INFORMATION SEEKING BEHAVIOUR OF VETERINARY PROFESSIONALS IN SOUTH INDIA

Thesis submitted to Pondicherry University
in partial fulfillment of the requirements for the award of the degree of

DOCTOR OF PHILOSOPHY
IN
LIBRARY AND INFORMATION SCIENCE

by

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CERTIFICATE

This is to certify that the thesis titled "**Information Seeking Behaviour of Veterinary Professionals in South India"** submitted to Pondicherry University in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy in **Library and Information Science**, is a bonafide record of research work carried out by **Mr. V. Srinivasan** under my guidance and supervision and no part of this thesis has been submitted for the award of any Degree / Diploma / Associateship / Fellowship or any similar titles before in this University or elsewhere.

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DECLARATION

I hereby declare that the thesis titled "**Information Seeking Behaviour of Veterinary Professionals in South India**" submitted to Pondicherry University in partial fulfillment of the requirement**s** for the award of the degree of Doctor of Philosophy in **Library and Information Science,** is a record of original research work carried out by me under the supervision of **Dr. R. Sevukan,** Associate Professor & Head, Department of Library and Information Science, Pondicherry University and that no part of this thesis has been submitted for the award of any Degree / Diploma / Associateship / Fellowship or any similar titles before in this University or elsewhere.

(V. Srinivasan)

Place: Puducherry

Date: 16.06.2016

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ABSTRACT

The present study was undertaken to examine the information needs and information seeking behaviour of veterinary professionals working in veterinary universities / colleges in South India (Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and the Union Territory of Puducherry). The study was also undertaken to evaluate the library services available to veterinary professionals. A total of fourteen veterinary institutes was surveyed and the population consisted of faculty, Ph.D research scholars and post graduate students. A standard / structured questionnaire was designed and distributed to 800 respondents personally / by post. Out of which, 678 respondents returned duly filled-in questionnaires indicating a response rate of 85%. To get the required information, questions were framed on personal data, general and clinical information needs, use of various information sources, role of university / college library in providing required information, constraints in accessing information, awareness of ICT tools, e-publications and databases. A punch code was developed for data entry into the computer in MS excel worksheet and analyzed with the SPSS statistical package (version 17.0). For data analysis, the variables viz. gender, age, educational qualifications, work place, experience and area of specialization were considered as independent variables, while general information needs, clinical information needs, problems encountered, computer literacy, use of internet, e-resources and databases were classified as dependent variables.

In analyzing various information needs of the respondents, information for updating 'subject knowledge' and for 'research and publications' were the most wanted needs (60% and 43% respectively) in the general information needs category, while in the clinical information needs, clinical signs, diagnosis, differential diagnosis and treatment were pegged at 47.6%, 53.7%, 45.7% and 52.2% respectively. In the assessment of awareness of various sources of information, it was observed that the formal sources of information were the most wanted, indicating the society's strong desire for print media. Among the non-print sources, television was preferred first followed by CDs and DVDs. However, it was observed that the online sources had started making a steady invasion as alternates for information channels. In assessment of time utilization, it was observed that respondents spent greater time at workplace for information retrieval with more number of respondents who desired to receive

information at ‘anytime’ in comparison to other time slots. With regard to dependence of professionals on various sources of information, free internet sources / open access sources predominately occupied the first place with 60.2% of respondents using this source always. This reveals that the internet is making massive inroads in source of data retrieval because of its many advantages. However, it was also found that 36.1% of respondents who were regularly purchasing latest edition of books on their specific subjects indicates that the print medium is still holding a strong place among all types of user community, besides many technological innovations. In the assessment of extent of use of library facilities by the respondents, it was observed that there was a significant difference ($p<0.05$) between faculty and Ph.D scholars, faculty and post graduate students with regard to usage of institutional libraries. Further, analysis of chi-square test revealed that there was no significant difference that exists between faculty and Ph.D scholars as well as Ph.D scholars and PG students with respect to usage of information for their research productivity. It was identified that ‘high cost of reading materials’ (both print and online) was the major problem / constraint for veterinary professionals followed by ‘lack of time’. Finally, in assessment of level of using information and communication technology based information services, it was noted that 99.4% of respondents were competent in using MS office and all were well versed with internet browsing. Also, online databases are gaining popularity among the sample studied. It was also interesting to note that 91% of the respondents have access to e-resources. Among e-databases, PubMed, Vet Science, and CAB Direct were the most used databases. Eventhough the PubMed is mainly for medical sciences, majority of veterinary professionals (56.2%) also prefer to use this database because of its wide coverage, free access and other merits. The availability of plenty of e-resources and its usage indicates that the veterinary institutes in South India are surging ahead in information and communication technology, and that funds are not a constraint in the development of these institutes to be global players in the cutting edge of science and technology.

Keywords: Information seeking behaviour, Information need, Veterinary professionals, Information search pattern, Information usage, ICT skills, Clinical information, Animal health, Animal welfare, Animal husbandry, Treatment, Livelihood, Rural economy.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
B.V.Sc. & A.H.	Bachelor in Veterinary Science & Animal Husbandry
CAS	Current Awareness Service
CD-ROM	Compact Disc Read Only Memory
CeRA	Consortium for e-Resources in Agriculture
CIMS	Current Index of Medical Specialists
COVAS	College of Veterinary and Animal Sciences
CSIR	Council of Scientific Industrial Research
CVSC	College of Veterinary Science
DVD	Digital Versatile Disc
FC&RI	Fisheries College & Research Institute
FTC	Farmers Training Centre
ICAR	Indian Council for Agricultural Research
ILL	Inter Library Loan
ISB	Information Seeking Behaviour
KVASU	Kerala Veterinary and Animal Sciences University
KVAFSU	Karnataka Veterinary, Animal and Fishery Sciences University
KVK	Kirishi Vigyan Kendra
MOSPI	Ministry of Statistics and Programme Implementation
MVC	Madras Veterinary College
MIMS	Monthly Index of Medical Specialists
MEDLARS	Medical Literature Analysis and Retrieval System
M.V.Sc.	Masters in Veterinary Science
NAIP	National Agricultural Innovation Project
NATP	National Agricultural Technology Project

NEIST	North East Institute of Science and Technology
NISSAT	National Information System for Science and Technology
NML	National Metallurgical Limited
ONGC	Oil & Natural Gas Commission
OPAC	Online Public Access Catalogue
PG	Post Graduate
RIVER	Rajiv Gandhi Institute of Veterinary Education and Research
R&D	Research & Development
SDI	Selective Dissemination of Service
SMS	Short Message Service
SPSS	Statistical Package for Social Sciences
SVVU	Sri Venkateswara Veterinary University
TANUVAS	Tamil Nadu Veterinary and Animal Sciences University
TVCC	Teaching Veterinary Clinical Complex
UG	Under Graduate
UGC	University Grants Commission
VCD	Video Compact Disc
VCI	Veterinary Council of India
VC&RI	Veterinary College & Research Institute

CHAPTER 1

INTRODUCTION

1.0 BACKGROUND

The 21st century is aptly termed the "Information Era" since the entire world is dependent on information irrespective of its educational status and needs. The importance of information further increases as human needs increase. The sources of information vary from media to paper to digital records. Information accumulation and retrieval therefore plays a significant role in day to day life both personal and professional alike.

The successful reorientation of the educational system and the scientific research can be achieved with "information". The various forms of information pave the path to success in the modern society.

Information is considered as one of the basic resources that are utilized by every human being for the development in their life. The world has witnessed many revolutions such as Green revolution, White revolution, Industrial revolution and now undergoing the Information revolution. Information provides knowledge and intelligence to the users. Information, wherever it is generated becomes useful only when it is accumulated in a standard format, organized methodically and distributed widely for the optimal use of the scholars. Information should be made available at right time and at right place without any barriers.

Witten, Cunningham, Vallabh, and Bell (1995) explained the necessity of the information in the present world. The changing scenario of information from paper to electronic media has brought changes in the research sector. Due to advent of computers and the technological innovations in the media sector has increased the use of the libraries in its modern form the "digital libraries". Thus researchers enjoy the benefits of these "digital libraries" when they search for their topic of research and its retrieval, from the storage facilities which are conveniently available to them at their door step.

Today, everyone should be information literate for selecting the information sources, adopting suitable information seeking strategies, capable of accessing information channels and verifying the reliability of information according to their needs and use the obtained information for solving their problems. Effective usage of information determines the level of satisfaction of the users on the fulfillment of their needs.

1.1 INFORMATION

Due to technological advancement, information has become a vital resource and its exact nature is not easily described. Information is gaining more importance in every phase of human life and has become an irreplaceable and powerful tool of the society.

Information is defined as ***"Information is recorded experience that is used in decision making"*** in literature and as a stimulus that reduces uncertainty by Shanon and Weaver (1963). Further reading defines information as a format of formal or informal communication of mind of all knowledge, idea, facts, data and imagination (Chen and Hernon, 1982). Webster's Third International Dictionary defines Information as –

- Facts or figures ready for communication or use as distinguished from incorporated in a formally organized branch of knowledge.
- The process by which the form of an object of knowledge is impressed upon the apprehending mind so as to bring about the state of knowing."

1.1.1 Significance of Information

Information is one of the essential components for all economic and social change in our society. The development of any sector in government or semi-government or private or individual greatly depends upon the availability and accessibility of information at the right time in adequate quality and quantity. There should be free flow and exchange of all types of information *viz.* scientific or technical or general without any problems. The information needs of various user-groups should be met by providing effective information services. Nowadays, user behaviour in gathering information, their various information requirements and

various channels of information dissemination and gaps in information supply have become major areas of research in user studies.

1.1.2 Types of Information

On the basis of use and purpose Shera (1972) categorized information into six types:

i. Conceptual information: It relates to ideas, theories and hypothesis and its relationship exists among the variables in the area of problems.

ii. Empirical information: It relates to data/ equations/ procedures drawn from experiments of research by oneself or communication from others.

iii. Procedural information: It relates to data/ results derived from an investigation. The results obtained from investigation should be tested.

iv. Stimulatory information: It relates to encouraged by oneself or environmentally supported.

v. Policy information: It relates to data which helps in decision making process.

vi. Directive information: It relates to the information used for coordination and helps the group to active effectively.

1.1.3 Qualities of Information

When possessed with the following basic qualities, such as i. Accessibility ii. Comprehensiveness iii. Precision / accuracy iv. Compatibility v. Timeliness vi. Clarity vii. Flexibility viii. Verifiability and ix. Quantifiable information becomes a valuable resource (Tague, 1976).

1.1.4 Sources of Information

Information is available in different sources and formats. There are varieties of documentary sources; such as primary, secondary and tertiary sources which the library and information centers have been dealing with since long time. Under the non-documentary sources there are institutional sources; under which different institutions, organizations etc. are categorized as sources of information. Individuals are also considered as one of the important non-documentary sources which may include; Colleagues, Peers, Consultants, Experts etc... Besides, sources of information

are also available on the internet based web sites where subject information is stored with help of multimedia technologies ranging from texts to audio, video files, sounds and animation files. Also e- resources cater to the needs of seekers in the form of CD-ROMs, DVDs, Pen-drives, Smart cards etc... and non print materials like microfilms and audio visual aids.

1.1.5 Users of Information

Users are the basic component of any information system and they are the real beneficiaries of end products generated by an information system. A library must be designed based on the users, the type of information they need and the ways to fulfill their needs. Without satisfying the users no information system will attain its goals.

Julien (1999) categorized information users into four groups as:

i. User ii. Client iii. Customer and iv. Patron

According to their nature of work users can be categorized as:

i. Lay people ii. Government servants iii. Educators iv. Students v. Researchers vi. Policy makers etc...

In the present era authors Bembem & Ibohal (2008), classified the professional categories of the digital library as:

i. Academicians ii. Researchers iii. Students iv. Authors v. Publishers vi. Scientists vii. Technologies viii. Aggregators ix. Academic Institutions x. R & D Organisations xi. Industrial Sectors xii. Similar others. These groups of users in a digital library are often termed as e-users.

The same authors further classified the social scientists as:

- ***Potential user:*** The needed information that can be provided by specific services.
- ***Expected user:*** A user is willing to use different information services.
- ***Actual user:*** Who needs information service irrespective of the benefits he may reap from it.
- ***Beneficiary user:*** Maximum advantage is drawn by the user from the services available for information**.**

These different categories amongst users have distinct behaviors while seeking information and have its own characteristics, requirements, behaviour pattern, different approach and limitations.

1.2 INFORMATION NEED

If one has to take the need for information and try to explain it as a concept, then the definition, isolation and measurement of "information need" become difficult. Hence, while relating to terms *viz.* requirement, want and demand a more prosaic approach via dictionary meanings may be analysed and ultimately arrive at the true synonym for "information need."

Line (1974) defined the term "Information need" as the needs of an individual based on his research, recreation and edification.

Kuhlthau (1993) while relating to "information need" describes it as a science of information that evolves from a vague awareness that something is missing and it culminates in finding that information which would finally contribute to the understanding and the meaning of the objective of the search. Further, going one step ahead Belkin et al. (1982) stated that "Need" is nothing but an "Anomalous State of Knowledge (ASK)". But, Dervin and Nilan (1986) defined that the information need is a lacunae in the knowledge of the individual in making sense during situations. Contrarily Wilson (1997) states it as a want of motive by a person searching for information.

As stated by Soper, (1990) "Information need" in the Thesaurus of the Librarian is defined as "that need which library services or materials are intended to satisfy"

1.3 INFORMATION SEEKING

Most of the human existence is substantiated by the notion of search; we seek and pursue for our all kinds of needs starts from our basic needs such as; food or clothing or shelter etc.

Likewise, search for information leads to a transformation in human beings where their quest results in change their level of knowledge. The term search will be used to denote the behavioural actions of humans engaged in information seeking and will also be used to explain the actions taken by computers to match and display information.

'Information seeking' is a term that denotes the various ways in which an individual learns to hunt for information, and then evaluate the material on need basis and uses it. This process of search for information proceeds on a path where the seeker may have to opt for interaction with people or use analog tools and computer based information systems to achieve his goal. Thus, Marchionini (1995) observes that the field of information seeking encompasses knowledge acquisition for a purpose or cognitive functions which in turn are related to learning and identification of problems and solving them or in some cases where the solution may or may not be arrived at.

In other words it could be described as a process that involves both adaptive and thoughtful controls which in turn controls the internal and external actions of the information seeker. The most highlighting factor in information seeking is that it forces people to try and understand a problem, arrive at some conceivable sense, under all situations whether they like it or not.

1.3.1 Definitions of Information Seeking

Marchionini (1997) described information seeking as a process undertaken by the humans on a purpose to change their knowledge status. This is a solution seeking methodology that involves the cyber world wherein the knowledge is gained through the various inputs and outputs depending on the situation or problem and their feedback.

The term Information seeking has been used in different ways by several people. It was discussed with concern as to how this term was used by the seekers by authors Kuhlthau (1993) and Chatman (1996). The term was contemplated by such researchers who presented their ideas about the process, learning and social relations that could change the process and interest of their research work.

The information seeking was emphasized (Kuhlthau, 1993) as a continuous procedure in which a seeker tries to solve a problem via thoughts and feelings and by understanding the situation. This mode of approach and action directed the researcher to seek the meaningful research in designing the methodology for improving information search.

Kuhlthau (1996) and Bates (1986) define information seeking as "Understanding the pattern of people information behaviour". They also declared that in order to arrive at the pattern of information behaviour of the people one must also take into consideration the diversity, ambiguity and intricacy of the information needs of the users.

Chatman (1996) concluded his observation on the note that people who engaged in research face barriers or constrains while seeking information for their research work.

1.4 INFORMATION SEEKING BEHAVIOUR

Information seeking refers to the process where collecting and retrieving information through published reading materials, consulting with contemporaries, etc. Behaviour on the other hand deals with the way in which it is carried out, how and from where the information is selected, the methods adopted for the search of information was carried, factors that influence user's approach, etc. (Kumar, 1990).

Information seeking behaviour can be described as mode of assembling the data by an individual and searching for various sources for required information for his personal use, and to further his knowledge in line with the recent updates.

Information seeking behaviour is the focused seeking of information for an effective result in order to reach or achieve ones' aim. The course of seeking information may be through personal interaction or via the computer based search engines (Wilson, 2000).

It means searching for information to satisfy the requirement for a task and its absolution. It is a rational course in which the users can perceive a need in their mind

in order to satisfy some goals. They retrieve information from various channels *viz.* library or information centre, cyber links or persons. It is the pattern of actions adopted in other words "behaviour" in response to assure the want for information. It is the complex pattern of actions and interactions which people engage in while seeking information of whatever kind and for whatever purpose (Ellis, 1989).

Krikelas (1983) stated that Information seeking behaviour is a result of recognition of some need. Any type of activity which is chosen by an individual to categorize a any significant information that satisfies the requirement of a seeker. In other words, information seeking begins when someone understands that there is lacunae in the present data collected and therefore needs reinforcement in information collection in order to deal with a problem and solve it.

1.5 INFORMATION SEEKING BEHAVIOUR MODELS

A model serves as an abstract tool, a flow chart of a multifaceted course of representing a hypothesis or theory. A model may be considered or defined as a systemic description of a phenomenon or a hypothesis in a three dimensional form or mathematical or computerized designs. These sort of scientific models are more frequently used in projecting scientific theories. It guides to understand complex events, to gain knowledge of difficult skills and afford the framework, the use of which may be inculcated in various studies to confirm the theories or hypothesis.

A model is an outline of thinking about a problem and establishes relationship among theoretical propositions. Many models of Information Seeking Behaviour have been formulated, and significant ones among them are taken into consideration for discussion in the following paragraphs.

1.5.1 Wilson's Model of Information Behaviour (1981)

Wilson's model of information seeking behaviour deals with the concepts of information need, information seeking, information use and information exchange interrelating between the seeker and his behaviour in the search for information (Figure 1.1). The depiction is debated for the present study.

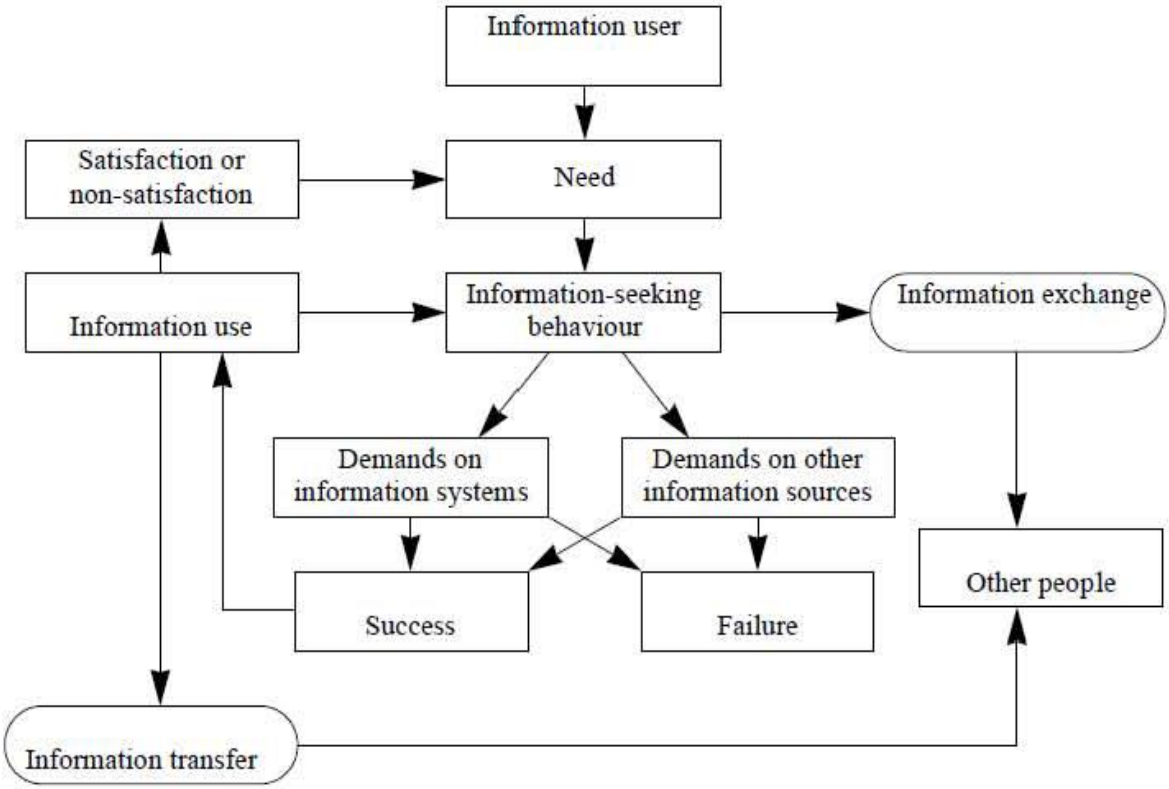


Fig. 1.1: Wilson's (1981) model of Information Behaviour
(Source: Sodhganga – INFLIBNET)

From Figure 1.1, one can arrive at a conclusion that it is suggestive of the fact that need is the main driving force behind information seeking**.** The user makes use of various sources or services in order to suit the need the outcome of which may be an achievement or a failure in finding appropriate data. In the event of finding the relevant data, the individual uses it and if he is not satisfied he may have to redo the process. In this process the user may involve other people also through information transfer. If information received is useful it may be made available for the others to use it.

The model explains the ways and means of the beginning of information needs and the elements that may hinder the search for information. A need based test was undertaken to ascertain the assumptions included in this model.

1.5.2 Wilson's Model of Information Seeking Behaviour (1996)

In 1996, Wilson expanded his earlier 1981 model after conducting research in various fields other than information science, *viz.* psychology, resolution - making theory, health, communication and consumer research. Wilson suggests that alternative models also address similar issues and the models are complimentary to each other. The Ellis's behaviour model is a set of activities, termed as "collection" in Kuhlthau and these models are grouped within Wilson's 1996 model of information seeking behaviour in general.

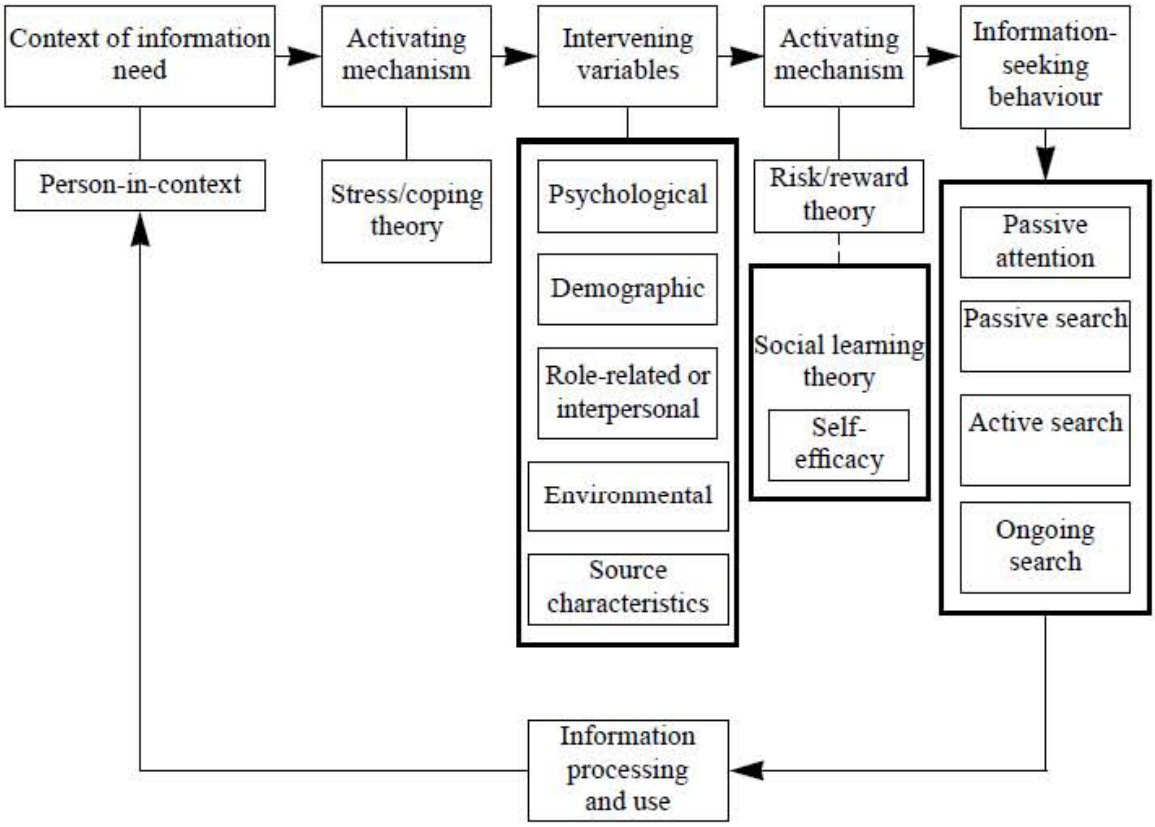


Fig. 1.2: Wilson's (1996) model of Information Seeking Behaviour
(Source: Sodhganga – INFLIBNET)

This model was updated and designed on the basis of 1981 model. The person who is searching for information remains the focus of information needs. In this model barriers are identified as prevailing variables and its impact may be 'supportive' or 'preventive'. The behavioural theories explain the factors that motivate information seeking behaviour.

Stress/coping theory suggests that the information needs of individuals engaged in seeking activities are high and their work is affected due to lack of knowledge. This inadvertently increases motivational level of the seeker who aims to cope with the stress to overcome the lacunae in knowledge as he engages in information seeking.

The risk/reward theory says that why in some situations individuals seek information and in some situations they do not and why some information sources are more frequently used than others.

Social learning theory, which includes the concept of 'self-efficacy' which means "the dedication that an individual can successfully execute the behaviour required to produce the desired out comes".

1.5.3 Dervin's Sense Making Theory

The theory of sense making has been developed over years by Dervin**.** It is not only a model but also a set of assumptions, a systematic approach, a set of research procedures and a practice designed to cope with information perceived as ' a human tool developed for making sense of reality expected to be both chaotic or orderly'. This theory was framed with the help of four constituent elements like;

- ***Time and space*****:** The time defines the situation in which information need arise
- ***Space:*** Deigned as the gap that deals with the difference between the appropriate situation and the preferred situation;
- ***Outcome:*** The result of logical course taken/sense making process, and
- ***Bridge:*** The means adopted to close the void that arises between the circumstances and the results.

Dervin grouped these elements in terms of a triangle as represented in the figure below:

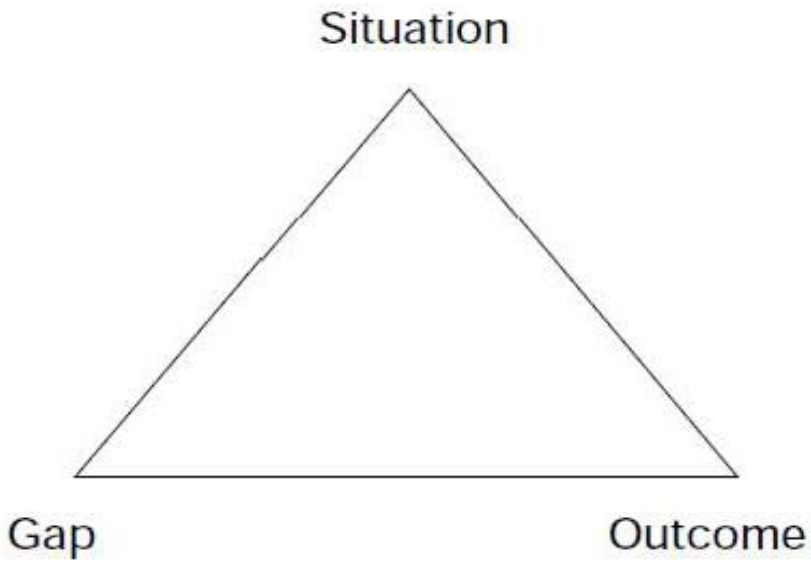


Fig. 1.3: Dervin's (1983) Sense Making Framework
(Source: Sodhganga – INFLIBNET)

Improvising of the model presented earlier in 1983, another model was suggested wherein the constituent "bridge" symbol was applied directly and the following model was arrived at to explain the theory of Sense making.

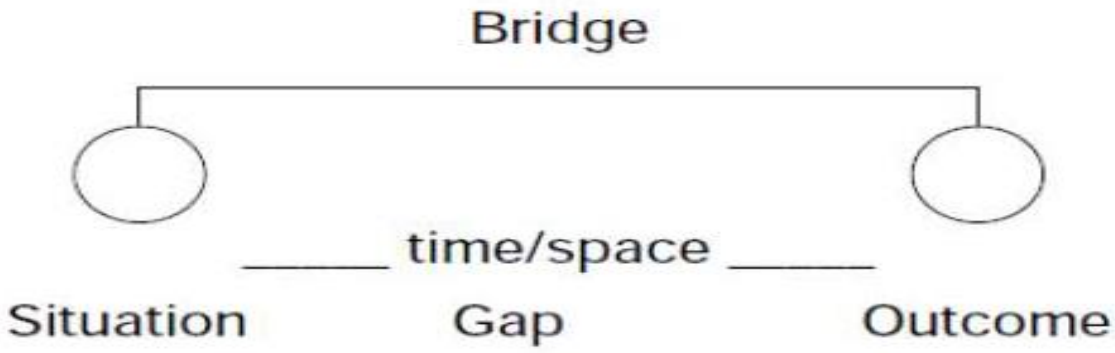


Fig. 1.4: Dervin's (1996) Sense Making Framework Modified
(Source: Sodhganga – INFLIBNET)

1.5.4 Kuhlthau's Model of Information Seeking Behaviour

Taking into consideration the various stages that are involved in behaviour of information seeking, a model that includes six major behavioural stages was evolved by Kuhlthau in his studies. The stages involved are discussed herein:

i. ***Task initiation:*** taking a decision for selecting a topic
ii. ***Topic selection:*** choose an area/ topic for research
iii. ***Pre focus exploration:*** Aspire to find a focus through explorative information
iv. ***Focus formulation:*** create focus from the information encountered
v. ***Information collection:*** collecting information to identify, broaden and sustain focus
vi. ***Search closure:*** wrap up the search for information

Eventhough Kuhlthau did not claim her model to be linear, she designed the model as stages based on her analysis of behaviour. She also included the feelings, tasks, thoughts and actions connected with each stage. For example, at 'initiation' stage an individual understands his lack of knowledge and manner of uncertainty about a problem. At this stage the task is to recognize a need for information. Thoughts center on analyzing the quandary and relating the dilemma with former incident and comprehension. Measures entail discussing probable topics and solutions.

Ellis did not present the factors in his model as stages, but rather principles of an information seeking process that is diversified in varying degrees of categories depending upon the type and nature of the seekers who in turn are influenced by time and need. Ellis also stated that the order of behaviour in his model may vary. Thus, Ellis presented his model with much more focus on the way of approach while dealing with an assortment of stages and actions when compared to that of the model presented by Kuhlthau which is more generalized in its approach.

1.5.5 Ellis (1989) Model of Information Seeking Behaviour

Earlier studies on information seeking behaviour in social sciences mainly focused on the types of resources social scientists use, and the tools used to obtain them. They give more importance on the types of materials required (e.g. books vs. articles, English vs. Foreign language materials) rather than constructing models of information seeking behaviour.

Designing a different platform, David Ellis was the first in the process of information seeking behaviour of social scientists, how they search for information and dealing with the materials, as opposed to the sources they use and the ways through which materials are obtained.

Ellis (1989) model is based on the "perceptions of academic social scientists of their own information seeking activities, from their point of view and as a whole". He explains eight basic distinctiveness of information seeking used by social scientists, as shown in Fig. 1.5. They are:

i. ***Starting:*** Relates to the initiation of information seeking by the individual. The mode of action involves locating the references from earlier resources or from other sites that may provide pertinent data. Starting activities include discussing with colleagues or consulting related literature, indexes, abstracts and online catalogues.

ii. ***Chaining:*** Denotes 'chains' of citations which is correlated between resources during initialization of search. This correlation or "chaining" may be either forward or backward. The latter refers to the references from primary sources that are followed; whereas the former refers to additional sources that pass on to an original basis of document (e.g. citation indexes) (or) following footnotes and citations in known material.

iii. ***Browsing:*** Refers to an informal way searching for information in the field of concern. It includes browsing of published journals, table of contents and references and abstracts from the earlier published literature searches (or) semi directed searching.

iv. ***Differentiating:*** Deals with the use of acknowledged differences (e.g. author and journal patterns) as a way of selecting information from the data accumulated earlier by the individual.

v. ***Monitoring:*** Closely viewing the progress by following selected sources (e.g. news papers, journals, conferences, books and magazines) or current awareness searching.

vi. ***Extracting:*** Activities concerned with selecting a particular resource and distinguish the relevant material suitable for the work (e.g. journals, monographs, indexes, bibliographies, online databases etc.).

vii. ***Verifying:*** Measuring the accuracy of information which is obtained.

viii. ***Ending:*** Taking up a final thorough search to tie up all the loose ends.

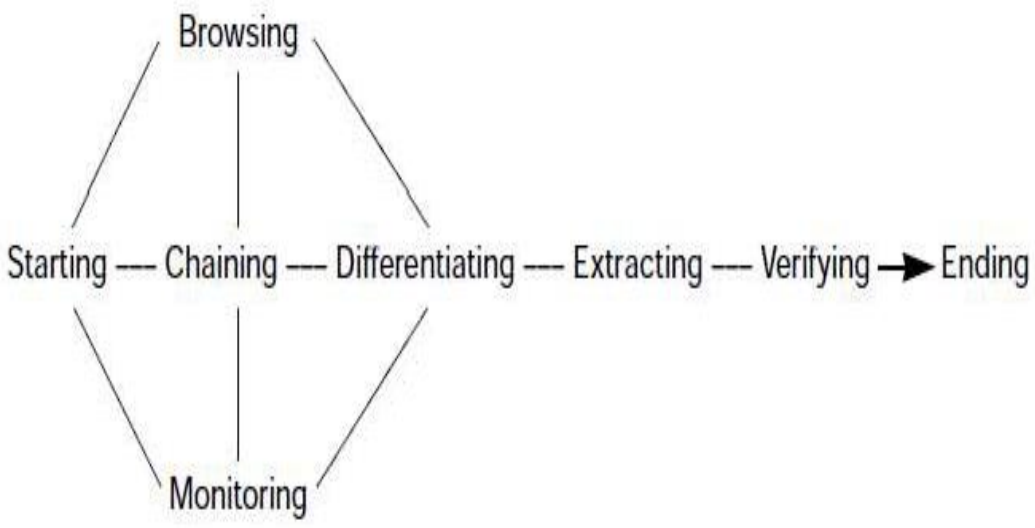


Fig. 1.5: Ellis (1989) Model of Information Seeking Behaviour
(Source: Sodhganga – INFLIBNET)

Further, Ellis clarified the need for flexibility in his model owing to the fact that the prototype of searching for information is highly variable. He attributes the variability to the characteristic of the individual which therefore requires a study that should be planned to establish a flexible information retrieval system.

Ellis Model in Web Environment

The Ellis model included number of information seeking methods normally accessible through internet surfing. Upon browsing the Web the net surfer begins from his favourite page and proceeds further on with the help of hyper textual links to find the needed information sources – in both backward and forward linking instructions (chaining); Scanning the web pages of the sources preferred (browsing); bookmark or identifying helpful sources for prospective mention (differentiating); subscribe to e-mail facilitated services that updates the client with innovative information (monitoring); and search a specific source or site for all information on a precise topic (extracting). It is noteworthy that the Ellis model is found useful even today for both print sources and web sources of information.

1.5.6 Gorman (1995) Model of Information Seeking Behaviour in Primary Care

Gorman developed a model for doctors who are serving in primary health centers. Gorman emphasized that the main activity of clinicians is patient care. Information obtained is related or sometimes unnecessary. The clinician begins in a state of unrecognized information need. This model describes information need of clinicians based on some strategies.

Every clinician wishes to keep himself abreast of developments occurring and evolving body of medical knowledge. However, when a specific patient problem arises, the clinician has no way to predict which kind specific information needs will occur next. Once confronted with a patient problem, the clinician becomes aware that he does not possess information required to solve the problem, then a state of recognized information need has developed.

The most commonly employed strategy is dealing with an information need once it has been recognized. Another strategy is deferral; when a patient's problem is not so serious nor treatment so urgent, the best decision is 'watchful waiting'.

Another frequent strategy is referral; sending the patient to a specialist who will assume the management of the patient necessitates the primary care clinician need to pursue information.

The dominant strategy is dealing with patient's problem with information available at hand and the clinician makes the best judgments out of it, which happens in most of the cases every day. It can be based on their knowledge and experience with similar cases treated earlier.

1.6 CURRENT SCENARIO IN INFORMATION SEEKING BEHAVIOUR

Information seeking behaviour starts with acknowledgment of some need, professed by the user. During the course of action the user may make use of recognized structures, like libraries, information centers, online services etc. Recently, a shift in the pattern of information seeking behaviour in researchers has been observed.

Nowadays, information seeking behaviour is a process of gathering information to fill the gap in the existing knowledge through electronic based tools like internet – world wide web (WWW), e-mail communication, search engines, online databases etc. Users should be aware of their known and unknown items. They use different e-resources through various modes to fulfill their information needs in this digital era. They use internet for many reasons, i.e. access to e-journals, downloading articles, e-services, chatting, discussion, entry to online public access catalogue (OPAC), and online subject / general databases using search engines such as, Google scholar, Yahoo, MSN, etc. to satisfy their information needs.

Users can access the digital resources information at any time, any place at minimal cost with high speed and accuracy. With the use of digital resources, the quality of information services can be maintained. While searching the information in the electronic sources there are no cases of missing or stealing of information occurs. Nowadays, large volumes of data and digital resources can be stored as compared to that of print resources in the past.

Due to the technological advancements scientists or researchers can search the OPAC and can request for inter library loan services from other libraries at their desktop. Internet provides tools to support searching on the World Wide Web, with the help of search engines and the scientists use HTML and HTTP through internet for scholarly communication through: i) E-mail ii) E-journal iii) E-book iv) Data bank vi) Virtual libraries vii) Academic web sites and websites of other research institutions, etc.

1.7 ROLE OF INTERNET AND OTHER TECHNOLOGIES

Niu et al. (2010) stated that at the beginning of 1990s, the arrival of personal computers and the Internet followed by the launching of online electronic reading materials lead to the improvement of educational research combined with swapping of erudite communication. The simplicity of the right to use electronic resources has made it easier for researchers to retrieve and share scientific information. Today, the use of online electronic resources has become ubiquitous in all fields of scientific research. However, the impacts of these technological advancements differ greatly among educational institutions throughout the globe.

Digital libraries may be defined as those unique libraries that are equipped with a assortment of digital items that include manuscript, visual material, audio material, video material, stored as electronic media formats (as opposed to print, microform, or other media), along with means for categorizing, amassing, and retrieving the files. The substance of digital libraries comprises of data, metadata that portray a range of features of the data (e.g., representation, creator, owner, reproduction rights) whether internal or external to the digital library.

Digital libraries are established to provide information to the user community, where the individuals and groups work together or collaborate with each other, by means of exchanging data, information, and knowledge resources and systems. Digital libraries act as consortium for a variety of institutions located at different places, where resources are chosen, composed ordered, preserved, and accessed for a user community. These institutions include, libraries, museums, archives, and schools, but digital libraries also extend and serve other community settings, including classrooms, offices, laboratories, homes, and public places (Borgman et al., 2005).

1.8 TRANSITION TO ELECTRONIC COMMUNICATIONS

The remarkable swing towards electronic communication of scholarly information that occurred during the period of 1980s and 1990s with overall implementation of Web-based an electronic journal was the basic driving force for change. The electronic circulation of articles came more in vogue due to rapidly increasing cost of journal subscriptions and decreasing academic library budgets.

An additional attracting reason for the of e-articles has been effortlessness of discovery of articles on the web via free search engines such as Google scholar or from library sponsored links in subscribed databases. The consequence is that probing, retrieving and analysis of scientific academic exchanges appear to be moving towards completely electronic. The shift to electronic communication has created a more prospective and credible ways of communication between scholars. Consequently, the ease at which the scholar could get an access to the relevant material of his search via electronic material, the rapidity of his communicating ability and the proficiency with which he could amass the materials for his research have all been augmented due to the digital media.

Thus the introduction of electronic communications in learning has led to total revamping of all disciplines of study, owing to scientists' urge to correspond the outcomes of their work quickly, their easy acceptance of technology and their support for digital content sources / databases (Hemminger, Lu, Vaughan, and Adams, 2007).

Researches in the field of science and medicine are becoming hectic with mounting magnitude of scholarly communication and simultaneously have to deal with multifarious collection of content delivery sources, such as books, journal articles, technical reports, web pages, scientific databases etc, with the consequence that the methodology of seeking for material its retrieval and scrutiny are continuously shifting. With the acceptance of the e-media database usage by the researches the excellence and the user-friendliness has enhanced. Therefore, the natures of gathering references by the scholars have now entirely entered the new phase of electronic media (Tenopir, King, and Bush, 2004).

Researchers are well versed with amassing collections of electronic articles as they had done with printed copies of articles. Simultaneously, the types of materials used by researchers are altering and increasing due to the effortlessness of electronic access to any type of digital material.

In a networked environment, scientists have many ways to find information in the published literature, from online bibliographic references to the informal e-mail distribution of article links between colleagues.

Davis (2004) concludes that the sequel of information seeking behaviour of scientists has immense significance not only to libraries, which splurge substantial funds for obtaining the search tools for the literature. This also takes into consideration the publishers, who invest in the technological infrastructure to make their electronic resources available.

1.9 INFORMATION SEEKING BEHAVIOUR OF VARIOUS PROFESSIONALS

Specifically dealt, one could discourse the nature of, information science research as that part of science that deals with the way human beings create, search, retrieve and use information. In this process individuals interact with information systems that now include the web (Spink, 2000). In the early 1980s, the library and information science researchers involved themselves in the need for, and use of information, extended their research to other types of professionals, aiming at an improved understanding and analysis of information seeking processes with varied environments. In particular, researchers arrived at the answers to the issues, including the parallels and divergence of information seeking behaviour amongst professionals.

Pinelli (1991) mentioned five institutional variables that clarifies differences between individuals in their use of scientific and technical information: type of user (engineer or scientist), nature of discipline (basic or applied), state of problem completeness, type of institution (academia, government, or industry), and years of professional experience. However, Leekie, Pettigrew, and Sylvain (1996) took into consideration the other variables age, career stage, and area of specialization while discussing the individuals' information seeking behaviour.

Science tries to understand the world in connection with man; the natural features of land, water, space, matter, energy, and their interrelationships. The basic task of scientists is to create, generate, or produce new knowledge, which is the result of research. Scientific research is based on hypothetical statements which are subjected to experimental testing for confirmation or negation (Yitzhaki & Hammershlag, 2004).

Technology, which includes engineering, is a compilation of logical knowledge, combined with industrial processes, which can be used in recurring actions. Engineers likely to provide practical solutions to problems, applying objective knowledge to create new products or services, using various tools and techniques based upon the designs and programs developed by them (Kennedy, Pinelli, Barclay, & Bishop, 1997).

Some researchers make a distinction between scientists and engineers according to their goals; the engineers' aim to be more consistent with those of their working industry. Technological achievements are necessary for attaining corporate goals and increasing occupational capacity of the engineer within the industry. However, scientists intend to publish their research findings, sharing the knowledge or innovations, and establish their professional status in their respective fields.

Vincenti (1990) narrated that scientists use information to create new theory and apply the same in their research and tries to establish that their research is innovative, different, and updates existing knowledge. As the work proceeds, scientists need further information to prove the hypothesis where their first level of results forms the basis for the second stage of action/experimentation.

Engineers need information to make decisions, and their basic aim is to produce or design a physical product, process, or system, rather than contributing original research to their professional literature. When engineers generate information, their main aim is to support their industry or to help others in their industry that may face the same problem when producing another product.

Medical scientists consider research articles as their most preferred source of information for their research and for delivering lectures. The sources of information may vary according to their tasks; different work roles require different sources of information (Landry, 2006).

Solomon (2005) stated that a mission is a basic force that manipulates people to select sources, discover information from the sources, evaluate information so discovered in relation to the goal, and gain new insights for attaining the goal.

It is clear from the above statements that the scientists and engineers have the difficult task of choosing from colossal and varied information sources and making efficient use of such sources.

The various methods of information seeking and use are essential components of scientific and technological progress. By offering new avenues for tracing, hoarding and propagating information, electronic technology has revolutionized the entire concept of communication for Research and Development (R & D) in the field of science and technology (Yitzhaki & Hammershlag, 2004).

1.10 NEED FOR THE STUDY

Veterinary professionals play a vital role in the development of nation as well as maintaining and enhancing health and welfare of animals. They constitute an important component of the users' community of library and information centres. The advent of electronic media such as, Television, Internet, Mobile learning technology, Computers, Electronic reading materials like e-journals, e-books, e-databases etc. in education and research institutions have influenced much in increasing and sharpening the reading habits of any type of professionals including veterinary professionals.

In this current scenario it is necessary to study the veterinary professionals' information needs, level of awareness about electronic information services, search patterns, use of various sources, and their skills in using and retrieving information in information and communication technology (ICT) enabled environment. On the other

hand, libraries and information centres also affected by adapting electronic technologies to expand and disseminate its services. The success or failure of any library depends on in providing tailor made services to its users. The findings of this study can facilitate the library professionals to redesign its services to deliver it in a more effective way towards fulfilling the needs of the users.

1.11 STATEMENT OF THE PROBLEM

The present research examines the information needs and information seeking behaviour of Veterinary professionals working in Veterinary Universities / Colleges in South India embracing Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and Puducherry states.

Title of the present study is "Information Seeking Behaviour of Veterinary Professionals in South India". The study focuses on to find out various information needs of veterinary professionals, their strategies in information seeking process, their level of efficiency in retrieving information in web environment, their skills in using ICT tools, and level of dependency on their library services. The study also evaluates the library services available to the veterinary professionals working in the institutions under study.

1.12 OBJECTIVES OF THE STUDY

The general objectives of research, on user studies are to promote understanding of users' needs and behaviour in information seeking. The following are the major objectives of the study:

1. To analyze different information needs of the respondents.
2. To assess the awareness of the respondents on various sources of information available in Veterinary sciences.
3. To study the pattern of information search, time utilized and acquiring the desired information by the respondents.
4. To examine the nature and type of the information sources preferred by Veterinary professionals.
5. To know the extent of dependence of professionals on various sources of information for getting relevant information.

6. To analyze the extent of use of library facilities and services available in the selected institutions.
7. To trace the extent of professional activities and achievements made by the Veterinary professionals irrespective of their academic positions.
8. To assess the level of awareness and utilization of ICT (Information, and communication technology) based information sources related to Veterinary sciences.
9. To suggest some rational measures for libraries for effective dissemination of information based on the outcomes of the study.

1.13 RESEARCH HYPOTHESES

The following were hypotheses formulated for testing for this study:

1. There is a difference among the scientists of various states with respect to nature and type of information requirements.
2. There is a difference exists among the professionals working in various states with respect to their duration of time spent in search of information.
3. There is a difference among the professionals of various states with respect to extent of dependence on various sources of information.
4. There are institutional variations among the scientists of various states in the use of library facilities / services.
5. There is a difference among the scientists with regard to their academic position and the research productivity.

1.14 OPERATIONAL TERMINOLOGIES

- **Information:** Facts or figures or ideas or data ready for communication
- **Facts:** Things that happen true or exist
- **Data:** A collection of facts, languages, mathematical or other symbols which represent the concepts or events.
- **Knowledge:** It is an organized set of statements of facts or ideas representing skills acquired by a person through education or experience.
- **Information Need:** It is a situation where an individual 'recognizes the existence of uncertainty' or whenever people find themselves in situations that require some form of knowledge for resolution.

- **Information Seeking:** Deals with the way of acquiring knowledge and its enhancement.
- **Information Seeking Behaviour:** Any activity of an individual that is undertaken to identify a message that satisfies a perceived need.
- **Veterinary:** An art relating to treating diseases of animals
- **Professional:** One who makes a living by practicing an art or craft.
- **Veterinary Professional:** An individual makes his living by practicing an art of treating diseases of animals.

1.15 CHAPTERIZATION SCHEME

The thesis has been organized into the following seven chapters:

The **First Chapter** introduces the basic concepts of information seeking behaviour, definitions, the nature of information needs of Veterinary professionals and their problems in getting required information along with their role in national development. It also includes Need for the study, Statement of the problem, Objectives of the study and Research hypotheses.

The **Second Chapter** summarizes the results of the previous studies conducted on this area of research.

The **Third Chapter** briefs selection of samples, research design, methodology, study variables etc.

The **Fourth Chapter** narrates the institutions under study, its objectives, functions and library facilities available (Profile of the institutions).

The **Fifth Chapter** provides the results of data analyses and their interpretations.

The **Sixth Chapter** provides a detailed discussion on the results of the data analysis with earlier studies.

The **Seventh Chapter** highlights the findings, suggestions for providing tailor-made services to veterinary professionals along with conclusions based on the results and discussion presented. This chapter also provides areas for further research.

CHAPTER 2

REVIEW OF LITERATURE

2.0 INTRODUCTION

Adequate familiarity with the studies which have already been conducted is a pre-requisite for pursuing any research work. It is necessary to understand how the researchers had approached the concept and what results they had obtained. Here, an attempt has been made to review the relevant studies / linked topics which make up the study in the area of information seeking behaviour. The relevant studies have been clustered thematically and presented below:

2.1 INFORMATION SEEKING BEHAVIOUR OF STUDENTS

Many studies on information seeking behaviour of students in colleges and universities have been carried out starting from 1980s. Of which, a few most relevant studies are summarized.

Kakai, Ikoja-Odongo, and Kigongo-Bukenya (2004) described information seeking behaviour as an individual's way and manner in which the information is collected for personal use, knowledge updating and development. A case study conducted by them revealed that the respondents need information which includes for course work and assignments, preparation for examinations and tests, general reading to enhance lecture notes and class- group discussions. The students ranked 'lecture notes and handouts' as most preferred followed by using departmental Book Banks and then the university library. The respondents revealed that the textbooks were the most heavily used source among the library information sources followed by theses/ dissertations, reference materials, newspapers, etc. It was further established from the findings that students have information needs that relate to their studies. The interview with their teachers confirmed that the students prefer having lecture notes rather than searching and preparing notes on their own. The undergraduate students were also found to rely mainly on textbooks, with very little use of other information resources like journals (both print and electronic) and CD-ROMs. This may be due to lack of knowledge on their value and use or about their availability. It was noticed that a lot is desired in the way the students seek information, exposure to more

information resources and individual vigilance while exhaustively looking for the required information. Training students to seek information using a variety of sources and sharing information between them was necessary.

A survey conducted by Qureshi, Iqbal, and Khan (2008) found that out of independent variables taken up for the study, highest correlation existed between 'surrounding environment' and 'awareness of resources' indicating that if surrounding environment is helpful then it creates desired knowledge and curiosity towards awareness of resources. They also observed a correlation (0.41) between student participation and awareness of resources and a highest correlation between 'educational and cultural background' and 'students information needs and seeking behaviour'. In addition, a strong correlation between 'information needs behaviour' and 'information seeking behaviour' was also reported. Regression analysis confirmed the results of correlation studies. Finally, they concluded that there are several factors that have significant and positive effect on students' behaviour among these, the leading factors were 1. educational and cultural background and 2. surrounding environment and student participation.

Zhang and Chignell (2001) identified a set of findings which include a) a considerable number of graduate students in educational administration were lacking library research and internet research knowledge skills b) internet resources could only supplement, but not replace, print resources for academic information c) journals and magazines were the number one preferred source of academic information and d) fellow students in the academic information were the most frequently used human source for academic related information. Further, 'relevant to the problem' and 'near at hand' were ranked the top two academic information characteristics. The study concluded with recommendations pertaining to library and internet instruction under the concerned department, possible curriculum modifications and the necessity for individual students to take initiatives in their academic information seeking.

Fatima and Ahmad (2008) reported that majority of users (51.6%) were visiting the library daily and 31.67% of users visited 2 to 3 times a week. They also found that 78.33% users visited the library to study, 71.66% to borrow books, 65% for browsing the shelves, 30% to use reference materials, 36.66% to read journals and

85% to read newspapers and magazines. With regard to use of library sources and services, it was observed that majority of the students used newspapers followed by the use of books and journals. It was also found that information services such as CAS, SDI and abstracting services were marginally used and translation service was unavailable. Career development ranked first for the purpose of information seeking followed by problem solving, keeping up-to-date and the need to write article or research paper. 93% of the respondents agreed with the statement that for more effective and efficient use of the library, students need instruction on how to use information sources in their subject areas. This finding was similar to those of Lubans (1971) and Holland and Powell (1995) which indicated that graduate students need instruction on the use of the library to enable them to make more effective and efficient use of information sources and services. They concluded that student oriented information resources such as text books, reference material, journals, internet facility, database etc., should be facilitated. Importantly, the library should provide initial orientation workshops and ongoing seminars for students to train them in using resources so that utilization of resources and services is maximized.

Makani and Shue (2006) showed that the students were likely to search Google or another similar search engine as the initial step in their information seeking process. In terms of communication modes, the participants relied primarily on e-mail for communicating and sharing information with their teachers and other experts. The students noted a number of shortcomings associated with e-mail (e.g. slow response times) which accounted for their significant use of other communication modes, namely telephone, instant messaging (chat) and discussion forums. The study results also revealed that students tend to select resources based on cost (free or for fee), accessibility, ease of use, speed of delivery (of results), and convenience. When asked about the usefulness of potential digital library functionalities, students valued a personalized user interface and communal virtual spaces that would allow the students to share information and communicate in real-time with their peers.

Harinarayana, Vasantha, and Swamy (2008) reported that majority of the users visit the libraries for borrowing books and text book service was most highly sought after service. The libraries were lagging behind in providing specific information services like SDI, CAS, Bibliography, etc.

Sharma, Das, and Das (2008) analyzed the functioning of Engineering college libraries in Orissa. They found that there is a growing dissatisfaction among users arising from non-availability of needed documents and that lack of services could be reduced to some extent by providing current awareness services and information about latest addition to users.

Biradar, Dharanikumar, and Mahesh (2009) viewed that a majority of the students visited the library to read journals and magazines, to borrow books and to read newspapers to prepare assignments and to improve general knowledge. The analysis revealed that the students are more interested in reading books, newspapers and journals. Only 13.86% of students visited the library for recreational purpose and 4.95% respondents visited the library for internet browsing. Perhaps the low turnout for internet browsing would be the low speed of internet connectivity. With regard to frequency of use of information sources available in the library, there was a marked preference for books followed by periodicals. It was also observed that almost all reference sources *viz.* dictionary, yearbooks, encyclopedias, gazetteers and handbooks were being consulted by the users occasionally. The analysis revealed that 72.27% of respondents used lending services, among them 54.79% were satisfied and 23.28% were partially satisfied with the service. 79% of respondents made use of reference service of which 57.5% were satisfied and 20% were fully satisfied. 70% of respondents made use of current awareness service and among them 51.42% were satisfied with the service. Non-documentary sources were less used perhaps owing to lack of awareness or inconvenience in use of these resources. There was an urgent need of establishing e-consortia model among the Agricultural Sciences' libraries in India and also information literacy programs.

Arokyamary and Ramasesh (2009) made an attempt to study on foreign students' information needs and information seeking patterns in the University of Mysore. The foreign students relied upon the library and internet facilities mainly to prepare themselves for academic studies like seminars, examinations, tests and assignment preparations. Foreign students found it easier to track up-to-date information available on the web. Since a major segment of the students possessed internet facility at their residence, they found it easier to be familiar in respect of locating information for academic endeavours. They analyzed that the library

collection, especially relating to textbooks and reference collections including the report literature were out-dated to an extent of 25% to 50 % and there was a need to update these collections on priority basis. A great majority of the foreign students availed internet facility in order to send / receive e-mails and access to electronic books and journals. They also found that quite a number of students were of the opinion that they were efficient in using library services including internet facility and as such there was no need for formal training or orientation. They concluded that the foreign students who approached the university with a lot of expectations, necessitate that the library should strengthen its reference collection and textbooks collection and subscriptions to core journals; printing and electronic media facilities have to be made available based on the needs of the user community.

Halder, Ray, and Chakrabarty (2010) explored the influence of personality factors on the information seeking behaviour of university students in West Bengal. They found that gender (male / female) was an influencing variable in information seeking process and better understanding about the human behaviour would help in disseminating information services effectively. They observed significant differences between males and females in information search process, females have scored high than males in most of the information search queries / domains.

2.2 INFORMATION SEEKING BEHAVIOUR OF RESEARCH SCHOLARS

Ucak and Kurbanoglu (1998) identified major differences in the need and information seeking behaviour among the members of major disciplines. The greatest differences which they observed were between scholars from Engineering and Humanities disciplines. Scientific conferences and meetings provided the major platform for the acquisition of informal information through discussions with colleagues. While the engineers and scientists' preferred current information provided by periodicals, opposite is true for the humanities scholars who satisfy their needs mostly through books. Social scientists, on the other hand, preferred books to periodicals, but they also followed periodicals much more than the humanities scholars. The scientists and engineers utilize the electronic retrieval systems much more than their colleagues in other disciplines. The major complaint of the participants in their survey was that they could not locate the materials they were

seeking at their library and all expressed a desire for the continuation of interlibrary loan services. An interesting finding in their study was that given the choice, scientists and engineers prefer to read the original article, where as social scientists and humanities scholars seem to prefer those texts translated into Turkish even though they can read and understand the paper in its original form. They also recommended a user education program tailored to the needs of each discipline, keeping in mind the different channels and sources available to the librarians.

Haines, Light, O'Malley, and Delwiche (2010) studied the information seeking behaviour of basic science researchers. They found that the basic science researchers used a variety of information resources ranging from popular Internet search engines to highly technical databases. The researchers generally relied on basic keyword searching, using simple interface of a database or search engine.

Kumar (2010) conducted an analytical study on the information seeking behaviour among Agricultural scientists. His study revealed that most of the scientists need information for general awareness, class room lectures, research work and new updates in their profession. The majority of scientists prefer current and factual information and information on research and development. Among the formal sources respondents prefer journals, textbooks, research reports and dissertations. Among the e-resources internet usage, e-mail services and e-journals were mostly used. Further, the study highlighted that majority of agricultural scientists visit their library frequently, consult library staff to locate the relevant reading materials and revealed that the location of the library was convenient to them. However, only a few scientists stated that they were fully satisfied with the resources services of their library. Finally, the study also stated that the information seeking behaviour of agricultural scientists were diversified in nature.

Lorica (2011) emphasized the necessity of information seeking behaviour which enables the social science scholars in planning, developing and implementing information systems.

Jamali and Nicholas (2011) evaluated the information seeking behaviour of Ph.D., scholars of Physics and Astronomy at the University College, London. The findings showed that the subfields that are more interdisciplinary or have a widely scattered literature were more likely to use general search facilities for finding information. The study also showed that cross-disciplinary use of the literature was not necessarily an indicator of scattered literature. The study also revealed interdisciplinary differences among physicists and astronomers in terms of their information seeking behaviour and concluded that there is a possibility of overlooking the characteristics of information seeking behaviour of specialized subject communities.

Al-Suqri (2011) analyzed that the information seeking behaviour follows universally applicable stages, and that the model can be applied to current-day information seeking despite changes in the information environment. The model should be developed in such a way to include additional dimensions relating to the format and location of information resources, since these factors have an important influence on the process of information seeking among the study participants.

2.3 INFORMATION SEEKING BEHAVIOUR OF FACULTY MEMBERS IN UNIVERSITIES / INSTITUTES

Thornton (2000) found that consortia have become most important source in electronic information world. With the advent of the Internet and the ability to simultaneously share virtual resources through consortia, the monopoly of local library will reduce and the roles of librarians will change drastically.

Majid and Kassim (2000) have reported that adequate knowledge about information needs and seeking behaviour of users was vital for developing library collections, services and facilities to meet information needs successfully.

Rogers (2001) studied the frequency of use of electronic resources and printed journals at Ohio State University. The study witnessed the increased use of electronic journals and decreased use of printed journals by the respondents. The study also pointed out that there was no correlation between age and frequency of use of

electronic resources and there was significant progress in the acceptance and use of electronic journals.

Herman (2001) carried out a study on the transition of electronic information era from the published literature in the changing information environment. He also studied several aspects in creation and dissemination of knowledge in the electronic era and its influence on the users information needs.

During a research interview by Tenopir and King (2001) many scientists informed that electronic journals were highly important to their work, more than any other information resources. They further found that the quality of information that a scientist gets from refereed journals contributed to their improved performance.

Arora (2001) studied the growth of Internet and associated technologies, in particular the World Wide Web (WWW). He pointed out that after the advent of WWW providing information services in an entirely new medium, local library is no more the only source of information to the users. Through WWW, the users are interacting virtually with a host of resources that a library cannot generally access to. The librarians should help users to search effectively and help them to judge the quality and usefulness of the information that they encounter.

Mahapatra and Panda (2001) explained the theory of Information Seeking Behaviour (ISB), which narrates its concept, related psychological and behavioural options. They also highlighted various methods of information seeking, different models of ISB and its impact along with some observations of few researches conducted on ISB.

Tripathi and Prasad (2001) conducted a comparative study which dealt with the similarities and differences of information seeking behaviour of physical science scientists and social science scientists. They also elaborated various sources of information used and different methods followed by scientists of both groups to identify the needed information and the problems they encountered while seeking information. The bibliographical sources used by the scientists were also explained.

Hiller (2003) studied the similarities and differences between scientists and engineers and other academic scientists in their library use and information needs at the University of Washington. The decrease in physical visits to the library was mostly represented by faculty and graduate students in health sciences, sciences, and engineering. Faculty in science and engineering ranked the desktop delivery service as their highest priority among various library services.

Abels (2004) pointed out that the frequency of use of the Internet during the period 1998-2000 had greatly increased. He analyzed how electronic journals changed the information seeking behaviour of investigators and in turn, affected end user access to the library. Further he also examined the impact of electronic journals on the utilization of the library by the scientists.

Patitungklho and Deshpande (2005) reported that 53% of faculty members consulted knowledgeable persons in their field, 41% discussed with their colleagues, 39% discussed with librarian (or) reference staff and 35% used library catalogue for seeking information. Faculty members mainly sought information for preparing class lectures, updating knowledge, presenting papers, doing research etc. The authors found that textbooks followed by periodicals were the most used type of information and non-availability of sufficient materials, lack of time and incomplete information materials were some constraints faced by the respondents. Most of the faculty members who used internet felt that it provided access to a large amount of data, saved time and money and it was an opportunity to consult several experts (via discussion groups). It was also found that Google was the most used search engine, because of its accessibility, regular updating and links provided to other web sites.

Bruce (2005) explained that 'Personal information management' is the exercise of organizing the information that is useful in our day-to-day life. One of the actions of personal information management is to retain information for future use and maintain the information in their personal collection. It is defined that personal information collection is the liberty to search for information to accomplish a task or fulfill an interest. It is a compilation of various sources of information that individuals have collected and stored over a period of time based on their stimulus. This set of actions or behaviour depends upon one's ability to realize the information

need which he / she requires for his / her purposes, it may be for his / her work related or personal or entertainment. The usefulness of this information collection depends upon how he / she understands his / her *personal, anticipated information need* and how he / she translates this understanding into behaviour that collects and manages the information from various sources that consist of personal information collection.

An analytical study conducted by Abouserie (2007) to find out information seeking behaviour among social science faculty, revealed that a difference in the sources used was according to school, gender, academic ranks and years spent in the university. Further, the study found that research depended more on electronic sources than the other two tasks, teaching and service and teaching depended more on electronic sources than service. It was also found that research depended more on traditional materials than teaching and service. And teaching depended more on traditional library materials than service. The study showed a high percentage of faculty members read from their offices, while a low percentage of them read from home and a very low percentage read from the central library and departmental libraries.

Asemi (2005) found that the researchers of the university were getting quality information through Internet. The university library provided access to various databases and online journals. It was found that 55% of the respondents got scientific information from their library.

Mulla and Chandrasehekara (2006) attempted to find out the importance of Internet and level of satisfaction of Internet based information sources. Collection and service infrastructure of the libraries in sampled regions were not up to the mark and libraries were struggling to build digital collections for dissemination due to lack of ICT infrastructure, IT trained manpower and paucity of funds, etc.

Tahira and Ameen (2007) carried out a study on the information needs and seeking behaviour of science & technology teachers in Pakistan and the role of Higher Education Commission (HEC) which spends a huge amount of human and financial resources to provide access to the e-journals from leading American scientific societies and US-based academic publishers. The results indicated that the teachers

recognized the libraries and online sources as ‘very important’ for all purposes. With regard to choice of information resources by respondents, it appeared that seeking ‘general web resources’ was their top priority. Surprisingly, international university libraries/centers were preferred than other national university libraries/centers in Pakistan. Personal library was considered important than colleagues and personal contacts and other national university libraries/centers. Though consulting ‘public libraries’ was their last choice, they considered it an important resource for meeting information needs. They also observed that none of the information resources was considered extremely important to get relevant information. The authors found that in the presence of e-access to online databases, respondents’ visits to ‘departmental library’ and ‘university library’ were slightly decreased. The respondents spent comparatively more time on searching web sources than print sources. It was concluded that the teachers’ information needs were associated with the teaching activities followed by research activities, general web resources, university libraries and HEC digital library in that order. It appeared that due to lack of awareness regarding the HEC sources they were underutilized. However, the authors strongly felt that there is a need for information literacy workshops for the academic community, enable them to make extensive use of all types of information sources, specifically HEC databases.

A study was conducted among the geography faculty members to compare their information seeking between teaching and research by Borgman et al. (2005) with 21 faculty members in Los Angeles. It was observed that seeking information was a regular activity of the geographers who were persistently in the lookout for documents, images, datasets, ideas, people and resources that may be useful for research or teaching. They were found spotting useful images or examples for teaching while searching for research materials and some trying out research ideas in class, so that resources initially used in teaching may become research documentation. In general, research influenced teaching more than the latter influencing the former. Working with their research data in teaching reinforced their research thinking, and occasionally, generated new hypotheses or theories. In addition, Faculty often found useful items for teaching in the process of searching for research topics and, sometimes, research ideas or resources while gathering information for teaching. Faculty appeared more willing to share teaching modules than to share primary source

data used for research. Information seeking for research and teaching were mostly complementary and mutually reinforcing. Faculty was more likely to encounter useful teaching resources while seeking research resources than encountering the latter while seeking the former.

Barjak (2006) stated that frequency of use of internet for information retrieval and communication has resulted in increase in publication production of the scientists. He also found that the technology that helped to deliver the information and a communication process that the technology facilitated and served as a medium for the information.

A survey was conducted of academic science researchers at the University of North Carolina at Chapel Hill by Hemminger, Lu, Vaughan, and Adams (2007). 91% of researchers reported as having access to the internet in their office or lab, and essentially everyone had access in their department. Despite how convenient the physical library is to majority of participants, their comments indicated that having to walk to get resources was much less desirable than accessing them from their office computer. This was also reflected in their response on frequency of visit to the library physically. The types of resources used most frequently by researchers were journals, web pages, databases, and personal communications, in that order. Almost all the researchers preferred to search using electronic versions of resources. A slightly greater percentage of Medical Science researchers (98%) used only electronic searching compared to Basic Scientists (95%). They have showed a slightly higher preference for print (29%) compared to the Basic Science researchers (24%).

Tenopir, King, and Bush (2004) found a trend in researchers' behaviours, with researchers becoming aware of convenience and quality of electronic resources and hence, frequently utilizing them as their quality and convenience of access improved. It is clear that today most academic researchers primarily use electronic access for searching and retrieving content.

A study on information seeking behaviour of interdisciplinary scientists by Jamali and Nicholas (2008) revealed that there were differences among scientists working in subfields of physics and astronomy in terms of information seeking

behaviour and there was a need for viewing at narrower subject communities within disciplines for a deeper understanding of the information seeking behaviour of scientists.

Guruprasad, Nikam, and Mudkavi (2010) discussed the impact of internet, the availability of high-speed networks supporting scientists and engineers to get access to electronic journals right at their desktops and also keep track of the global R&D happenings in their respective field of specialization.

Niu and Hemminger (2012) studied the factors that affect the information seeking behaviour of academic scientists. Out of many factors *viz*. demographic, psychological, role-related and environmental background that affect information seeking behaviour of scientists, academic position was found to be the most important determinant of information seeking behaviour.

Devendra and Nikam (2012) revealed that the search process in Online Public Access Catalogue (OPAC) has more or less remained the same, as in the card catalogue but with increased access points. They opined that the OPAC is an instrument of change in today's libraries and will continue to enhance the usage of library collections.

Lal, Kaur, and Kumar (2012) revealed that the library collection plays an important role in information seeking of users. Majority of faculty members visit the library weekly / fortnightly. Faculty members' primary channel of information was discussion with colleagues, discussion with librarian and library staff. They also make use of internet, a few of them consult with subject experts and some of them refer review articles, indexing and abstracting journals. Most of the faculty members seek information for taking classes, guiding researchers and updating knowledge. It was also stated that even today most of the users prefer to refer textbooks, reference books, general books and journals. Problems in information seeking were observed that information has been scattered in variety of sources. All the required material was not available in the library and guidance from library staff was less. Finally, they concluded that social science faculty members were used printed materials enormously than digital materials.

2.4 INFORMATION SEEKING BEHAVIOUR OF PROFESSIONALS IN VARIOUS FIELDS

Hazarika (2005) reported that journals provide the lion share in the citation pattern of the Indian forestry scientists, followed by books and monographs, conference proceedings, and report/technical notes. It is significant to note that not a single web citation has been recorded in this study. Foreign journal dominated the citation pattern (70%) of the Indian forestry scientists. The author opined that journals are the indispensable source for a library of any research and development organization as they play a pivotal role in the communication channel.

Davis (2004) reported that an analysis of referral URL (Uniform Resource Locator) data by the Cornell university IP (Internet Protocol) address from the American Chemical Society (ACS) servers, shows that 84% of referrals of bibliographic databases from SciFinder Scholar, a database of chemistry abstracts. 'PubMed' accounted for 15% of the bibliographic referrals. Within the web page category, the most frequent type of referral came from ACS journal web pages. 10% of the referrals were identified from generic web searches, 81% of them from Google, followed by MSN and Yahoo. Referrals by e-mail amounted to 6% of total referrals. Article linking comprised 5.7% of total referrals. Referrals from the Digital Object Identifier (DOI) server (dx.doi.org) were the most prevalent method (about 82%). Referrals from individual journals like Nature, Science were also identified. Users, in general, followed a few and consistent methods to locate information. IP addresses that were identified as representing aggregate users were associated with more sources of referrals. The relatively high referrals from generic web searches and web pages indicate that these sources were providing substitutes for traditional tools such as the library catalogue and bibliographic databases. This study demonstrated that scientists follow a number of different pathways to scholarly information, but individuals depended on a very few and consistent methods.

Macmullen and Denn (2005) observed that the application of physical tools and logical tools to molecular biology helped to generate the wealth of data currently available. There has been continuous focus on trying to discover the characteristics of molecular biologists as a user group and to describe the kinds of tasks that members

of this group want to be able to do. There is a great need for library and other information intermediary services to help molecular biologists navigate to the information they need. There is a need for more work to develop multifaceted search systems which include information systems analysis and design, database design and administration and software design, development and testing.

Pujar and Sangam (2007) conducted a study on information use by economists. They found that books were used to a lesser extent compared to government / statistical publications and research reports. This supports the view that statistical information is at the core of economics research. Current journals were used less than books, which is common in the case of social science research compared to sciences. Use of gray literature such as discussion/ occasional/ working papers was encouraging. In case of CD-ROM sources of information, bibliographic databases were frequently used compared to other forms of CD-ROM sources. Majority of economists never used full text electronic journals and computer programs. It was found that, among the internet sources of information, discussion/occasional/working papers were frequently used, followed by full text documents including electronic journals. Among the institutional sources of information, World Bank was frequently quoted by majority of the respondents followed by International Monetary Fund (IMF) and Social Science Research Network (SSRN), the services of the national networks and documentation centers such as DELNET (Delhi Library Network), INFLIBNET (Information and Library Network), NASSDOC (National Social Science Documentation Centre) etc were moderately used by the respondents.

Anwar and Asghar (2009) conducted a survey of information seeking behaviour of journalists in Pakistan. 58% of journalists in Pakistan used the internet as a source of information but the journalists in Kuwait placed the internet at the top rank in terms of its importance as a source of information as well as in terms of satisfaction that they gained with the information obtained. It appeared that ‘conversations’, ‘phone calls’, ‘letters from general public’ which provide direct contact with the source of information were the primary sources of information for print journalists. More than half of the respondents used the information for ‘writing a news item’ (56.3%) and ‘writing an article’ (39.1%) and only 5.7% of respondents used it for ‘writing an editorial’. The libraries maintained by the newspaper agencies

were used by their staff to locate pertinent materials for their stories. The purpose of using the library was ‘to borrow materials’ and ‘to study back volumes of journals and newspaper files’. The main problems of journalists identified were: ‘lack of training in information use skills’ and ‘lack of available time’ for searching information. The authors concluded that the Pakistani journalists were deficient in information searching skills than Kuwaiti journalists.

Koovakkai and Jalaja (2006) identified that graduate and postgraduate career seekers did not differ much in the level of requirement for materials providing information about training and education opportunities, resources for preparing for interviews/group discussions, altering service, career guidance and career related information resources at one place. On the contrary, level of requirement of documents for career selection, documents publishing formats of application forms, materials which help to prepare application/ resume, materials for preparing for competitive examinations and internet/electronic resources differed considerably; higher level of requirement necessary for postgraduate than graduate career seekers. They revealed that postgraduate career seekers are more serious in the search for a career and for the preparation for getting a job. They also observed that as postgraduates have more options and possibilities for employment, they need more information than the graduates.

Sahu and Goswami (2008) reported that metallurgical researchers at NML (National Metallurgical Limited) spent 16% of their research time on reading and literature searching whereas research scholars spent 25% of time for this purpose. The scientists preferred using primary sources of information, particularly journal and review articles. The researchers felt that they were up to date with regard to scientific information due to sufficient library collections and services.

Sahu and Goswami (2009) studied online access and productivity in research publications. The electronic resources were highly beneficial to the R&D (Research & Development) users of the library as evidenced by the increasing number of qualitative research publications compared to earlier trends. The findings also indicated that expanding usefulness of online access to scientific journals and services catering to the information needs of scientists.

Raza, Fatima, and Upadhyay (2010) conducted a survey and found that most of the researchers at the Central Drug Research Institute (CDRI), Lucknow visited the library weekly, to collect reading material. The OPAC (Online Public Access Catalogue) was the most used resource for searching and they preferred the search by subject and most of them used Internet for e-mail and faced the problem of slow speed.

Mishra (2011) studied the information use patterns by scientists of NEIST (North East Institute of Science and Technology), Jorhat, North East India and reported that NEIST was adequately equipped to provide value added services to their scientists and others.

Ramesh (2012) explored the result of the study based on public libraries in Erode Corporation, Tamil Nadu and found out the reasons for using electronic media like TV, CDs and DVDs and how it affected the reading habits of people.

Sahu, Goswami, and Choudhury (2013) reported that digital institutional repository of CSIR-NML (Council of Scientific Industrial Research - National Metallurgical Limited), Jamshedpur, achieved 21 fold increase in traffic, with over 4.86 million hits since inception. The information seekers from several foreign countries accessed to CSIR-NML e-prints repository and benefitted in their knowledge domains.

2.5 INFORMATION SEEKING BEHAVIOUR OF AGRICULTURAL SCIENTISTS

Majid, Anwar, and Eisenschitz (2000) reported that most Agricultural scientists in Malaysia visited libraries personally when they needed to search the library OPAC (Online Public Access Catalogue), browse periodicals or use other sources for identifying new information on their areas. Sometimes they sent their juniors to get photocopies of articles to check out books or to get information from sources already known to them. It was also found that the scientists used their libraries extensively while preparing research proposals and writing reports. Further, they reported that the scientists spent 16% of their office time for reading the research

literature as compared to 9.3% of time spent by academicians for preferably using primary sources of information such as journals and research review reports.

Singh and Satija (2007) found that 72% of Agricultural scientists were dependent in meeting their information requirements on their institutional library / information centre. The review articles in periodicals were ranked first followed by discussion with colleagues within the organization as the most preferred source of information. Only 42% of Agricultural scientists used abstract / indexing journals and only 25% of scientists considered the Librarian / Reference staff as an important source of information. The Agricultural scientists heavily relied on computerized information search facilities i.e., they were more familiar with computerized services and find it more reliable. It has been reported that agricultural scientists considered journals as a significant source for obtaining specific type of information and the least source for obtaining specific information was dissertation / theses mainly due to non-availability and lack of direct access. Attending lectures, conferences, seminars etc… were identified as the most important sources of information for keeping up-to-date. Books followed by journals were identified as best sources of information for getting background information on a research topic. The authors concluded that working culture of the individual, importance of getting information, the facilities available for seeking it and knowledge about these facilities were some factors that may affect information seeking behaviour.

Oladele (2010) stated that majority of the Agricultural researchers in Nigeria were aware of almost all the electronic communication tools except World Wide Web and e-mail. According to him, a high percentage (62.5%) of researchers never indicated whether or not they are aware of the WWW. The highest use of electronic communication tools among the researchers were Radio, Television, and OPAC. It was also found that awareness of researchers on the agricultural databases also was low. It was concluded that specific training needs of the researchers to seek appropriate information from different sources should also be identified as a skill-gap.

Sharma and Gupta (2012) conducted a survey on the Internet use by the faculty members of Agriculture and Veterinary Sciences. The findings showed that Bharat Sanchar Nigam Limited (BSNL) was one of the major internet service

providers with mostly dial-up connection. Internet was used almost on daily basis by most of the faculty members. The problem faced by the faculty members was that most of the time speed of internet was slow. Google and Yahoo were the most often used search engines by the faculties.

2.6 INFORMATION SEEKING BEHAVIOUR OF ENGINEERS

Mahapatra (2006) found that there was a close relationship between the information needs of engineers and their library use. She also reported that engineers at entry and top levels do not visit library frequently and do not require information daily. The engineers in general, use encyclopedias, handbooks, textbooks, periodicals and patents for their academic / research purposes. The in-house reports got the top rank followed by current periodicals, annual reports etc… among the sources of information available. As far as computer / e- databases are concerned, bibliographic databases, full text databases and abstract databases were used to a great extent by different level of engineers. Only 40% of engineers preferred to use internet services in their libraries and maximum numbers of engineers were willing to get information online. The study concluded that among the library services available, the online access and internet services were the two most popular services for the engineers at all levels.

Guruprasad and Nikam (2010) analyzed the effect of e-journals on the research output of Aerospace engineers. The study revealed that reading e-journals saved time, helped to gain more scientific knowledge, resolved technical problems, helped complete their tasks quickly and organize archiving papers more scientifically.

Singh (2013) analysed that only 30% of users of NIT (National Institute of Technology) library at Jalandhar visited their library daily. 30% of users were using general books, 29.41% of them used CD-ROM databases, 25.29% used reference books and 20% of them were using technical reports and compact disks. Majority of users (46.47%) were accessing online databases by themselves and 31.77% of them using online databases with the assistance of library staff. Online database search techniques or tools such as Keyword searching, Boolean operators, Truncation and wild cards etc. There were 53% of users who did not use library networks. 10% of the respondents used e-mail services of the library, 7.05% of them used other library

networks such as DELNET, INFLIBNET, NICNET etc. and majority of the users were satisfied with facilities provided by the library.

2.7 INFORMATION SEEKING BEHAVIOUR OF DEFENCE SCIENTISTS

Sharma and Pant (2004) found that scientists need information at every step of his research work from the time that the idea sprouts in his mind to the time it's taking final shape.

Satishkuamr, Gautam, and Vijayaraghvan (2011) revealed that most of the Defence Research and Development Organization (DRDO) scientists (78.37%) opted libraries / information centers, consulting indexed journals and review articles, for meeting their information requirements. The scientists significantly rely on computerized information search facility which indicated that they were more familiar and comfortable with the computerized information and found it more reliable. They concluded that journals followed by books were the top sources of information among the range of sources used for obtaining specific information, to keep up-to-date and acquiring background information on their respective field.

2.8 INFORMATION SEEKING BEHAVIOUR OF PROFESSIONALS IN CORPORATE SECTOR

Padmamma, Vijayakumar, and Vasudevan (2002) pointed out that around one third of the scientists working in Vishweshvariah Iron & Steel Ltd., visited the information centre to collect information for their research, study and activities. About 31% of the respondents viewed that the education of the respondents was one of the factors which decides their information seeking behaviour.

Das (2005) reported that the information needs of scientists in Oil and Natural Gas Commission (ONGC) varied in accordance with the organizational needs, the specialization of individual scientists and the demand of assignments of regional work centers.

Mahapatra (2006) attempted to correlate the need of information with habits of using library by scientists working in Indian petroleum industry and stated that information needs and habit of library use of scientists were related to their official

position in the organization. The online access services, offline digital sources and internet services were the most popular library services in upcoming electronic culture.

Yousefi (2007) based on the data from an axle and spare parts manufacturing company in Iran found that there were considerable differences in the information needs and information seeking behaviour of those in the categories of social science and engineering. In contrast, there were many similarities in information seeking behaviour between the categories of social science and accounting and trade. Within groups, those in the category of engineering showed stronger similarities in information needs and behaviour than in the other two groups. For the engineering group, the information resources available in the various departments were not adequately updated. Although they could obtain more updated resources in the networked environment, they showed less use of these resources and preferred printed materials. On the other hand, social science and accounting and trade experts were found to be considerably less skilled in using electronic resources. The engineers placed greater importance on the age of the material; information resources older than ten months were considered to be less important for their projects. However, those in the accounting and trade group claimed that all resources were equally valuable independent of their age. Library usage of engineering experts was found to be greater than the other groups and was related to their occupational activities. He concluded that researchers in each department can co-operatively work with or alongside librarians and the librarians should provide specific information seeking skill instruction to each department related to their career and professional activities.

Ibrahim and Allen (2012) conducted a study during a major incident on oil rigs at Port Fourchon, Louisiana and noted that the ability of offshore crews to share information with each other and communicate effectively could be the difference between life and death, between minor environmental damage and an environmental catastrophe. From the earlier studies it was found that effective information sharing could have saved many lives, on offshore oil rigs / industries. The crew members were working together and communicating directly, rather than remotely. Unlike mediated communication, which may obscure or distort emotions, face-to-face communication enabled the crew to take in aspects of nonverbal communication,

thereby achieving intersubjectivity. Effective information sharing could help instill trust, even in the crucial early stages of emergency response. When information is not effectively shared, collaborative group work fails. They also strongly suggested that the collapse of trust, which could have been reestablished through better information sharing, might have been a greater contributory factor.

Bharosa and Janssen (2010) found that information sharing and accurate communication were among factors determined as influencing employees' trust in their organization.

Kostoulas, Aldunate, Pena-Mora, and Lakhera (2006) proposed a decentralized model of trust to reduce the unreliability of information in disaster relief operations. They argued that first responders are usually reluctant to interact with others from different organizations because they have had little prior interaction, despite the adhoc networks available. Therefore, to improve collaboration among participants in disaster operations, participants must be given the ability to assess the trustworthiness of others and information propagated by them.

Schraagen, Veld, and Koning (2010) opined that emergency response team with a network, rather than hierarchical structure was able to exchange information quickly, monitor each other's performance and build up mutual trust.

Yitzhaki and Hammershlag (2004) reported that the respondents preferred oral discussions with colleagues / experts inside the organization. Typically, the academy group used professional journals as a main information source in the academy, and conference / meeting papers, in printed and internet version. On the other hand, the industry group, which preferred bibliographic databases (internet) and oral discussions with supervisors, relied more on in-house technical reports (printed), handbooks and standards, textbooks, and government technical reports available on the internet. Perhaps, faculty members found it easier and more convenient to consult the print sources available in the library.

As far as informal sources are concerned, the industry group reported greater use of discussions with supervisors (oral), librarians and technical specialists (internet). Among the academy group, the difference between printed and internet was much greater, more than fourfold. Evidently, electronic sources were not yet dominant (in 2000) in academia or industry. Internet use in industry and academy was much lower than that of expected. Further, no significant differences were found between electronic professional journals and bibliographical databases for both groups.

2.9 INFORMATION SEEKING BEHAVIOUR OF HEALTH PROFESSIONALS

Zawawi and Majid (2001) revealed that biomedical scientists used a variety of information sources to satisfy their information needs. The scientists considered journal articles as the most preferred information source. On the other hand, researcher-cum-lecturers considered books as the most preferred information source for their information needs. Both group of users also considered interaction with colleagues as an important source for satisfying their information needs. This study also revealed that most of the respondents still preferred to use printed materials even though they had access to many modern and advanced digital information sources.

Selvi and Ozerkan (2002) reported that among Dentists discussions with colleagues, textbooks, and dental products advertisements were the most frequently utilized information sources and the infrequently used sources were Medline CD-ROMs, Science Citation Index, web pages of Dental schools and Professional CD-ROMs. Further, use of electronic (or) computer information services was low among Dentists, Whereas textbooks, international professional meetings and clinical continuing courses were considered to be most helpful information sources. Only 60% of Dentists used computers with internet facility for academic purpose while the rest used the facility for games and entertainment. Interest in taking research projects was lower among senior scientists than young scientists. This study also indicated that most of the dentists were engaged in private practice, hence, they did not have much time for information seeking.

Landry (2006) clearly indicated that among Dentists, various work role tasks required different sources of information. Textbooks were favoured for patient management / service provider. Dentists had continued reliance on traditional sources to meet their information needs. However, with availability of the internet, it might be anticipated that it would stand out as a major information source for practicing dentists; but surprisingly, data did not support this presumption because, for each work role scenario, more than half of the preferred sources chosen was traditional. Further, state and local societies were preferred as the primary information source for Continuing Dental Education (CDE) and dentists indicated that trustworthiness was the main criterion for choosing a particular source. Two-third of study participants indicated that they used e-mail to communicate with colleagues, convenience, speed and elimination of the phone tag nuisance made it a desirable form of communication. Lack of time and irrelevancy of material found were the two barriers in searching both internet and traditional sources.

Trivedi and Joshi (2009) found that there was a growing use of e-journals over print journals; however, the study did not show a significant decrease in use of print journals compared to e-journals for research purposes.

Grad et al. (2011) conducted a study involving a cohort of 41 family physicians duly certified by the College of Family Physicians of Canada to whom research based information was provided on a handheld computer. Each participant received a handheld computer (personal digital assistant) with Information Assessment Method (IAM) enabled software. The frequency of searches averaged to about one search per physician per week. 90% of the physicians reported high speed internet access and 83% physicians reported using online guidelines or journals. In terms of computer self- efficacy 20% of physicians rated their level of skill as advanced, 78% physicians as intermediate and remaining as beginners. 75% of searches were done with more than one objective in mind; the most frequently reported objective was to address a clinical question.

Magrabi et al. (2008) conducted a study among physicians working in primary health care hospitals and found that physicians' average search was only one information search per week in primary care hospitals.

Wessel and Tannery (2006) conducted a study to understand the literature searching experiences and skills of clinical research coordinators at a large academic medical center. They found that 50% of Clinical Research Coordinators (CRCs) consulted the medical literature 1 to 5 times a month for their job related information. However, it was also found that 6% of respondents never consulted the medical literature, 4% of them spent 16 or more hours to refer Ovid Medline or Pubmed database and 28% did not spend any time for this activity. Ovid Medline, electronic journals and Pubmed are frequently used resources by 50% of respondents and other 50% of respondents said that they 'never use' or 'unfamiliar with' these resources. The use of Ovid Medline and Pubmed indicated the problems in locating relevant medical literature. These problems include time factor, skill of selecting appropriate keywords for the literature search and difficulties associated with balancing precision and recall. Many important resources such as Web of Science, EMBASE.com, Micromedex and Old Medline are infrequently used sources by the participants.

Zhang, Zambrowicz, Zhou, and Roderer (2004) in their study of information seeking behaviour in a medical web portal (MyWelch) environment conducted during December 2002 – February 2003 found that there were three differential sequences *viz*. a) more click numbers but short browsing: under this users intended to stay in two major seeking modes, mainly browsing and monitoring. b) moderate click times and longer time browsing: under this user employed all the information seeking modes and c) longer time, had the fewest number of clicks and used all of the information seeking modes. The t-test showed that the differences between these three areas are statistically significant. Based on their preliminary study, it was assumed that a portal environment allowed users to be more functional and content-driven than a regular web-based environment since it provided a single, customizable interface that offered many ways for users to seek information.

Corrall, Wyer, Zick, and Bockrath (2002) summarized the fundamental information searching aspects in the area of emergency medicine, including methods of forming foreground questions, selection of databases, formulation of search strategies and the resulting examinations. Among health related information resources, MEDLINE was found to be one of the most popular among the respondents.

Hersh et al. (2002a) through a survey of 45 medical and 21 nurse practitioner students examined how MEDLINE helps to obtain evidence for answering clinical questions and reported that the MEDLINE search experience was strongly associated with success in answering questions and that students participating in clinical training were only moderately successful at finding correct answers to clinical questions with the assistance of MEDLINE searching.

Hersh et al. (2002b) described a Web-based asynchronous consultation service called Professional's Information Link (PiL), in which questions and answers from health care professional would be facilitated as human experts that were considered as more efficient information sources.

Tang (2007) analyzed the usage of PubMed by the medical professionals. In general, they were fairly familiar with PubMed recording over 50% of them giving a high score. It was found that 78% of the query submission methods did not change. Over half of the search sessions (67%) were characterized by the participants as searching for background information. The MeSH (Medical Index Subject Headings) selection was never used when a single fact was sought, whereas a single line query box was used most often using subject search. Most of the participants considered the brow sable thesaurus most useful when they were unfamiliar with the topics and had only a very general idea about what to look for. The most frequently cited reason for not using the faceted display was that the users already came equipped with their own specific query terms.

Ashraf (2012) found that 83% of physicians / surgeons were satisfied with the availability of Internet facility at their work place. Majority of physicians (80.5%) opined that every medical institution should establish a separate library which can organize seminars, continuing medical education (CME) lectures, user awareness programmes periodically in order to create awareness among users about the available information sources both in print and electronic media. To keep abreast of new developments in their respective fields, physicians mainly use books and journals as information sources. Meeting with colleagues frequently help clear their doubts and such meetings motivate to use information sources. Physicians knew that

enhancement of their computer skills, internet searching skills etc., were essential to improve their practice effectively. Only 29% of physicians were using open access e-books /e-journals in their fields.

Umesha and Chandrashekara (2013) reported that 97.4% of the respondents consisting of teaching faculty and PG students had access to internet facility. 91% of the respondents regularly used internet and spent maximum time on it. 87.3% of Dental professionals used e-mail service regularly. Majority of the respondents preferred to have online libraries exclusively in their field. It was observed that training and orientation courses conducted by the libraries were much useful with 71.6% of respondents positively agreed on that. However, it was also inferred that lack of training and information overload were found to be the affecting factors of information usage. It was further analysed that the dental libraries in Karnataka were equipped with required number of computer systems with internet bandwidth. However, printed reading materials were more than the e-resources which resulted in a miss-match between users' behaviour and collection of materials in the libraries that ultimately has to be analysed. The needs of the users were not similar as the purpose of information seeking varies, most of the professionals had discussion with their colleagues and attended continuing education courses frequently. It was also suggested that librarians should co-ordinate with the professionals to assist them to retrieve information from online sources, as the professionals were not familiar with keyword searching, appropriate terminologies from thesaurus and syntax.

Clarke et al. study (as cited in Perryman, 2014) on information seeking behaviour analysis of primary care physicians and nurses. It was revealed that both group members require information on drugs, diagnosis and treatment. Most frequently used information source was internet including web based searching and bibliographical databases. The other sources of information were textbooks, journals, discussion with colleagues, handbooks on drugs, subject related websites and medical libraries. There were no much differences between two groups. Limited time to access information, lack of searching skills and location of libraries are far away from their work place were stated as barriers to them and also it was a general phenomenon that rural practitioners continue to be affected by limited access to resources.

2.10 INFORMATION SEEKING BEHAVIOUR ON THE WEB

Kim (2009) found that most subjects relied on a keyword search to locate the web page and looked through many pages to find out an exact word or phrase. They performed various keyword searches, different combinations of keywords, or the exact sentence using the terms described in the task scenario. Further, they kept browsing by following the internal links at one or two specific web sites considered authoritative, sometimes becoming more focused as they followed the links. Many participants stopped their searches when they found a page that had lots of links and frequently planned on a later use of information. The participants relied mostly on typing in queries in general purpose search engines such as Google and then browsing the result description to pick out the search terms that matched the exact queries they typed in. It was concluded that users' information seeking behaviour was influenced by their tasks. Many researchers had begun to conceptualize the task as the most important factor in defining information seeking, both theoretically and empirically.

Solomon (2002) found that a task is a basic force that influences people to select sources, discover information from the sources, evaluate information so discovered in relation to the goal, and gain new insights for attaining the goal.

Bystrom and Hansen (2005) expressed that more attention has to be paid to the task as the significant contextual factor for information seeking and retrieval studies. The study showed the need for modeling the context in which users perform a task and interest in conceptualized work tasks.

2.11 INFERENCES

A comprehensive literature review was conducted consulting both print and electronic documents from various reliable sources to elaborate the concept of information seeking behaviour and to identify the research gap. The studies starting from 1998 to 2014 were summarized based on the thematic clusters such as the studies on information seeking behaviour (ISB) of Students, Research Scholars, Faculty Members of Universities/Institutions, Agricultural Scientists, Engineers, Defense Scientists, Health Professionals, and Corporate Sectors. It is true that all

these studies reviewed under different clusters paved way to the researcher to understand the concept clearly and be able to assess the present scenario of ISB of stakeholders in different fields. It was observed from the earlier studies that the research findings would have the direct impact on the institutions, libraries, policy makers, users of different categories (i.e. Students, Research Scholars, Faculty Members, Scientists, Engineers, Health Professionals, etc.) including corporate sector. However, the results of these studies could not influence the people who work at grass root level like farmers or cattle owners. It is evident that 30% of agricultural income of the country is from animal husbandry (National Accounts Division, MOSPI, Government of India – 2013). People from rural areas such as backward, hilly, tribal and drought prone areas entirely depend on Livestock sector for their livelihood and employment. Veterinarians play an important role in the maintenance of animal health and production; thereby help the agricultural economy of the country. The studies of above nature were not conducted among veterinarians, so far. Well informed veterinarians can make informed decisions in treating animal diseases; will go a long way in alleviating the animal health issues which benefit the livelihood of the farmers. Hence, the research gap was identified to carry out the study on information seeking behaviour of veterinary professionals in South India.

CHAPTER 3

METHODOLOGY

3.0 INTRODUCTION

This chapter provides a frame work for the research that helps in describing the various techniques and procedures used to accomplish the research programme. It deals with the various methods used with respect to selection of sample, identification of appropriate variables and their measurement, method of data collection and analysis. The methodology followed is presented under the following sections:

3.1 PROBLEM IN FOCUS

The present research examines the information needs and information seeking behavior of Veterinary professionals working in Veterinary Universities in South India embracing Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and Puducherry states.

3.2 RESEARCH DESIGN

The present study is descriptive. It describes the veterinary professionals' information needs and information seeking behaviour and their relationship with various independent variables like gender, educational qualifications (PG degree, PG degree with diploma, Ph.D., and Post Doctoral degrees), subject specializations (clinical or non-clinical) and institutes where they are working.

3.3 STUDY AREA

The region considered under this study is South Indian States *viz.* Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and Puducherry. The research is based upon the veterinary professionals studying / working in the veterinary academic institutions (veterinary universities and its constituent colleges) located in each southern state of India including Puducherry state.

Each of the States under this study has a Veterinary University and its constituent colleges as mentioned below:

1. Tamilnadu Veterinary and Animal Sciences University, Chennai, Tamilnadu.
   Its constituent colleges located in other parts of Tamilnadu are:
   - ❖ Veterinary College and Research Institute, Namakkal
   - ❖ Veterinary College and Research Institute, Orathanadu
   - ❖ Veterinary College and Research Institute, Thirunelveli
2. Kerala Veterinary and Animal Sciences University, Pookot, Wayanad, Kerala.
   Its constituent college located in other part of Kerala is:
   - ❖ College of Veterinary & Animal Sciences, Mannuthy, Thrissur
3. Sri Venkateswara Veterinary and Animal Sciences University, Thirupati, Andhrapradesh.
   Its constituent colleges located in other parts of Andhrapradesh are:
   - ❖ College of Veterinary Science, Rajendranagar, Hyderabad
   - ❖ N.T.R. College of Veterinary Science, Gannavaram
   - ❖ College of Veterinary Science, Proddutur, Kadapa
   - ❖ College of Veterinary Science, Korutla, Karimnagar
4. Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, Karnataka.
   Its constituent colleges located in other parts of Karnataka are:
   - ❖ Veterinary College, Hebbal, Bengaluru
   - ❖ Veterinary College, Hassan
5. Rajiv Gandhi Institute of Veterinary Education and Research (formerly Rajiv Gandhi College of Veterinary and Animal Sciences), Kurumbapet, Puducherry.

3.4 DESCRIPTION OF THE POPULATION

The respondents for this study include the Veterinary Professionals working in Veterinary Universities and its constituent colleges located in all the states of South India. The term 'Veterinary Professionals' denotes the faculty, Ph.D research scholars and PG students working / studying in veterinary universities and its constituent colleges. The term 'Faculty' includes the Professors, Associate Professors, Assistant Professors, Teaching Assistants, Research Associates, possessing at least a

PG degree in veterinary science and engaged in teaching / research / extension activities in veterinary universities and its colleges / research stations / farms.

3.5 SAMPLING TECHNIQUE AND SAMPLE SIZE

The researcher distributed questionnaire to all the veterinary professionals (800) working in the departments / farms / research stations of veterinary colleges / universities. Out of 800 respondents in the total population, 678 respondents returned the duly filled questionnaire with a response rate of 85%. This sample of 678 considered for the study comprises faculty members, Ph.D research scholars and PG students from different age groups, gender, qualifications, specialization and experience.

3.6 METHODOLOGY OF DATA COLLECTION

Data on information needs and information seeking behavior are collected by the survey method. Questionnaire is a tool to be used to collect the primary data. A standard structured / open ended questionnaire developed for the purpose of data collection was distributed personally as well as through mail / post to the veterinary professionals. Apart from questionnaire, personal interviews with professionals were also conducted to get additional data and suggestions.

The questionnaire schedule included the following sections to get required information:

- Personal data
- General and clinical information needs
- Use of various information sources
- Role of University / Institute library in providing required information
- Constrains in accessing the information
- Awareness of ICT tools
- Access to internet, e-publications and databases

3.7 STUDY VARIABLES

The following independent and dependent variables have taken up from the questionnaire to analyze the data.

a. Independent variables

- Gender
- Age
- Educational qualifications
- Workplace
- Experience
- Area of specialization (clinical or non-clinical)

b. Dependent variables

- General information needs
- Clinical information needs
- Problems faced by respondents in accessing information
- Level of computer skills
- Use of internet, e-resources and databases.

3.8 DATA ANALYSIS

A punch code was developed for easy and systematic feeding of data into the computer. The data provided by the respondents was analysed using SPSS statistical package version 17.0. The statistical tools used for analysis were Percentage analysis, Chi-square test and One way Analysis of Variance (ANOVA).

3.9 SCOPE OF THE STUDY

The study was undertaken to explore the information use pattern by the veterinary professionals and their awareness on various information sources and services in the institutions under study. The study also attempts to find out the ICT skills acquired by professionals and the role of institutional libraries in providing their required services. The study also suggested to improve the services of libraries to suit the needs of veterinary professionals.

3.10 LIMITATIONS OF THE STUDY

The findings of the study cannot be applied to the under graduate students studying in the veterinary colleges / universities as they are not using library services to a larger extent and ICT based information services are not needed much for their academic purposes. The study is limited to South India only; hence the results of the study can be generalized only to this population. This study does not include the field veterinarians who are having direct contact with farmers and owners of the cattle. Their information needs, problems and expectations were not considered. Further, it is informed that there are 15 veterinary universities / colleges in South India. Out of which 14 institutes were covered under the study. The Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, Karnataka, was established recently and offering UG degree course only. The PG & Ph.D. programmes were just started and hence this university was not considered for the study.

CHAPTER 4

PROFILE OF THE INSTITUTIONS

4.0 INTRODUCTION

With the aim to complete the objectives stated, a detailed study of the library facilities available in some of the premier Veterinary Universities of South India is discussed in this section. The following are the Veterinary universities and its constituent colleges located in the southern states of India.

1. The Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) located at Chennai and its constituent colleges located at:
    - Veterinary college and Research institute, Namakkal
    - Veterinary college and Research institute, Orathanadu and
    - Veterinary college and Research institute, Thirunelveli.

2. Kerala Veterinary and Animal Sciences University (KVASU) located at Pookot, Wayanad, Kerala and its constituent college located at:
    - College of Veterinary & Animal Sciences, Mannuthy, Thrissur.

3. Sri Venkateswara Veterinary University located at Tirupati, Andhra Pradesh, and its constituent college located at:
    - College of Veterinary Science, Rajendranagar, Hyderabad
    - N.T.R. College of Veterinary Science, Gannavaram, Krishna distrrict
    - College of Veterinary Science, Proddutur, Kadapa district
    - College of Veterinary Science, Korutla, Karimnagar district

4. Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU) located at Bidar, Karnataka and its constituent colleges located at:
    - Veterinary College, Hebbal, Bengaluru
    - Veterinary College, Hassan

5. Rajiv Gandhi Institute of Veterinary Education and Research (RIVER), located at Kurumbapet, Puducherry.

4.1 TAMILNADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY (TANUVAS), CHENNAI, TAMIL NADU

4.1.1 History of the University

The history and genesis of the Tamilnadu Veterinary and Animal Sciences University started as early as 1876. Having attained the status of college in the year 1903 the phenomenal growth has resulted as the first Veterinary University in India extending to four branches in Taminadu. The sister colleges are located at Namakkal (1985), Orathanadu and Tirunelveli in the recent years. In addition to this the University also runs a Food technology college at Koduvalli, near Chennai and a Poultry technology college at Hosur, near Bengaluru. With so many laurels to its belt it caters to the needs of the students, faculty, scholars and researchers with a well developed library.

4.1.2 Department of Library Sciences / Services at TANUVAS

Genesis

The initial phases of the Madras veterinary college library had its humble beginning in the year of 1903 along with the Madras Veterinary College (MVC). The growth had been phenomenal over the decades and today the library boasts a transformation from ‘book only” to a modern digital library. In addition it glorifies in the collection of invaluable literary sources in form of journals and e- resources which takes care of the thirst for knowledge and guidance for the scholars and students.

Objective

The main objective of the library is to extend effective and efficient library and information services to the students, research scholars and members of the faculty and, scientists of the University

Location

The library to this date is functioning in a total floor space of about 12,000 sq. ft. of the Student Day Care Centre Building of Madras Veterinary College (MVC), extending to the second and third floor of the building. The second floor houses the Book Section and Book Bank, whereas the third floor is the functioning unit for the Journal-cum-Back volume Section, Digitization Unit, Microfilming Unit and Reprography unit. In addition, an Archive with a total floor space of 2400 sq. ft. has been established in the 1st floor of the Dairy Science Block which houses very old books, back volumes of journals, Masters' and Doctoral theses and other old documents.

Working Hours

The library services is open to the staff and students and the needy on weekdays from 8.00 a.m. to 8.00 p.m. (Monday to Friday) and from 8.00 a.m. to 3.45 p.m. on weekends (Saturdays and Sundays).

Administration

The Library functions under the direct control of the Dean, Madras Veterinary College. A Deputy Librarian, supported by an Assistant Librarian, Library Assistants and other staff members, heads the library. A Library Committee consisting of the Dean, Faculty of Basic Sciences and three Heads of Departments as members and the Head of the Library as the Convener functions at the college level. The committee is headed by the Dean as the Chairman.

Library Services

The following services are rendered by the library:

- Document lending
- Reference
- Education (Offers Compulsory Non-Credit Course PGS 601: Library and Information Services to all PG research scholars)
- Current Awareness Service
- Selective Dissemination of Information

- Online Public Access Catalogue (OPAC)
- Reprography
- Resource sharing
- Online Document Delivery Service (DDS)
- SC/ST Book Bank
- Organization of regular Information Literacy Programme
- Archiving
- Binding of Documents
- Preparation and supply of Identity cards to the library users, staff and pensioners

Activities

Books

The library has a collection of about 40,000 books. Of these, more than 20,000 books are kept as reference books. The collection includes textbooks, reference books, manuals, monographs, dictionaries, encyclopedias and colour atlases. Around 500 to 600 basic to advanced books are added every year for the users of the library.

e-Books

Collection of about 250 e-books at present and all these e-books are accessible via the e-book gateway of OPAC which is available through the Intranet connecting all the three teaching campuses and the University headquarters. The e-Book gateway also provides web links to major e-book gateways which are providing access to thousands of full-text e-books covering various disciplines including veterinary and animal sciences.

Journals

a. Current Periodicals

Journals are the medium of scientific communication which are up-to-date. The library subscribes about 100 foreign journals and 65 Indian journals.

b. Back Volumes

The old journals are hardbound and kept as Back Volumes for reference. So far, the library has built up over 25,000 back volumes of journals.

c. Electronic Journals

In the electronic age, information seeking process is made so much easier and quicker by introduction of e-journals and digital library. Falling in line with modern electronic era, the MVC Library has also activated on-line access to about 100 foreign journals and 30 Indian journals. A list of Open Access e-Journal Portals has also been compiled by the Library and web links established to those portals to ensure easy access to the invaluable journal literature.

d. Consortium for e-Resources in Agriculture (CeRA)

In addition to its own collections, the MVC library has access to Consortium for e-Resources in Agriculture (CeRA), an online journal consortium funded under NAIP of ICAR. CeRA provides access to about 2,800+ online journals covering various disciplines of agricultural sciences including veterinary and animal sciences.

Library Automation

Circulation activities of the library had been automated using "Library Management Software" developed for this library which was replaced by the "Software for University Libraries" (SOUL) developed by UGC. Now, SOUL is replaced by KOHA Integrated Library Management System. Necessary equipment for automation of the library *viz.* computers, printer, scanner, barcode label printer, barcode readers etc., had been procured under NATP / NAIP funds.

Web-Based Online Access Catalogue

The resources of the library in terms of books, back volumes of the journals, M.V.Sc. and Ph.D. theses of MVC, VC&RI and FC&RI, CD-ROMs, VCDs/DVDs and other reports have been catalogued and the web-based Online Public Access Catalogue (OPAC) of the library is available at http://14.139.186.158. At present, 25 computer terminals have been provided for the library users for OPAC.

Digitization

The Library has started digitizing the theses and dissertations and currently abstracts of over 2,600 theses had been digitized and full-text of theses and dissertations submitted after 2000 are available in digital format. Valuable old documents available in the library are identified under e-Granth project of ICAR for digitization and digitization of about 3,00,000 pages of documents are in the pipeline.

4.2 KERALA VETERINARY AND ANIMAL SCIENCES UNIVERSITY (KVASU), POOKOT, WAYANAD, KERALA

Kerala which is one of the most scenic and smallest states of India holds a high potential in growth and contribution of animal and agriculture to the Indian economy. Thus to keep up with the growing animal sector, the government of Kerala has established the Kerala Veterinary and Animal Sciences University, to give more importance to education, research and development of animal sector with emphasis on both the domestic and wild animals.

The Kerala Veterinary and Animal Sciences University (KVASU) was established in December 2010 and is located in Pookot in Wayanad district, Kerala, India. The university (KVASU) has three constituent colleges which include: College of Veterinary and Animal Sciences, Mannuthy, Thrissur, College of Veterinary and Animal Sciences, Pookot, Wayanad and College of Dairy Science and Technology, Mannuthy. In addition to this the university has a B.Tech college which caters to Dairy technology and Poultry science and management at Pookot, Mannuthy, Thumbermuzhi, Thiruvazhamkunnu and Chettachal. In addition to this the university also has research stations at many places. Being a new establishment the University, needs infrastructure to cater to the requirements of the students for education, research and dissemination of the knowledge to all involved. The library, its establishment, growth and functioning plays a major role in acquiring the required knowledge for education and research. The dissemination of the acquired knowledge via e – resources is another side in which the library becomes essential. Thus the facility that paves the road to education via libraries is discussed herein.

4.2.1 College of Veterinary and Animal Sciences, Pookot, Wayanad

The College of Veterinary & Animal Sciences, Pookot, was established on 11 December 2004. The campus is spread over 100 acres in the scenic hilly terrain of Wayanad in Kerala, India. The College offers Undergraduate (BVSc & AH), Postgraduate (MVSc) and Doctoral (PhD) Programmes in Veterinary & Animal Sciences.

Library at University, Pookot, Wayanad

The existing library of the faculty of Veterinary and Animal Science is a part of the faculty building. The library being the heart of the University provides facilities and services to support teaching, learning, research and scholarly communication across disciplines. The accommodation and the infrastructure facilities are excellent. It provides access to various national, international journals and periodicals in addition to an excellent collection of text books and reference books. There is also a separate collection of the thesis and dissertations, besides bound volumes of old journals. Facilities are also provided to students and faculty for access to internet and online journals.

4.2.2 College of Veterinary & Animal Sciences, Mannuthy,Thrissur

The College of Veterinary and Animal Sciences (COVAS), Mannuthy was established in the year 1955 and is one of the constituent colleges of the newly established Kerala Veterinary and Animal Sciences University (KVASU).

College of Veterinary and Animal Sciences Library, Mannuthy, Thrissur

The Library of the College of Veterinary and Animal Sciences, Mannuthy, serves as a central location for all students, faculties and researchers to refer various materials related to Veterinary and Animal Sciences. The Library has thousands of books, journals, electronic materials, theses, magazines and other reference materials to its credit. The library also has a well-equipped Computer lab with Multimedia facilities where the members can use the DVDs or Internet to get the latest news and

updates about the respective subject. Admission to the Library is currently restricted only to the students and faculty of the College.

The details of the facility available in the library of the college are furnished below:

- Total no. of volumes of books available in the library: 24286
- Total no. of Indian Journals Subscribed (Print): 45, Gratis journals: 15, Bound journals: 5914
- Total no. of Foreign Journals Subscribed (Print): 12
- Total no. of e–journals Subscribed: 12 e-journals and archives, 120 e-books, 3678 e-journals access through CeRA consortium
- Total no. of e – databases Subscribed: CABI CD ROM database
- Annual budget of the Library (approximate): 6 lakhs
- Wi-fi facility available: Yes
- No. of Computer systems available: 18
- No. of users per day (or) per month (or) per year (approximate): 80 per day
- Facilities available: Out sourcing agency functioning in the campus
- Tie-up with any other library: Nil
- Working hours of the library: 9 a.m. to 7 p.m.
- Book bank scheme for SC / ST students available: Yes
- Any other information with regard to library: Book Bank Lending Scheme and CCTV based security surveillance system available

4.3 SRI VENKATESWARA VETERINARY UNIVERSITY, TIRUPATI, ANDHRA PRADESH

The establishment of Sri Venkateswara Veterinary University was the culmination of efforts during the period, 1955 to 2006 to strengthen education and services in the fields of Veterinary Science, Dairy Technology and Fishery Science in the State of Andhra Pradesh. At present the University encompasses veterinary colleges at Tirupati, Hyderabad, Gannavaram, Proddutur, Kadapa and another in Korutla. All are involved in teaching and research at UG, PG and Doctoral level in addition to various extension works.

About the Central Library:

The libraries of S.V Agricultural College and College of Veterinary Science Tirupati were merged together on 11-08-1982 and named as ANGRAU (Acharya N.G. Ranga Agricultural University) Regional Library, Tirupati campus having 4 storied independent building which was funded by ICAR to the tune of Rs. 15 Lakhs. After establishment of Sri Venkateswara Veterinary University, the Central Library was separated from ANGRAU Regional Library and is now functioning from a new building located at college of Veterinary Science premises and was inaugurated on 31-01-2010.

The Library is under the administrative control of the Associate Dean, College of Veterinary Science, Tirupati. Central Library occupies a place of pride in College of Veterinary Science (CVSC) and is the most important place on the campus providing a safe, comfortable and friendly environment that enables learning. The main aim and mission of the Central Library is to facilitate creation of new knowledge through acquisition, organization and dissemination of knowledge resources and providing for value added services.

The Central Library is well equipped with modern facilities and resources in the form of CD-ROMs, books, e-journals abstracts, theses, etc. Links from the home page will direct you to information on library policies, hours, collections, services, sections and the location of materials. It is a store house of wealth of printed resources, including Ph.D Theses PG theses of Veterinary Sciences, can be accessed though web OPAC (Online Public Access Catalogue).

Working Hours

The library is open on weekdays from 8.00 a.m. to 6.30 p.m. (Monday to Saturday).

Electronic Surveillance System

Electronic surveillance system has been installed in the library to ensure proper safety and security of the valuable library collection. The system

consisting of IR surveillance cameras and monitors help the library administration to track the movements of the library users.

Digitization

The Library has started digitizing the previous year question papers and currently abstracts of over 100 theses had been digitized and full-text of theses and dissertations submitted after 2007 are available in digital format.

Web-Based Online Access Catalogue

The resources of the library in terms of books, back volumes of the journals, M.V.Sc. and Ph.D. theses Veterinary sciences, have been catalogued and the web-based Online Public Access Catalogue (OPAC) of the library is available at our web site.

Library Automation:

Circulation activities of the library had been automated using Total Library Software System.

The facilities available and provided are:

- Total no. of volumes of books available in the library: 9685, Theses: Journal back volumes:
- Total no. of Indian Journals subscribed (Print): 35
- Total no. of Foreign Journals subscribed (Print): 34
- Total no. of e–journals subscribed: e-journals under CeRA (ICAR)
- Total no. of e–databases subscribed: CAB Direct and Veterinary Science database
- Annual budget of the library (approximate): 39.00 lakhs
- Wi-fi facility available: No
- No. of Computer systems available: 25
- No. of users per day (or) per month (or) per year (approximate): 100 per day
- Facilities available: Photocopying, ILL facility and OPAC

- Tie-up with any other library: Nil
- Working hours of the library: 8.00 am to 6.30 pm
- Book bank scheme for SC / ST students available: Yes
- External grants received for library development: 17.00 lakhs

4.4 KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY (KVAFSU), BIDAR, KARNATAKA

History

Realizing the loss of two decades in the development of animal husbandry, dairy and fisheries under Agricultural Universities set up, the Government of Karnataka planned to establish the new Veterinary University called Karnataka Veterinary, Animal and Fisheries Sciences University on the floor of the Legislative Assembly. The Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU) was started as per the Karnataka Act No. 9 of 2004 called The Karnataka Veterinary, Animal and Fisheries University Act 2004 with its head office at Nandinagar, Bidar,Karnatakka.

Veterinary College, Hebbal, Bengaluru

The Veterinary College, Hebbal, Bangalore is the oldest of the veterinary colleges of Karnataka and has seen 100 golden years of development and achievement. The college has become the part of Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU) after its establishment in the year 2005.

Veterinary College, Hassan

The Veterinary College was started at Hassan to offer B.V.Sc. & A. H., degree with an intake 50 students, from the year 2007 onwards.

Library Facilities at KVAFSU

In order to keep up with the thirst for knowledge of the students, staff and scientists the University runs a highly equipped well stacked library. The library

functions on all days including holidays. The detailed services extended by the library with its facilities are discussed in the subsequent sections.

Veterinary College Library, Hebbal, Bengaluru

- Total no. of Volumes of books available in the library: 14773
- Total no. of Indian Journals Subscribed (Print): 43
- Total no.of Foreign Journals Subscribed (Print): 19
- Total no.of e – journals Subscribed: 350 (under CeRA)
- Annual budget of the Library (approximate): 30 lakhs
- No. of Computer systems available: 24
- No. of users per day: 250
- Facilities available: Reprographic facility available
- Working hours of the library: Mon To Fri 8.30 am to 8.00 pm, Saturdays 8.30 am to 4.00 pm & Sundays 8.30 am to 12.30 pm.
- Book bank scheme for SC / ST students available : Yes

Automation of the Library

Regional campus library automation work is completed through e-Lib Library software. Regional campus library provides the Audio- visual facility, Scanning facility & CC TV surveillance zone.

Special activities of the Library

- Reservation facility. (Sending the mail through way2 sms)
- New Arrivals Displaying
- Training Program about VET CD and BEAST CD for Students
- Training Program about JCC@CeRA
- Introduce letters to outside Libraries
- Book Bank facility for General and SC/ST Students
- Overnight book issue facility for Staff and PG Students
- e-Resource services and Printing facility.

4.5 RAJIV GANDHI INSTITUTE OF VETERINARY EDUCATION AND RESEARCH (RIVER), KURUMBAPET, PUDUCHERRY

The Rajiv Gandhi Institute of Veterinary Education and Research (RIVER) emerged as a pioneering Institute in veterinary education, research and extension in India. The Institute which has completed 20 years with a humble beginning in 1994 has grown over the years with quality veterinary education and animal welfare being its clarion call and is affiliated to the Pondicherry University, Puducherry. The Institute spread over an area of 59.21 acres at Kurumbapet, Puducherry is located about 7 kms from the main town. The campus is divided into Zone A which is the Main Campus housing the Administrative Block, Academic Blocks, Central Library, Instructional Farm Complex, Fodder Demonstration Farm, Canteen, Students' Cooperative Store and Aviary cum Fish Pond; Zone B also located at Kurumbapet has the student hostels for boys and girls, Gymnasium and the staff residential quarters. Zone C located is about 2 kms from Zone A where the Teaching Veterinary Clinical Complex (TVCC) functions. Since its inception the college has made a spectacular progress owing to the support extended by the Board of Governors and the Government of Puducherry.

Each year the Institute admits 60 students for the undergraduate course, of which 30 are admitted through the Centralized Admission Committee (CENTAC), Government of Puducherry. The remaining seats are allotted to candidates selected by the Veterinary Council of India (VCI), apart from those selected by respective Union Territories. Foreign Nationals, NRI/NRI (Non-Resident Indian) sponsored candidates are admitted based on their plus two marks and an entrance exam. The Institute is truly multi-ethnic and multinational given the fact that the students are drawn from different parts of the country and across the globe.

The Institute also offers Post Graduate Program (Master of Veterinary Science-MVSc) in eleven disciplines namely Livestock Products Technology (LPT), Veterinary and Animal Husbandry Extension Education (VAE), Veterinary Biochemistry (VBC), Veterinary Microbiology (VMC), Veterinary Pathology (VPP), Veterinary Surgery and Radiology (VSR), Veterinary Gynaecology and Obstetrics (VGO), Veterinary Medicine (VMD), Veterinary Public Health and Epidemiology

(VPE), Veterinary Parasitology (VPA), and Livestock Production and Management (LPM).

In recognition of its dedicated services in the area of Veterinary Education and Research, the University Grants Commission (UGC) has awarded 2 (F) and 12 (B) Status to the institute under the UGC Act of 1956. This recognition would enable the institute to get funds from the UGC under the Five year plan grant and from other funding agencies. The institute has added another feather to its cap with National Assessment and Accreditation Council (NAAC) awarding A Grade in April 2014.

Instructional Programme

The college has 18 academic departments with faculty strength of 49 drawn from various states who are actively engaged in teaching, research and extension. The current total strength of students is 289. RIVER alumni have excelled and are placed in some of the best institutes across the country and around the world. In rewarding meritorious students, the institute has instituted many endowments which include Government of Puducherry Chief Secretary's cash award, etc...

Library and its functions

The birth and development of the library of RIVER is synonymous with the Institution's growth. The library started functioning in the year 1994, as a part of administrative building of the college which was functioning in the 'Ponlait' (The Pondicherry Co-operative Milk Producers Union Ltd.,) premises at Kurumbapet, Puducherry. Later it was shifted to its own building in Zone A campus of the institute where a fully air-conditioned library with required books and journals, operates for the benefit of the faculty and the students.

The library functions from 9am to 5pm on all working days. The books are classified based on Universal Decimal Classification (UDC) and catalogued as per Anglo American Cataloguing Rules II (AACR II) according to the needs of the Undergraduate, Postgraduate and Faculty. The functioning is managed by an Assistant librarian and staff under him. The purchase of books and fund allotment for

the functioning of the library is monitored by the administration with Dean of the college at its Head.

Apart from the main library, there is another library which functions in the concerned departments of clinical subjects located in Teaching Veterinary Clinical Complex (TVCC) at Mettupalayam, away from the main campus, to cater the needs of the UG students in final and pre final year, PG students and the faculty of concerned clinical subjects.

The library houses a multiple collection of Books. The books pertaining to Veterinary Science as on date: 4983. In addition to this to meet the needs of the of the researchers, a collection of Indian journals (print): 25 and Foreign journals (print): 22 along with informatics sources such as VET CD and BEAST CD from 1990 to 2000. In addition to subject books, the library also holds the books on Computer science, Management and books for Competitive exams like ICAR - JRF exams and public service commissions. The library has a collection of back volumes of the most of the popular international research journals including the publications of Elsevier group till the year 2008. Also, back volumes of both foreign and Indian journals are available in the stock from 1990 to 2008.

In the year 2014 the library received a grant of Rs. 5.00 lakhs from Department of Science and Technology, under FIST (Fund for improvement of infrastructure facilities for science and technology) scheme, of which an amount of Rs. 2.50 lakhs worth books were purchased under first phase. The remaining amount of 2.50 lakhs shall be utilized for establishing e-learning centre in the library under second phase. The library also has taken efforts to rope in with UGC - INFLIBNET (University Grants Commission - Information and Library Network) centre to avail the access of e-journals through its consortium under N-LIST (National Library and Information Services Infrastructure for Scholarly Content) programme.

CHAPTER 5

ANALYSIS AND INTERPRETATION

5.0 INTRODUCTION

Data analysis has been done in accordance with the stated objectives and formulated hypotheses. There are two parts in this chapter *viz.* i) Exploratory data analysis **(5.1 – 5.4)** and ii) Testing of hypotheses **(5.5).** The results are presented in the form of tables, charts, etc. with adequate interpretation.

5.1 DEMOGRAPHIC PROFILE OF THE RESPONDENTS

This section gives the details about the gender, age, qualifications, experience etc... of the respondents and also the number of respondents spread across the South India.

5.1.1 State wise distribution of the respondents

Table 5.1 presents the state wise distribution of the respondents. Out of 678 respondents selected, 33% of respondents belong to Andhra Pradesh followed by Tamil Nadu (25.4%), Kerala (17.6%), Karnataka (15.9 %) and Puducherry (8.1%).

Table 5.1: State wise distribution of the respondents

Sl. No.	State	No. of respondents	%
1	Andhra Pradesh	224	33.0
2	Tamil Nadu	172	25.4
3	Kerala	119	17.6
4	Karnataka	108	15.9
5	Puducherry	55	8.1
	Total	**678**	**100.0**

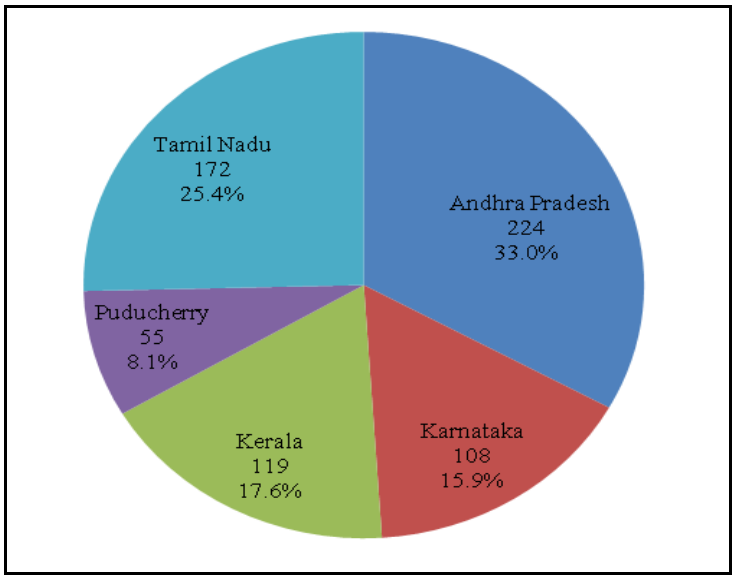


Fig. 5.1: State wise distribution of the respondents

5.1.2 Region wise distribution of the respondents

Table 5.2 shows the number of respondents working in veterinary colleges located in various regions. Out of 678 respondents, 224 respondents are from Andhra Pradesh, viz. 20 (2.9%) from Gannavaram, 64 (9.4%) from Kadappa, 33 (4.9%) from Hyderabad, 55 (8.1%) from Karim Nagar and 52 (7.7%) from Tirupati. Out of 172 respondents from Tamil Nadu, 101 (14.9%) are from Chennai, 44 (6.5%) from Namakkal, 10 (1.5%) from Orathanadu and 17 (2.5%) from Tirunelveli. There are 119 respondents from Kerala, 93 (13.7%) are from Mannuthy and 26 (3.9%) from Pookode. There are 108 respondents from Karnataka viz... 33 (4.8%) are from Hassan and 75 (11.1%) from Hebbal. There are 55 (8.1%) respondents from Union Territory of Puducherry.

Table 5.2: Region wise distribution of the respondents

Sl. No.	Region	No. of respondents	%
1	**Andhra Pradesh**		
	Gannavaram	20	2.9
	Kadappa	64	9.4
	Hyderabad	33	4.9
	Karim Nagar	55	8.1
	Tirupati	52	7.7
	Total	**224**	**33.0**
2	**Tamil Nadu**		
	Chennai	101	14.9
	Namakkal	44	6.5
	Orathanadu	10	1.5
	Thirunelveli	17	2.5
	Total	**172**	**25.4**
3	**Kerala**		
	Mannuthy	93	13.7
	Pookode	26	3.9
	Total	**119**	**17.6**
4	**Karnataka**		
	Hassan	33	4.8
	Hebbal	75	11.1
	Total	**108**	**15.9**
5	**Puducherry**	**55**	**8.1**
	Grand Total	**678**	**100.0**

5.1.3 Age wise distribution of the respondents

Table 5.3 portrays age wise distribution of the respondents. Out of 678 respondents, 213 (31.4 %) respondents are in the age group of 21-25 years, 173 (25.5%) are in the age group of 26-30 years, 90 (13.3%) respondents are in the range of 31-35 years, 63 (9.3%) respondents are between 36-40 years, 64 (9.4%) respondents are between 41-45 years, 38 (5.6%) respondents are between 46-50 years and 37 (5.5%) respondents are above 51 years of age. It is obvious from the result that almost 57 % of the respondents are under the age group of 21-30 years.

Table 5.3: Age wise distribution of the respondents

Age Group (yrs)	**No. of respondents**	**%**
21-25	213	31.4
26-30	173	25.5
31-35	90	13.3
36-40	63	9.3
41-45	64	9.4
46-50	38	5.6
51+	37	5.5
Total	**678**	**100.0**

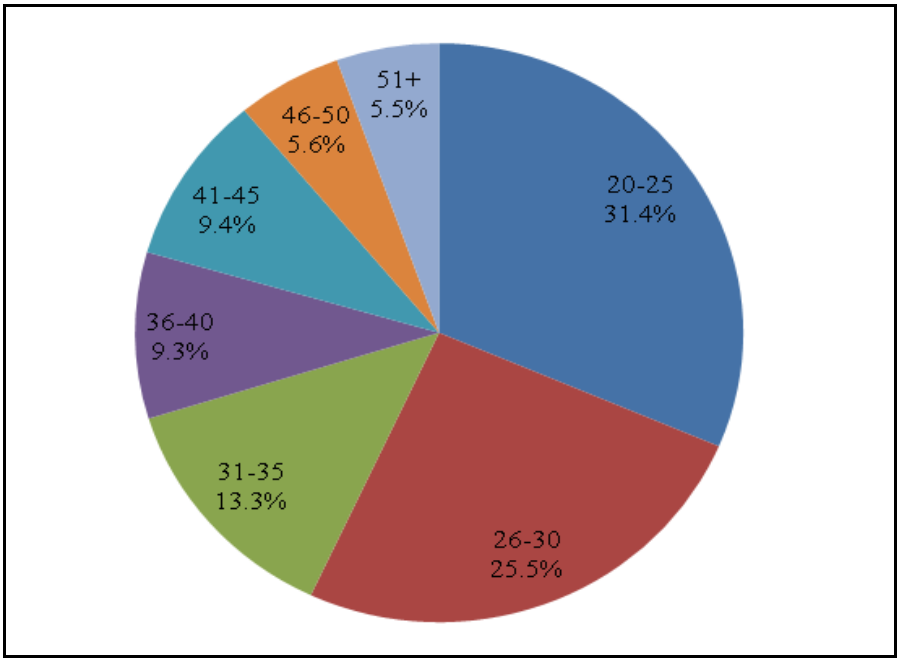


Fig. 5.2: Age wise distribution of the respondents

5.1.4 Gender wise distribution of the respondents

Table 5.4 shows that out of 678 total respondents, 431 (63.6%) are male and 247 (36.4%) are female.

Table 5.4: Gender wise distribution of the respondents

Gender	No. of respondents	%
Male	431	63.6
Female	247	36.4
Total	**678**	**100.0**

5.1.5 Educational qualification of the respondents

Table 5.5 highlights the educational qualifications of the respondents. It was observed that there are 288 (42.5%) respondents with UG degree (i.e B.V.Sc. & A. H), 228 (33.6%) with PG qualification (M.V.Sc), 159 (23.5%) with Ph.D., degree and only 3 (0.4%) veterinary professionals are qualified with Post Doctorate. The result shows that only 24% of the respondents possess Ph.D degree or above in veterinary sciences.

Table 5.5: Educational qualification of the respondents

Qualification	No. of respondents	%
B.V.Sc. & A.H.	288	42.5
M.V.Sc.	228	33.6
Ph.D.	159	23.5
Post Doctorate	3	0.4
Total	**678**	**100.0**

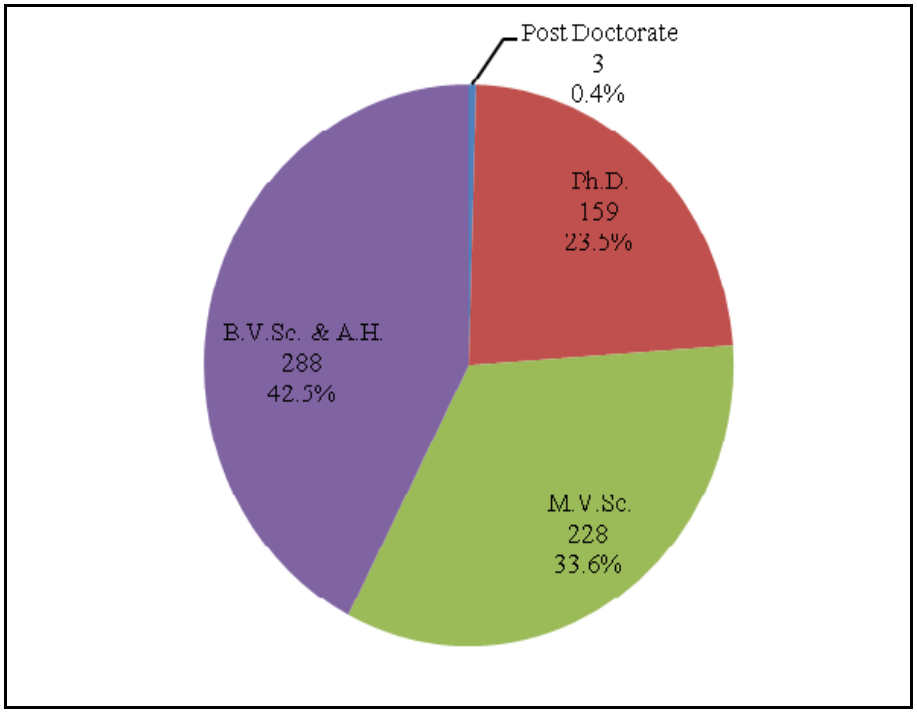


Fig. 5.3: Educational qualification of the respondents

5.1.6 Academic position of the respondents

Table 5.6 reveals that 53 (7.8%) veterinary professionals are holding the position of Professor & Head, 10 (1.5%) professionals occupying the Professor post, 39 (5.8%) professionals are in the cadre of Associate Professor and a major number of professionals (224 nos.) are in the cadre of Assistant Professor with 33% share among the total respondents. Further, it is clear from the table that within the students'

community, there are 40 (5.9%) Ph.D., scholars and a major share of 42% (285 respondents / students) are Post Graduate students and only 4% (27 respondents) are in the cadre of Teaching Assistants / Research Associates. It is inferred from the result that almost 52% of the respondents belong to teaching community, while the rest was found to be the students and research scholars.

Table 5.6: Academic position of the respondents

Designation	No. of respondents	%
Professor & Head	53	7.8
Professors	10	1.5
Associate Professors	39	5.8
Assistant Professors	224	33.0
Ph.D. Scholars	40	5.9
PG Students	285	42.0
Teaching Assistants / Research Associates	27	4.0
Total	**678**	**100.0**

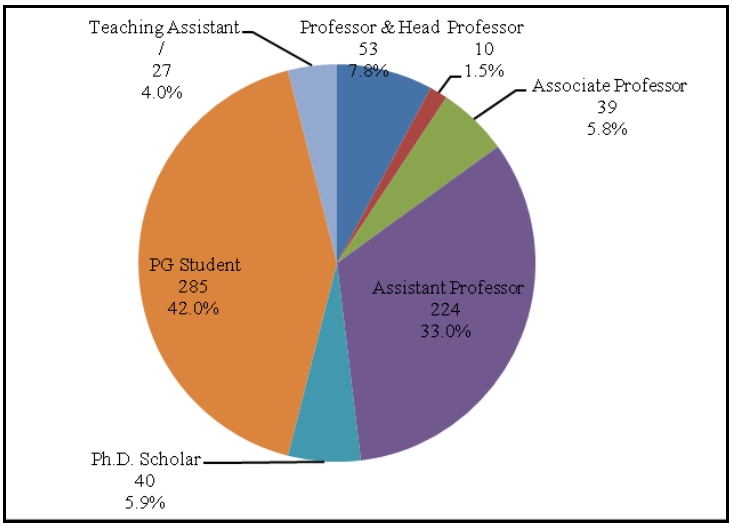


Fig. 5.4: Academic position of the respondents

5.1.7 Years of experience of the respondents

Table 5.7 shows the details of veterinary professionals' experience. It was found that out of 678, 262 (38.6%) professionals have no experience, 212 (31.3%) are having less than 5 years of experience, 62 (9.1%) are having 5 to 10 years of experience, 52 (7.7%) professionals are with 10 to 15 years of experience, 43 (6.3%) are with 15 to 20 years of experience and 47 (6.9%) professionals have more than 20 years of experience.

Table 5.7: Years of experience of the respondents

Years of Experience	No. of respondents	%
Freshers	262	38.6
0 – 5	212	31.3
5 – 10	62	9.1
10 – 15	52	7.7
15 – 20	43	6.3
20 +	47	6.9
Total	**678**	**100.0**

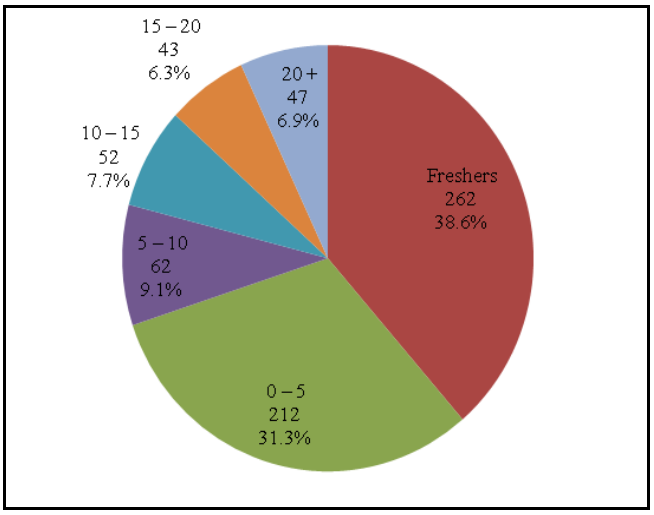


Fig. 5.5: Years of experience of the respondents

5.1.8 Work place of the respondents

Table 5.8 gives the details of the respondents' work place. There are 179 (26.4%) respondents working in veterinary universities, 497 (73.3%) respondents are working in the constituent colleges of veterinary universities and only 02 (0.03%) respondents are working in the research farms of the veterinary universities.

Table 5.8: Work place of the respondents

Work Place	No. of respondents	%
University	179	26.4
College	497	73.3
Research Station / Farm / KVK / UTRC / FTC	2	0.3
Total	**678**	**100.0**

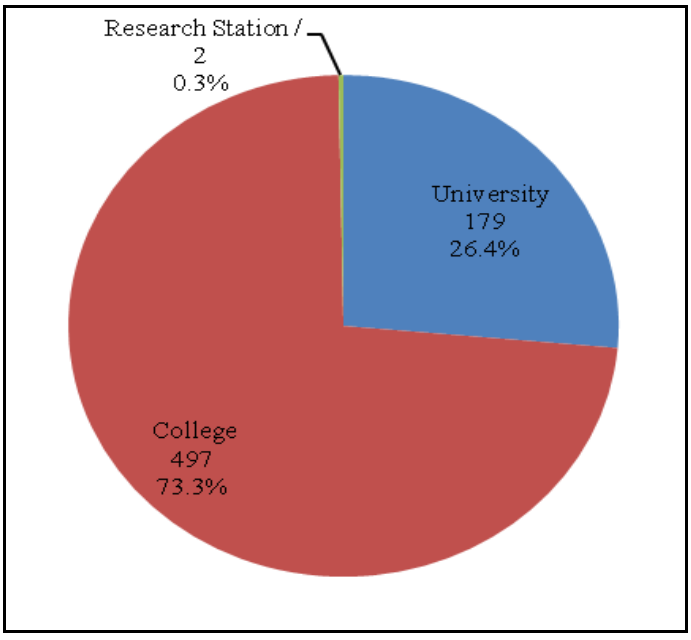


Fig. 5.6: Work place of the respondents

5.1.9 Activities of the respondents

Table 5.9 reveals the activities of the respondents. The respondents' activities are grouped into three categories viz. a) Teaching, b) Research, and c) Extension. There are 264 (38.9%) respondents who do not have any experience in teaching, 61 (9%) devote 25% of their time for teaching, 102 (15%) spent 26 % to 50% of time for teaching respectively, 134 (19.8%) spent 51% to 75% of time and 117 (17.3%) spent 76% to 100% of their time exclusively for teaching. There are 190 (28%) respondents never engaged in any type of research, 185 (27.3%) spent less than 25% of their time for research, 148 (21.8%) utilized 26% to 50% of time, 15 (2.2%) spent 51% to 75% of time and 140 (20.6%) devoted 76% to 100% of their time only in research. There are 427 (63.0%) respondents who do not have any experience in any kind of extension activities, 200 (29.5%) devoted less than 25% of their time, 44 (6.5%) spent 26% to 50% of time, 04 (0.6%) utilized 51% to 75% of time and only 03 (0.4%) devoted 76% to 100% of their time in extension activities.

It is quite encouraging that almost an equal number of respondents devoted their time exclusively for teaching (17.3%) and research (20.6%). Contrastingly, only 0.4% of respondents devoted their time for extension activities. Therefore, it is clear that majority of the respondents are work conscious in teaching and research. The respondents may be encouraged to extent their services to others in order to have societal impact through their extension activities.

Table 5.9: Activities of the respondents

Percentage (%) of time for activities	Teaching		Research		Extension	
	No. of respondents	%	No. of respondents	%	No. of respondents	%
0	264	38.9	190	28.0	427	63.0
1-25	61	9.0	185	27.3	200	29.5
26-50	102	15.0	148	21.8	44	6.5
51-75	134	19.8	15	2.2	4	0.6
76-100	117	17.3	140	20.6	3	0.4
Total	**678**	**100.0**	**678**	**100.0**	**678**	**100.0**

5.1.10 Private practice by the respondents

Table 5.10 shows the details of Private practice undertaken by the respondents. Among 678 respondents, only 59 (8.7%) respondents are involved in private practice and the rest (i.e. 619) which comes to 91.3% are not involved in private practice. Since, most of the respondents belong to teaching community, they do not want to involve in private practice.

Table 5.10: Private practice by the respondents

Private practice	No. of respondents	%
Yes	59	8.7
No	619	91.3
Total	**678**	**100.0**

5.1.11 Hours of private practice by the respondents

It is further explained in Table 5.11 that out of 59 respondents, there are 23 (39%) respondents who practice less than 2 hours per day, 30 (50.8%) are practicing 3 to 4 hours every day and 6 (10.2%) respondents only engaged more than 5 hours in private practice per day.

Table 5.11: Hours of private practice by the respondents

Hours of private practice / per day	No. of respondents	%
1-2	23	39.0
3-4	30	50.8
5+	6	10.2
Total	**59**	**100.0**

5.1.12 Number of cases attended per day during private practice by the respondents

When the respondents undertake practice, it is necessary to analyse how many cases they attend per day. Table 5.12 shows that out of 59 respondents, 33 (55.9%) respondents treat 1-5 cases per day followed by 19 (32.2%) respondents who attend 6-10 cases per day and only 07 (11.9%) respondents treat more than 10 cases per day.

Table 5.12: Number of cases attended per day during Private practice by the respondents

No. of cases attended/ day	No. of respondents	%
1-5	33	55.9
6-10	19	32.2
11+	7	11.9
Total	**59**	**100.0**

5.1.13 Membership of respondents in Professional bodies

Table 5.13 shows the respondents' professional membership in State, National and International Associations. Among 678 professionals, 128 (18.9%) professionals have enrolled themselves in one state professional association only, 103 (15.2%) have enrolled in one national association, only 3 (0.4%) professionals have membership in one international association, there are 270 (39.8%) professionals enrolled in one state level and one national level associations, 6 (0.9%) professionals have membership in state and international associations, 6 (0.9%) professionals have membership in national and international associations, 32 (4.7%) have membership in all three level associations i.e. state, national and international and there are 130 (19.2%) professionals are not at all enrolled in any professional association.

Table 5.13: Membership of the respondents in Professional bodies

Membership	No. of respondents	%
No Membership	130	19.2
State Only	128	18.9
National Only	103	15.2
International Only	3	0.4
State and National	270	39.8
State and International	6	0.9
National and International	6	0.9
All Three	32	4.7
Total	**678**	**100.0**

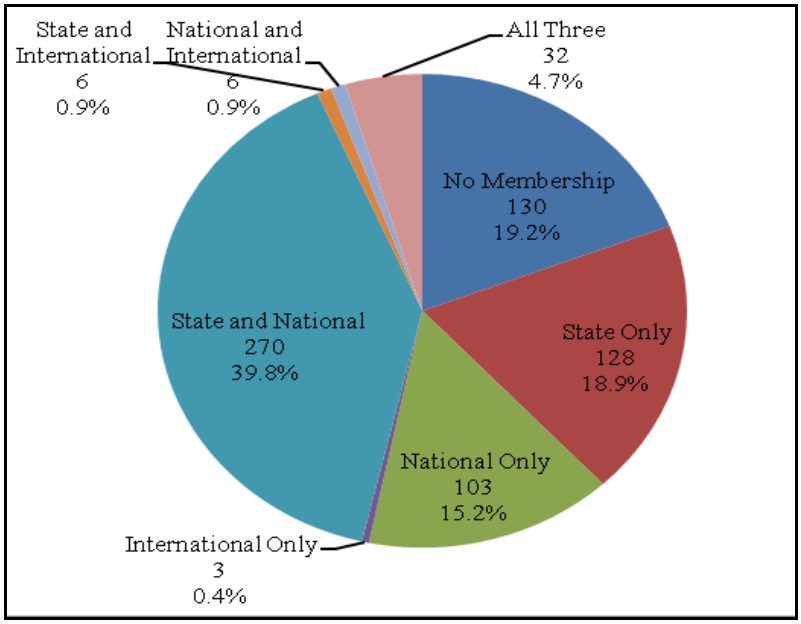


Fig. 5.7: Membership of respondents in Professional bodies

5.2 INFORMATION NEEDS / PURPOSES

The needs / purposes of seeking information by the respondents are classified into two *viz.* i. General information needs and ii. Clinical information needs.

5.2.1 General information needs of the respondents

Table 5.14 shows the general information needs of the veterinary professionals. They are classified into seven groups viz. Information needed for a) taking classes, b) updating subject knowledge, c) updating clinical knowledge, d) preparation for guest lectures/ seminars/ conferences, e) higher education, f) research publications, and g) educating the owners/ farmers.

The result indicates that out of 678 veterinary professionals, 280 (41.3%) require information always for taking classes, 221 (32.6%) need information frequently for taking classes, 136 (20.1%) require information rarely for taking classes and 41 (6.0%) never require information for this purpose. However, it was noted that with regard to taking classes, only 6 % of the respondents never sought information to take class. It may be due to their expertise in their subjects respectively. Whereas in other categories, out of 678 respondents, 412 (60.8%) respondents sought information always to update their subject knowledge, 248 (36.6%) required information frequently and 18 (2.6%) respondents required rarely for the purpose stated. Information for updating clinical knowledge was always needed for 269 (39.7%) professionals, 241 (35.5%) required information frequently, 153 (22.6%) needed information rarely and 15 (2.2%) respondents never used information for this purpose. It is seen from the result that 158 (23.3%) professionals required information always for preparation for guest lectures/ seminars/ conferences, 306 (45.1%) frequently, 197 (29.1%) rarely and 17 (2.5%) never wanted information for this purpose. For higher education purpose, 255 (37.9%) professionals needed information always and 16 (2.4%) never wanted information for the same. To undertake research 292 (43.1%) respondents need information always and there are 12 (1.8%) never wanted information for research publications. An unique phenomenon in veterinary profession than in medical or dental profession is that it is necessary to educate the animal owners / farmers in order to carry out the follow-up activities after treatment of animals. For educating the owners/ farmers, 162 (23.9%) professionals

sought information always, 246 (36.3%) frequently, 236 (34.8%) rarely and 34 (5%) professionals not at all sought information for this purpose.

Table 5.14: General information needs of the respondents

Information needed	Always	Frequently	Rarely	Never	Total
For taking classes	280 (41.3)	221 (32.6)	136 (20.1)	41 (6)	678 (100)
For updating subject knowledge	412 (60.8)	248 (36.6)	18 (2.6)	---	678 (100)
For updating clinical knowledge	269 (39.7)	241 (35.5)	153 (22.6)	15 (2.2)	678 (100)
Preparation for Guest lecture / seminars / conferences	158 (23.3)	306 (45.1)	197 (29.1)	17 (2.5)	678 (100)
For higher education	255 (37.6)	257 (37.9)	150 (22.1)	16 (2.4)	678 (100)
For research and publications	292 (43.1)	276 (40.7)	98 (14.5)	12 (1.8)	678 (100)
For educating the owners / farmers	162 (23.9)	246 (36.3)	236 (34.8)	34 (5)	678 (100)

(Figures in parentheses represent percentage)

5.2.2 Clinical information needs of the respondents

Other than the general information needs, veterinary professionals require information with regard to clinical aspects of animals such as information related to: a. causes, b. clinical signs, c. pathogenesis, d. diagnosis, e. differential diagnosis, f. treatment, g. prevention, h. follow-up, and i. emergency medicine.

Table 5.15 describes the veterinary professionals' clinical information needs. It reveals that 280 (41.3%) professionals always require information on "causes" for a disease, 232 (34.2%) frequently needed, 72 (10.6%) rarely needed and 94 (13.9%) never needed. It is inferred that 10.6 % of the respondents rarely need information and

13.9 % never need information on causes, they may try to cure but did not want to know the causes. It could be noted that among the total professionals, 323 (47.6%) always needed information on "clinical signs" of a disease, 207 (30.5%) required frequently, 55 (8.1%) rarely needed and 93 (13.7%) don't want this information. Information with regard to "pathogenesis" was always required by 226 (33.3%) professionals, 247 (36.4%) frequently needed, 105 (15.5%) rarely needed and 100 (14.7%) never wanted information for this purpose. With regard to information on "diagnosis", out of 678 respondents, 364 (53.7%) respondents always expected information on diagnosis followed by 168 (24.8%) respondents who required information on diagnosis frequently. Only 52 (7.7%) respondents were in need of diagnostic information rarely whereas 94 (13.9%) respondents never expected information on diagnosis. Out of 678 professionals, 310 (45.7%) professionals always required, 203 (29.9%) frequently required, 68 (10%) rarely required and 97 (14.3%) never required information on "differential diagnosis". When the veterinary professionals are unable to take a decision on the reason (cause) for a particular disease, they have to keep on investigating on other aspects to find out the reason for that particular disease. This process is called differential diagnosis.

With regard to information seeking on "treatment" of a disease, 354 (52.2%) professionals always wanted the information, 158 (23.3%) frequently required the information, 67 (9.9%) rarely wanted the information and 99 (14.6%) never searched for information on treatment. It is surprising that 14.6 % of the respondents never wanted to know information on treatment. The reason could be either they have ample of information on treatment or they do not have intention to search for information from the available literature on treatment. Information on "prevention" of a disease was always needed by 292 (43.1%) respondents, 210 (31%) of them frequently and 102 (15%) of them never needed this information.

Like any other professionals, veterinary professionals also require information on prevention of diseases which is the most required one. Hence, it is necessary to obtain the information on prevention of diseases. It is inferred that almost 74 % of the respondents needed information on prevention of diseases either always or frequently.

The information about "follow-up" of treatment is much needed for a doctor. Here 234 (34.5%) professionals always and 208 (30.7%) frequently needed the information for "follow-up" treatment. However, 116 (17.1%) professionals never tried for this information, because out of their experience they know the procedures to be followed after treatment of a particular disease. Regarding the information requirement on "emergency medicine", 249 (36.7%) respondents always require and 163 (24%) frequently require this information. However, almost 18% of the respondents never required this information. Since, half of the respondents in the study population are students and research scholars, they may have not come across the emergency treatment situation. It is therefore inferred that it is human or livestock, so as to save the life, the information on emergency medicine is inevitable.

Table 5.15: Clinical information needs of the respondents

Clinical information needed for	Always	Frequently	Rarely	Never	Total
Causes	280 (41.3)	232 (34.2)	72 (10.6)	94 (13.9)	678 (100)
Clinical Signs	323 (47.6)	207 (30.5)	55 (8.1)	93 (13.7)	678 (100)
Pathogenesis	226 (33.3)	247 (36.4)	105 (15.5)	100 (14.7)	678 (100)
Diagnosis	364 (53.7)	168 (24.8)	52 (7.7)	94 (13.9)	678 (100)
Differential diagnosis	310 (45.7)	203 (29.9)	68 (10)	97 (14.3)	678 (100)
Treatment	354 (52.2)	158 (23.3)	67 (9.9)	99 (14.6)	678 (100)
Prevention	292 (43.1)	210 (31)	74 (10.9)	102 (15)	678 (100)
Follow-up	234 (34.5)	208 (30.7)	120 (17.7)	116 (17.1)	678 (100)
Emergency medicine	249 (36.7)	163 (24)	146 (21.5)	120 (17.7)	678 (100)

(Figures in parentheses represent percentage)

5.3 USE OF INFORMATION SOURCES / SERVICES

5.3.1 Use of formal sources of information by the respondents

Table 5.16 explains the veterinary professionals' use of formal sources of information like textbooks, reference books, journals, conference proceedings, CIMS/ MIMS/ VET INDEX/ CIMVET, newsletters, information bulletins, drug information sheets, news papers and magazines. Out of 678 respondents, 454 (67%) respondents always used textbooks, 203 (29.9%) used frequently and 21 (3.1%) used rarely for their required information. There are 193 (28.5%) professionals who used reference books always, 317 (46.8%) used frequently and 168 (24.8%) professionals used reference books rarely for further course of treatment. It may be noted that all 678 respondents used textbooks and reference books either always or frequently or rarely. No one revealed that textbook and reference book are not at all required.

With regard to the use of journals, 180 (26.5%) respondents always used journals, 370 (54.6%) utilized this source frequently, 120 (17.7%) used rarely. It is well known fact that journal is one of the best primary sources of information which provides the scientific and research information. However, there are 1.2% of professionals never used it. These respondents may be from the students' category. Only 53 (7.8%) respondents always used conference proceedings for their reference, 213 (31.4%) required frequently, 380 (56%) rarely used this source and 32 (4.7%) never used it.

CIMS/ MIMS/ VET INDEX/ CIM VET: This source used as ready recknor by professionals with regard to drugs and its related information. 112 (16.5%) always required it, 220 (32.4%) frequently used it. More than half of the respondents (51%) either rarely used it or never used it. This source fully consists of information only on drugs and useful for professionals who deal with clinical subjects. Hence, the professionals who deal with other than clinical subjects may not require it.

Newsletter of anything brings the latest information. In this context, veterinary professionals also used the newsletter as a source of information. However, the analysis revealed that 50% of the professionals rarely used their association related newsletters and 9% of professionals never used it. This may be due to that their associations newsletters are not regularly published and not containing academic related information.

An information bulletin is one of the formal sources used to keep professionals abreast with the latest developments. 250 (36.9%) respondents frequently used and 320 (47.2%) rarely used this source.

Drug information sheets contain the details of performance / actions of various drugs, particularly the medicine already given and the medicine that continuing now. Only on the basis of this information sheet, one is able to continue to do the treatment better. It is seen from the result that out of 678 respondents, 64 (9.4%) always, 217 (32%) frequently, 316 (46.6%) rarely used drug information sheets as source of information.

Rather than any other source of information, newspaper plays a vital role in providing up-to-date information on daily basis. It is evident from the analysis that 75% of the respondents used newspaper always as source of information. However, it was observed that 5.5% never used newspaper as source of information. As far as the magazines are concerned, 68% of respondents used it either always or frequently as source of academic information.

Table 5.16: Use of formal sources of information by the respondents

Formal Sources	Always	Frequently	Rarely	Never	Total
Text books	454 (67)	203 (29.9)	21 (3.1)	0 (0)	678 (100)
Reference books (Encyclopaedia, Directories, Thesaurus etc…)	193 (28.5)	317 (46.8)	168 (24.8)	0 (0)	678 (100)
Journals	180 (26.5)	370 (54.6)	120 (17.7)	8 (1.2)	678 (100)
Conference proceedings	53 (7.8)	213 (31.4)	380 (56)	32 (4.7)	678 (100)
CIMS /MIMS/ VET INDEX/ CIMVET	112 (16.5)	220 (32.4)	287 (42.3)	59 (8.7)	678 (100)
Newsletters	60 (8.8)	223 (32.9)	337 (49.7)	58 (8.6)	678 (100)
Information bulletins	54 (8)	250 (36.9)	320 (47.2)	54 (8)	678 (100)
Drug information sheets	64 (9.4)	217 (32)	316 (46.6)	81 (11.9)	678 (100)
News papers	287 (42.3)	220 (32.4)	134 (19.8)	37 (5.5)	678 (100)
Magazines	202 (29.8)	258 (38.1)	184 (27.1)	34 (5)	678 (100)

(Figures in parentheses represent percentage)

With regard to use of formal sources of information, out of 678 veterinary professionals, 166 (24.5%) professionals always used formal sources and 249 (36.7%) respondents frequently used formal sources for their information requirements. Among the faculty, 24% (84) always used formal sources and 38% (134) frequently used formal sources of information and 18 (5%) professionals revealed that they never used formal sources of information. Among the Ph.D scholars, 28% of them always used and 39% frequently used formal sources. Among the PG students, 25% always used and 35% frequently used formal sources of information (Table 5.17).

Table 5.17: Category of respondents vs. Use of formal sources of information

Category of respondents	Always	Frequently	Rarely	Never	Total
Faculty	84 (24)	134 (38)	117 (33)	18 (5)	353 (100)
Ph. D Scholars	11 (28)	16 (39)	12 (31)	1 (2)	40 (100)
PG Students	71 (25)	100 (35)	98 (34)	17 (6)	285 (100)
TOTAL	**166** **(24.5)**	**249** **(36.7)**	**227** **(33.5)**	**36** **(5.3)**	**678** **(100)**

(Figures in parentheses represent percentage)

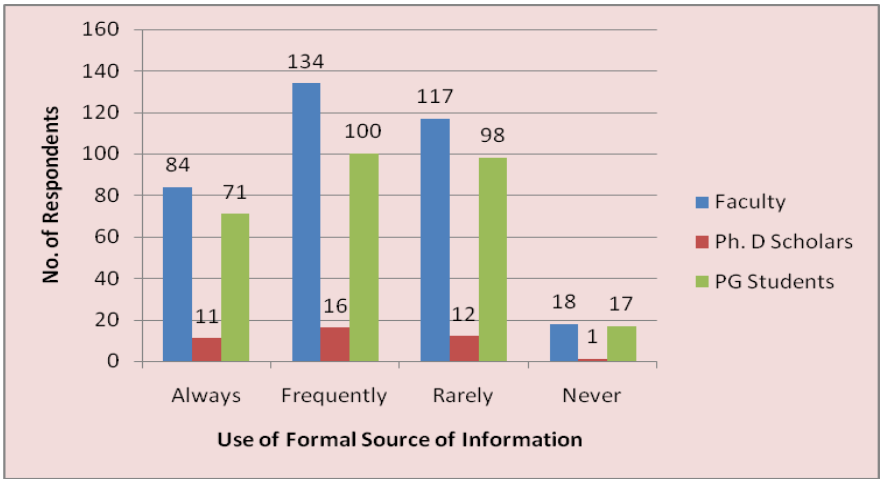


Fig. 5.8: Category of respondents vs. Use of formal sources of information

5.3.2 Use of non-print sources of information by the respondents

Veterinary professionals use non-print sources like television, radio, CDs and DVDs for their information needs. Television is the best source of providing current information. One can get information both in audio and visual modes. Every household owns a television today. It is known fact that every television channel and radio station telecast and broadcast information / programme on livestock. In this study, 208 (30.7%) professionals always and 230 (33.9%) professionals frequently used television as their information source. However, there are 27 (4%) respondents who never used television for their information needs. It is to be noted that only 27.6% of professionals used radio either always or frequently. More than half of the professionals (51.6%) rarely used and 20.8% of professionals never used radio as source of information. It is clear from the result that 114 (16.8%) respondents always used CDs and DVDs, 282 (41.6%) frequently used, 239 (35.3%) rarely used and 43 (35.3%) never used this source for seeking information. Nowadays updated and latest information about livestock are available on CDs and DVDs. This source is considered as a best source, since one may be able to read and easily make number of copies for circulation (Table 5.18).

Table 5.18: Use of non-print sources of information by the respondents

Non-print Sources	Always	Frequently	Rarely	Never	Total
Television	208 (30.7)	230 (33.9)	213 (31.4)	27 (4.0)	678 (100)
Radio	49 (7.2)	138 (20.4)	350 (51.6)	141 (20.8)	678 (100)
CDs and DVDs	114 (16.8)	282 (41.6)	239 (35.3)	43 (6.3)	678 (100)

(Figures in parentheses represent percentage)

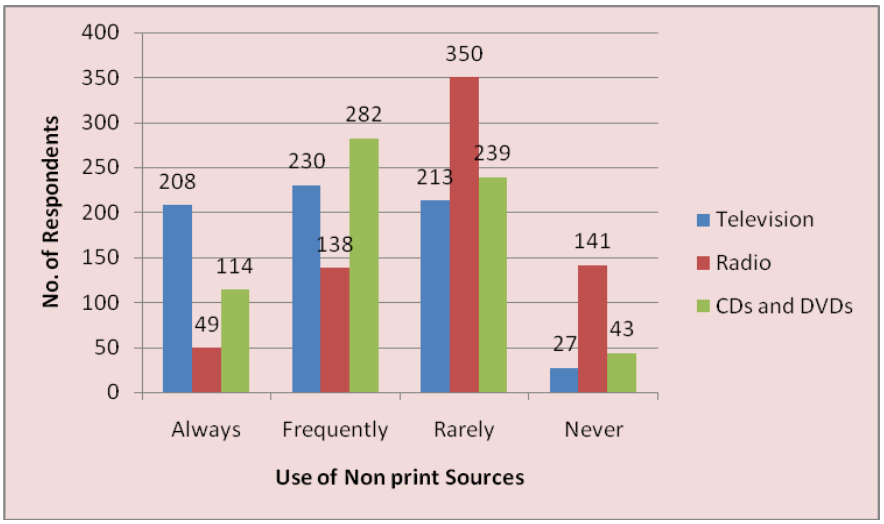


Fig. 5.9: Use of non-print sources of information by the respondents

There are 124 (18.3%) professionals always and 217 (32%) frequently used the non-print sources of information. However, 70 (10.3%) professionals never used the non-print sources of information. Faculty who used non-print sources of information always comes to 18.1% and 32.8% frequently used the sources. 32 (9%) faculty never used this source. Out of 40 Ph. D scholars, 06 (15%) scholars always used non-print sources and 16 (40%) scholars frequently used this source. Out of 285 total PG students, 54 (19%) students and 85 (30%) students always and frequently used non-print sources of information respectively (Table 5.19).

Table 5.19: Category of respondents vs. Use of non-print sources of information

Category of respondents	Always	Frequently	Rarely	Never	Total
Faculty	64 (18.1)	116 (32.8)	141 (40)	32 (9)	353 (100)
Ph. D Scholars	6 (15)	16 (40)	14 (35)	4 (10)	40 (100)
PG Students	54 (19)	85 (30)	112 (39)	34 (12)	285 (100)
TOTAL	**124 (18.3)**	**217 (32)**	**267 (39.4)**	**70 (10.3)**	**678 (100)**

(Figures in parentheses represent percentage)

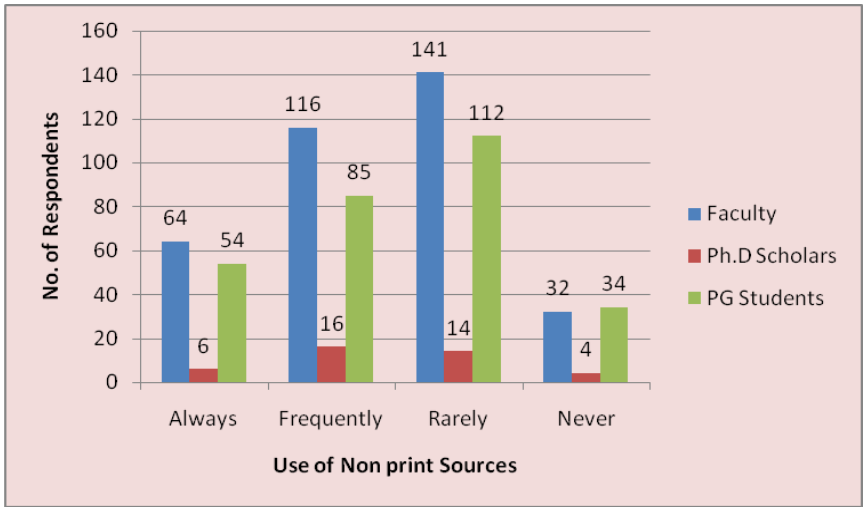


Fig. 5.10: Category of respondents vs. Use of non-print sources of information

5.3.3 Use of Online sources of information by the respondents

Nowadays online resources or information plays a vital role, because, one can get the latest, day to day and updated information from their desk itself. This is highly possible and applicable to the veterinary professionals also. Since, it is the profession one needs the information about the livestock and its related areas. Table 5.20 depicts the details about the veterinary professionals' use of online sources like e-journals, e-books, subject databases, internet sources (portals, social networking sites etc.), open access sources and discussion forum for their information needs.

E–journals provide latest information to the needy. In this study, there are 288 (42.5%) professionals always used e-journals for their information needs, 303 (44.7%) frequently used it, 79 (11.7%) rarely used it and 08 (1.2%) never used e-journals for their needs. 270 (39.8%) professionals used e-books always, 303 (44.7%) used frequently, 96 (14.2%) used rarely and 09 (1.3%) never used e-books. Needless to mention that a few respondents expressed their opinion at the time of informal interview that it was difficult to read the journals or books on computer screens. Subject database is very much essential for diagnosis, treatment and prescribing the medicine. In other words subject database provides authentic and required information. Out of 678 professionals, 131 (19.3%) of them always used their subject databases, 274 (40.4%) frequently used, 241 (35.5%) rarely used and 32 (4.7%) never used subject databases. Veterinary professionals use internet sources like web portals

of educational institutions and social networking sites like facebook, twitter etc. 361 (53.2%) professionals always used it, 244 (36%) frequently used, 64 (9.4%) rarely used and 09 (1.3%) never used it. Here, it is persistent to state that almost 90% of the respondents completely depend on internet which shows the importance of technology and its usage. When the respondents are able to get information from the latest sources / technologies, the open access sources also play its own role.

It is noted that no significant difference that exists in the pattern of usage of social networking sites among all three categories (Faculty, Ph.D. scholars & PG students) of veterinary professionals.

In most of the cases, when an e-book, e-journal, internet etc., are unable to give the required information, there the open access sources come to rescue of the respondents. There are 235 (34.7%) professionals always made use of open access sources for their information needs, 268 (39.5%) frequently used, 157 (23.2%) rarely used and 18 (2.7%) never used open access sources. Nowadays discussion on online has become an inevitable one. Because, the experts or who are capable to advise or prescribe medicine / treatment may be far away from the place where his / her service is needed. In such cases, the experts may be contacted through online for treatment. In some complex cases, the professionals used to exchange the information, their thoughts, experiences and even to have a discussion online. In this study, it is disheartening to note that more than 64% of the respondents either rarely used online discussion or never used it. It clearly shows that the respondents either do not have the awareness or do not want to use such source of information. In this context, they have to be motivated properly and regularly. The veterinary professionals use online discussion forum for exchanging the information between them. Only 64 (9.4%) always used the forum, 180 (26.5%) frequently used it, 344 (50.7%) rarely used it and 90 (13.3%) never used discussion forum for their information sharing.

Table 5.20: Use of Online sources of information by the respondents

Online Sources	Always	Frequently	Rarely	Never	Total
E- journals	288 (42.5)	303 (44.7)	79 (11.7)	8 (1.2)	678 (100)
E- books	270 (39.8)	303 (44.7)	96 (14.2)	9 (1.3)	678 (100)
Subject databases	131 (19.3)	274 (40.4)	241 (35.5)	32 (4.7)	678 (100)
Internet sources (Portals, Social networking sites etc…)	361 (53.2)	244 (36.0)	64 (9.4)	9 (1.3)	678 (100)
Open Access Sources	235 (34.7)	268 (39.5)	157 (23.2)	18 (2.7)	678 (100)
Discussion forum	64 (9.4)	180 (26.5)	344 (50.7)	90 (13.3)	678 (100)

(Figures in parentheses represent percentage)

Among all the respondents, 33.2% of them always used online sources, 38.6% of them frequently used, 24% of them rarely used and 4.1% of them never used this source. Among the total 353 faculty members, 117 (33.1%) faculty always used the online sources, 137 (38.8%) faculty used it frequently, 88 (25%) faculty used rarely and 11 (3.1%) never used this source. Among the Ph.D scholars, 40% of scholars always used online sources and 35% of scholars frequently used the source. Among the PG students, 32% of students always used online sources and 39% of students frequently used the source (Table 5.21).

Table 5.21: Category of respondents vs. Use of online sources of information

Category of respondents	Always	Frequently	Rarely	Never	Total
Faculty	117 (33.1)	137 (38.8)	88 (25)	11 (3.1)	353 (100)
Ph. D Scholars	16 (40)	14 (35)	9 (22)	1 (3)	40 (100)
PG Students	92 (32)	111 (39)	67 (24)	15 (5)	285 (100)
TOTAL	**225 (33.2)**	**262 (38.6)**	**164 (24)**	**28 (4.1)**	**678 (100)**

(Figures in parentheses represent percentage)

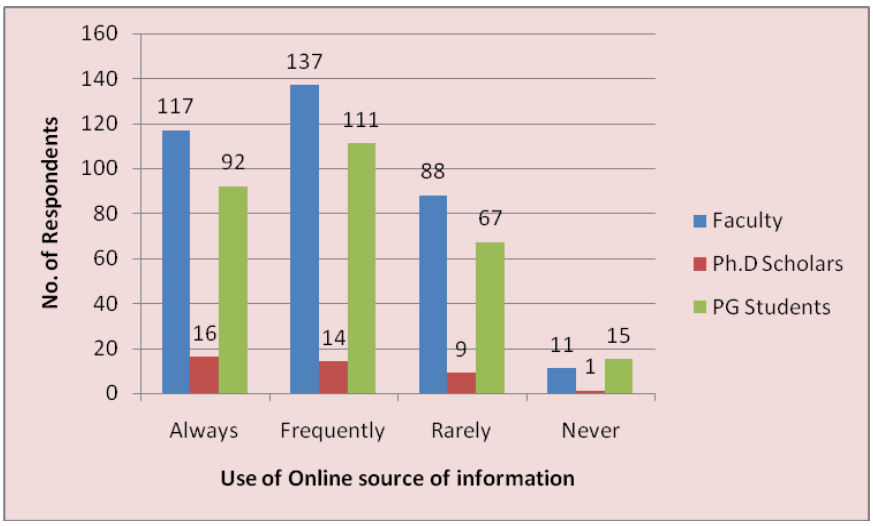


Fig. 5.11: Category of respondents vs. Use of online sources of information

5.3.4 Use of Informal sources of information by the respondents

When compared to formal sources of information, the information from informal sources is much useful to the respondents. In this study informal source of information is divided into six divisions. Table 5.22 shows the use of informal sources such as discussion with colleagues, discussion with subject experts, attending seminars/ conferences/ workshops, discussion with librarians/ discussion with medical representatives and discussion with farmers/ clients for their information needs.

Out of six options, discussion with colleagues is one of the most used informal sources of information among veterinary professionals. 317 (46.8%) respondents always used this source, 316 (46.6%) used frequently, 43 (6.3%) used rarely and only 02 (0.3%) respondents did not use this source of information. Therefore, it could be noted that 94% of the respondents used the option of discussion with colleagues as the most influential source of informal information. Discussion with subject experts is another important source next to discussion with colleagues. 199 (29.4%) respondents always discussed with subject experts, 366 (54%) frequently used this source, 111 (16.4%) rarely used and only 02 (0.3%) respondents did not try this source. It could be concluded that 83% of the respondents used to discuss with subject experts to get latest information on their fields of work. Attending Seminars / Conferences / Workshops will provide the latest information on the respective fields. Rather than reading a book or a study material, it is more convenient to listen to the experts to know the emerging trends in a field. Because during seminars and workshops one can experience the gathering of experts and academicians related to the subject. In view of the importance, about 65% of the veterinary professionals attend the seminars / conferences / workshops frequently. It is quite true that when compared to others, the well experienced librarians know very well about the latest arrivals of books, journals, news and clippings. Out of 678 professionals, 51 (7.5%) professionals always consult librarians for their information needs, 200 (29.5%) frequently consult librarians, 349 (51.5%) rarely consult and 78 (11.5%) professionals never consulted librarians for their requirements. It is evident that 88% of the respondents approached the librarians for their information needs.

Normally, when a company introduces a new medicine or new brand with old combination, the medical representatives used to approach the doctors to market their products. No doctor used to consult the medical representative to know the information. This is proved from the following:

Discussion with medical representatives is considered as informal source of information. 31 (4.6%) respondents always used and 121 (17.8%) used frequently. As discussed, it is evident from the analysis that this source was rarely used by 379 (55.9%) respondents and 147 (21.7%) respondents never discussed with medical representatives. Discussion with cattle owners / farmers: The above case is applicable to some extent here. Nearly 40% of the professionals rarely have discussion and 9% of the professionals never discussed with cattle owners / farmers. However, 51% of the professionals used to get the information from the farmers and the owners of livestock by means of discussion to know the fact and correct information.

Table 5.22: Use of Informal sources of information by the respondents

Informal Sources	Always	Frequently	Rarely	Never	Total
Discussion with colleagues	317 (46.8)	316 (46.6)	43 (6.3)	2 (0.3)	678 (100)
Discussion with subject experts	199 (29.4)	366 (54.0)	111 (16.4)	2 (0.3)	678 (100)
Attending Seminars / Conferences and Workshops	91 (13.4)	347 (51.2)	231 (34.1)	9 (1.3)	678 (100)
Discussion with the university / college librarians / library staff	51 (7.5)	200 (29.5)	349 (51.5)	78 (11.5)	678 (100)
Discussion with the medical representatives	31 (4.6)	121 (17.8)	379 (55.9)	147 (21.7)	678 (100)
Discussion with the cattle owners / farmers	102 (15.0)	242 (35.7)	274 (40.4)	60 (8.8)	678 (100)

(Figures in parentheses represent percentage)

With regard to the use of informal sources of information, only 19.5% of the professionals always used this source, 39.1% of the professionals frequently used this source, 34.1% of them rarely used this source and 7.4% of them never used this source. Out of total faculty members, only 18% of them always used informal sources, 41% of faculty frequently used, 34% of faculty used it rarely and 7% of faculty never tried to use this source. There are 25% and 47% of Ph.D scholars always and frequently used the informal sources of information respectively. Among the PG students, 21% of them always used and 37% of them frequently used the informal sources of information (Table 5.23).

- Using chi-square test, it was found that there is no significant difference among all three categories of respondents with respect to the use of formal sources, non-print sources, online sources and informal sources of information.
- Among the various sources of information, the use of non-print sources and informal sources was found to be less than the other sources.
- The Ph.D scholars used more online sources (75%) than the faculty (71.9%) and PG students (71%).
- With regard to use of formal sources of information, the Ph.D scholars (98%) used more than the faculty (95%) and PG students (94%).
- When compared to Ph.D scholars, the faculty and PG students are more in number but not using the informal sources upto the expectations.

Table 5.23: Category of respondents vs. Use of informal sources of information

Category of respondents	Always	Frequently	Rarely	Never	Total
Faculty	63 (18)	144 (41)	120 (34)	26 (7)	353 (100)
Ph. D Scholars	10 (25)	19 (47)	10 (25)	1 (3)	40 (100)
PG Students	60 (21)	105 (37)	99 (35)	21 (7)	285 (100)
TOTAL	**132** **(19.5)**	**265** **(39.1)**	**231** **(34.1)**	**50** **(7.4)**	**678** **(100)**

(Figures in parentheses represent percentage)

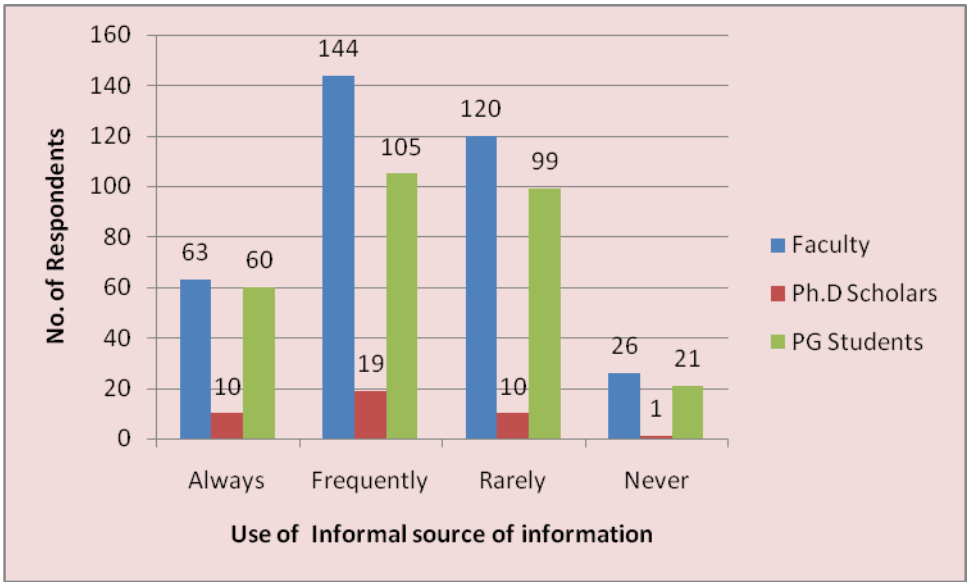


Fig. 5.12: Category of respondents vs. Use of informal sources of information

5.3.5 Discussion mode with colleagues by the respondents

To know the proper and perfect information, discussion with colleagues plays a vital role. There are certain procedures in discussion way of exchanging information. In this study, the procedures have been divided into five categories:

1. Direct contact (face-to-face) is one of the ways to have discussion with colleagues. Majority of respondents used always (63.1%) and frequently (33.2%) this source respectively. Only 25 (3.7%) respondents rarely used this source. All the respondents used to have face-to-face discussion with their colleagues to get the updated / current information in their field. No respondent revealed that it is not a required source of information.

2. 331 (48.8%) professionals never used the letter communication as a method for discussing with colleagues. However, 264 (38.9%) professionals rarely used it and only 11 (1.6%) professionals always used this source. Letter communication is least preferred by the professionals as it takes a lot of time to get reply, hence this source is almost becoming out of communication channels.

3. Next to face-to-face discussion, professionals prefer to discuss over phone / cell phone with colleagues, particularly who are working in faraway places of the

same university. 98.7% of professionals used cell phones for discussion either always or frequently or rarely. Even though cell phones have become inevitable in everybody's life, it was found that 1.3% of professionals never used cell phones for discussion with their colleagues.

4. Nowadays most of the veterinary doctors have the laptop / desktop with high speed internet connectivity. With the facility of internet, one can chat with the people whom they want to speak. Since the facility of internet is available with different network providers at affordable cost, 97% of the professionals used this source to exchange the information.

5. When a veterinary professional wants to know a piece of information / some data, he / she can use the SMS (Short Messaging Service) as a mode of delivery. Surprisingly, it was found that almost 84% of the respondents used SMS as their source of receiving and sending information. However, it is to be noted that 16% of the respondents never tried this source.

Table 5.24: Discussion mode with colleagues by the respondents

Discussion Procedure	Always	Frequently	Rarely	Never	Total
Personal contact / face-to-face	428 (63.1)	225 (33.2)	25 (3.7)	0 (0)	678 (100)
By letter	11 (1.6)	72 (10.6)	264 (38.9)	331 (48.8)	678 (100)
Over phone/ cell phone	224 (33.0)	359 (52.9)	86 (12.7)	9 (1.3)	678 (100)
E-mail	164 (24.2)	350 (51.6)	144 (21.2)	20 (2.9)	678 (100)
SMS / Chatting	129 (19.0)	261 (38.5)	177 (26.1)	111 (16.4)	678 (100)

(Figures in parentheses represent percentage)

5.3.6 Time spent per week for seeking information by the respondents

One cannot get his / her desired information from a particular place / at a particular time. To get the same, one has to go to different places at different times. Table 5.25 depicts the time spent by the veterinary professionals in a week for seeking information from their work place, personal library, institutional libraries, discussion with colleagues and subject experts and internet / online sources.

In the work place, 77 (11.4%) respondents spent more than 22 hours for seeking information per week, 76 (11.2%) respondents spent 15 hours to 21 hours for seeking information per week. Nearly half of the respondents spent less than 7 hours per week for seeking information. Sparing time for seeking information is depending upon professional's routine volume of work every day. Therefore, spending of time for information seeking varies among respondents significantly. In their personal library, only 1.3% of the respondents spent 22 hours and more to collect information per week. Whereas, almost 63% of the respondents spent less than 7 hours and there are 16% of respondents who do not have their personal library. It is known from the analysis that majority of respondents do not have sufficient reading materials as their personal collection. This could be due to ever increasing cost of reading materials. The time spent by the respondents in institutional libraries is same as indicated in the use of personal library. It was observed that majority of respondents (71.2%) spent less than 7 hours and 5.8% of respondents never visited their institutional libraries. The reason for less usage of institutional libraries may be because of non-availability latest reading materials both in print and electronic. Due to high cost of reading materials and shrinking budget, libraries are not in a position to spend more on procurement of print and online reading materials. There are 15 (2.2%) respondents who spent more than 22 hours per week for discussion with their colleagues / subject experts, 518 (76.4%) spent from 01 hour to 07 hours and 25 (3.7%) never discussed with their colleagues and subject experts. With regard to internet / online sources, 36 (5.3%) professionals spent more than 22 hours per week for seeking information, 75 (11.1%) professionals spent 15 hours to 21 hours per week, 207 (30.5%) spent 8 to 14 hours per week, 352 (51.9%) spent 1 to 7 hours and 8 (1.2%) professionals never used online sources for their academic purposes. It is clear from the analysis that all the respondents use internet / online sources regularly except for 1.2% (i.e. only 8/678) of

the respondents. On an average, more than half of the respondents use online sources for one hour per day.

Table 5.25: Time spent per week for seeking information by the respondents

Information seeking place	Time (hours) spent / per week					Total
	0	1-7	8-14	15-21	22+	
Work place	11 (1.6)	305 (45.0)	209 (30.8)	76 (11.2)	77 (11.4)	678 (100)
Personal library	107 (15.8)	425 (62.7)	113 (16.7)	24 (3.5)	9 (1.3)	678 (100)
University / College libraries	39 (5.8)	483 (71.2)	117 (17.3)	26 (3.8)	13 (1.9)	678 (100)
Discussion with colleagues / experts	25 (3.7)	518 (76.4)	99 (14.6)	21 (3.1)	15 (2.2)	678 (100)
Online resources	8 (1.2)	352 (51.9)	207 (30.5)	75 (11.1)	36 (5.3)	678 (100)

(Figures in parentheses represent percentage)

5.3.7 Convenient time of the respondents to access information

Accessing time of information depends upon the person who access it. Table 5.26 shows the convenient time for the respondents to access information during a day is classified as: Early morning, Lunch break, Evening time, Late night and No specific time.

With regard to access to formal sources of information, out of 678 professionals, 253 (37.3%) professionals are willing to access at any time (no specific time), 224 (33%) professionals prefer to access it in the early morning and 115 (17%) professionals willing to access during evening time. Here, it is noted that 37.3% of the respondents stated that there is no specific time to access the formal sources of information, because whenever they are in need of information they go for accessing the information.

Out of 678 professionals, 282 (41.6%) preferred to access non-print sources of information at any time, 191 (28.2%) preferred at evening time and 9 (1.3%) never used non-print sources. The above case is applicable here also as there are 41.6 % of the respondents revealed that they are ready to access the non-print sources of information at any time. The analysis reveals that 1.3% of respondents never used non-print sources (TV/ Radio/ CDs or DVDs). It implies that using other sources is sufficient for a few respondents, therefore they are not using the non-print sources.

The veterinary professionals use internet / online sources widely for their academic purposes. 287 (42.3%) professionals were willing to access online sources at any time, 163 (24%) preferred evening time, 115 (17%) at late night and so on. Since, one can access the internet at any time (24*7), almost 45% of the respondents used internet to get the information via online. Out of 678 professionals, 398 (58.7%) professionals preferred to use informal sources at any time, 118 (17.4%) during evening time, 73 (10.8%) during lunch break and so on. In the context of informal source of information, about 59 % of the respondents stated that they access online sources at any time. The reason is that the convenience of access to online information at anytime, anywhere they desire.

Table 5.26: Convenient time of the respondents to access information

Sources	Convenient Time						Total
	Early Morning	Lunch Break	Evening Time	Late Night	No Specific Time	Not used	
Formal sources	224 (33.0)	70 (10.3)	115 (17.0)	16 (2.4)	253 (37.3)	0 (0)	678 (100)
Non-print sources	53 (7.8)	73 (10.8)	191 (28.2)	70 (10.3)	282 (41.6)	9 (1.3)	678 (100)
Online sources	70 (10.3)	43 (6.3)	163 (24.0)	115 (17.0)	287 (42.3)	0 (0)	678 (100)
Informal sources	36 (5.3)	73 (10.8)	118 (17.4)	42 (6.2)	398 (58.7)	11 (1.6)	678 (100)

(Figures in parentheses represent percentage)

5.3.8 Sources / Modes of obtaining information by the respondents

Table 5.27 shows the different sources / methods of obtaining information. It is a known fact that all the information cannot be accessed freely. At times, the users have to pay for the information. In this context, almost 50% of the respondents subscribed to printed journals either always or frequently to access information. Nowadays, online journals are also available for reference. When users are able to access the online journals, they have many advantages viz. Any time access with easy storage facility, availability of latest / current information, and print out is not necessary. Hence, paper is not wasted and environment will be saved.

Purchase of books regularly is a good habit and it paves the way for sure success in their academic career. Among the veterinary professionals, almost 48% of them are in the habit of purchasing latest subject books regularly and 46% of them rarely purchase subject books. Only 6% of professionals do not have the habit of purchasing books on their own.

Using the library resources provides a wide range of general as well as subject related information by different modes like print sources, non-print sources, online sources, etc. Only in libraries, one can get all types of information with minimum charges or at free of cost. Making use of the institutional library is a routine one to a good professional. The result on the usage of institutional libraries, reveals that 90% of professionals always or frequently used institutional libraries and 9.3% of them used rarely. Surprisingly, there are only 5 (0.7%) professionals who revealed that they never visited their institutional libraries.

Further analysis (using chi-square test) revealed that there was significant difference ($p<0.05$) between faculty and Ph.D. scholars, faculty and PG students with regard to usage of their institutional library resources. However, it was observed that there was no significant difference between Ph.D. scholars and PG students for the same.

Membership in professional associations enables a professional to have good network with the co-professionals. In association meetings, the members are able to

come together and exchange their thoughts, experience and latest developments in their field. In this context, 53% of professionals revealed that because of their membership in associations they are able to get useful and current information regularly. Other than direct contact in association meetings, through publications such as newsletters, journals, bulletins of their association were also found to be informative and useful. However, it was identified that about 12% of professionals are not members of any association.

Availability of open access resources like e-books, e-journals, institutional repositories, courseware etc. is a boon to the entire academic, research community and other professionals. Therefore, the professionals working in veterinary universities and research centres are not exceptional. An attempt was made to seek the opinion on the use of open access resources. The result revealed that 94% of the respondents used them forever and 5.3% of professionals rarely used. Only 0.9% of the respondents revealed that they never used open access sources for their information needs.

The above pattern of usage is applicable in the case of free subject databases also. Whenever the free subject database is available irrespective of their cadre / academic position, 73% of respondents access the free subject databases on their respective subjects either always or frequently, since it is available at free of cost. However, 4.4% of them stated that they never used subject based databases.

As stated earlier that information particularly the latest information could be obtained by means of discussion with colleagues. By discussing with colleagues, one can get the latest updates happening in their respective fields and also clear his / her doubts. Colleagues are not only exchanging information but also they maintain friendship and maintain professional network with others. Discussion with colleagues is one of the best, easy and reliable sources of exchanging information. 87% of the respondents used to discuss with their colleagues either always or frequently to get information. However, 0.4% (i.e. only 3 out of 678 respondents) of them never had discussion with their colleagues to get academic information.

Experts' opinion is one of the most important sources to solve the confusion / problem, provide chances to exchange of thoughts, and to refine the idea. Expert opinion shall help explore new avenues in their respective fields, the problems and prospects involved in it. Hence, this source is considered as an important one. Because of these innate merits in experts' opinion, 73% of the respondents sought information by means of discussion with the experts. Only 7 (1%) respondents never had discussion with subject experts.

Attending workshops / conferences: The veterinary professionals attend workshops / conferences for updating their professional knowledge. 289 (42.6%) of them frequently attended workshops / conferences for discussion with experts and update their knowledge, 294 (43.4%) rarely used this source.

Medical representatives provide information bulletins / drug information sheets to the veterinary professionals at their work places. This source is also considered as one of the information source to get latest information on drugs. It contains information on core medicines, related medicines and treatment. However, the veterinary doctors do not rely on / expect the representatives to provide information, hence more than half of the professionals (52.7%) rarely had discussion with medical representatives and almost 20% of them never discussed with representatives.

Table 5.27: Sources / Modes of obtaining information by the respondents

Sources	Always	Frequently	Rarely	Never	Total
Personal subscription to printed journals	99 (14.6)	234 (34.5)	239 (35.3)	106 (15.6)	678 (100)
Personal subscription to online journals	65 (9.6)	223 (32.9)	252 (37.2)	138 (20.4)	678 (100)
Purchase of the latest books	77 (11.4)	245 (36.1)	312 (46.0)	44 (6.5)	678 (100)
Making use of the university / college library	318 (46.9)	292 (43.1)	63 (9.3)	5 (0.7)	678 (100)
Professional membership in associations	119 (17.6)	239 (35.3)	240 (35.4)	80 (11.8)	678 (100)
Access through free internet sources	408 (60.2)	228 (33.6)	36 (5.3)	6 (0.9)	678 (100)
Access through free subject data bases	241 (35.5)	254 (37.5)	153 (22.6)	30 (4.4)	678 (100)
Discussion with Colleagues	254 (37.5)	335 (49.4)	86 (12.7)	3 (0.4)	678 (100)
Discussion with Specialists	143 (21.1)	344 (50.7)	184 (27.1)	7 (1.0)	678 (100)
Attending workshops / conferences / symposia	79 (11.7)	289 (42.6)	294 (43.4)	16 (2.4)	678 (100)
Product information sheets from the medical representatives	41 (6.0)	152 (22.4)	357 (52.7)	128 (18.9)	678 (100)

(Figures in parentheses represent percentage)

5.3.9 Constraints faced by the respondents while seeking information

While seeking information, the respondents faced number of constraints. Either these constraints should be removed or necessary initiatives should be taken to sort out. While seeking information, the respondents faced 11 types of constraints as indicated in Table 5.28

Out of 678 professionals, 337 (49.7%) of them expressed that lack of time was a major constraint for them, where as 341 (50.3%) respondents said lack of time is not a constraint for them, because nowadays internet, intranet and other facilities are available everywhere. Minimum time is sufficient to browse the internet and get the required information. Hence, half of the respondents opined that lack of time is not a constraint to seek information.

To execute any type of work, awareness about such work is very much needed. Hence, almost 89% of the respondents stated that awareness is a main factor to seek information. Only 79 (11.7%) respondents opined that lack of interest is a barrier for them and majority of respondents (88.3%) said it is not a barrier for them. These respondents are fully aware of what is the nature of work involved in veterinary science at each level / for each task, and the materials and methods including necessary information required to accomplish the task.

Out of total professionals, 245 (36.1%) of them agreed that distance between work place and residence was a problem for them for seeking information. There are 231 (34.1%) respondents felt that over / enormous publication of information / literature was a problem for them. A majority of respondents (82.6%) expressed that high cost of printed books and journals was a major problem for not accessing all published literature. There are 367 (54.1%) respondents who felt that “high cost of electronic, digital and internet sources” was a barrier for them. Lack of library in the workplace was a constraint for 153 (22.6%) respondents. Inadequate personal library collection was found to be a problem for 282 (41.6%) respondents. Non availability of computer / internet facility was the major problem for 156 (23%) professionals. Lack of computer training was a hindrance for 105 (15.5%) veterinary professionals. Lack of librarians / information providers was a constraint for 164 (24.2%) professionals.

Table 5.28: Constraints faced by the respondents while seeking information

Sources	Yes	No	Total
Lack of time	337 (49.7)	341 (50.3)	678 (100)
Lack of awareness	79 (11.7)	599 (88.3)	678 (100)
Distance between workplace and residence	245 (36.1)	433 (63.9)	678 (100)
Information overload	231 (34.1)	447 (65.9)	678 (100)
High cost of books and journals	560 (82.6)	118 (17.4)	678 (100)
High cost of electronic, digital and internet sources	367 (54.1)	311 (45.9)	678 (100)
Lack of library in the workplace	153 (22.6)	525 (77.4)	678 (100)
Lack of personal library	282 (41.6)	396 (58.4)	678 (100)
Lack of computer / internet facility	156 (23.0)	522 (77.0)	678 (100)
Lack of computer training / knowledge	105 (15.5)	573 (84.5)	678 (100)
Lack of librarians / information providers	164 (24.2)	514 (75.8)	678 (100)

(Figures in parentheses represent percentage)

5.4 USE OF COMPUTER, INTERNET, E- JOURNALS AND ONLINE LIFE SCIENCE DATABASES

5.4.1 Knowledge / Skills of respondents on Computer applications

Computer is used for processing, storage and retrieval of information. To access internet and e-resources, skills on computer and its application are very essential for veterinary professionals. Table 5.29 reveals the veterinary professionals' basic computer skills such as MS office, Internet browsing, E-mail access and Social networking. The result is quite encouraging that almost all the 678 respondents are having skills on the use of MS office, Internet browsing, E-mail access. On the other hand, there are only 41 (6%) respondents not using or not having account to use social networking sites, like facebook, twitter etc.

Table 5.29: Knowledge / Skills of respondents on Computer applications

Computer Applications	Yes	No	Total
MS - Office	674 (99.4)	4 (0.6)	678 (100)
Internet Browsing	678 (100)	0 (0)	678 (100)
E-mail Access	678 (100)	0 (0)	678 (100)
Social Networking	637 (94.0)	41 (6.0)	678 (100)

(Figures in parentheses represent percentage)

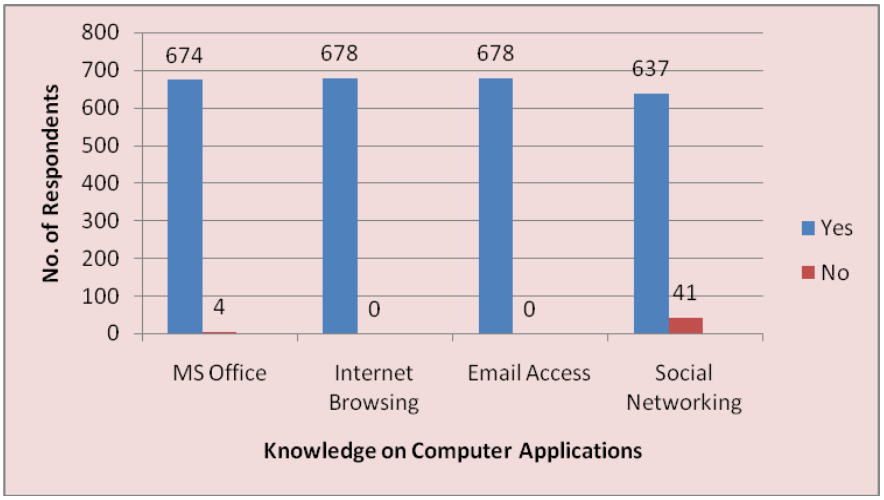


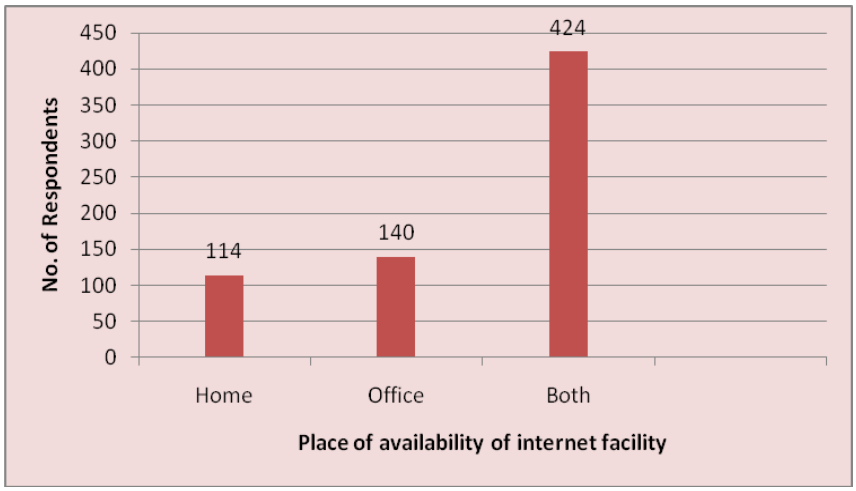
Fig. 5.13: Knowledge / Skills of respondents on Computer applications

5.4.2 Place of availability of Internet facility for the respondents

From Table 5.30, it was observed that all the 678 respondents have access to internet facility, among them 114 (16.8%) have internet facility at their home, 140 (20.6%) have at their office and the rest 424 (62.5%) have internet facility both at their home and office.

Table 5.30: Place of availability of Internet facility for the respondents

Place	No. of respondents	%
Home	114	16.8
Office	140	20.6
Both	424	62.5
Total	**678**	**100**



5.14: Place of availability of Internet facility for the respondents

5.4.3 Purpose of using internet by the respondents

Table 5.31 shows the various purposes for which internet is used by veterinary professionals. Among the total of 678 professionals, 671 (99%) used internet for checking e-mails, 341 (50.3%) for accessing online medical databases, 553 (81.6%) for accessing their subject related e-journals, 364 (53.7%) used it for chatting & recreation and 353 (52.1%) of them used internet for reading newspapers and magazines.

Table 5.31: Purpose of using internet by the respondents

Purpose	Yes	No	Total
E-mail	671 (99.0)	7 (1.0)	678 (100)
Online medical databases	341 (50.3)	337 (49.7)	678 (100)
E-journals	553 (81.6)	125 (18.4)	678 (100)
Chatting & recreation	364 (53.7)	314 (46.3)	678 (100)
Reading newspapers & magazines	353 (52.1)	325 (47.9)	678 (100)

(Figures in parentheses represent percentage)

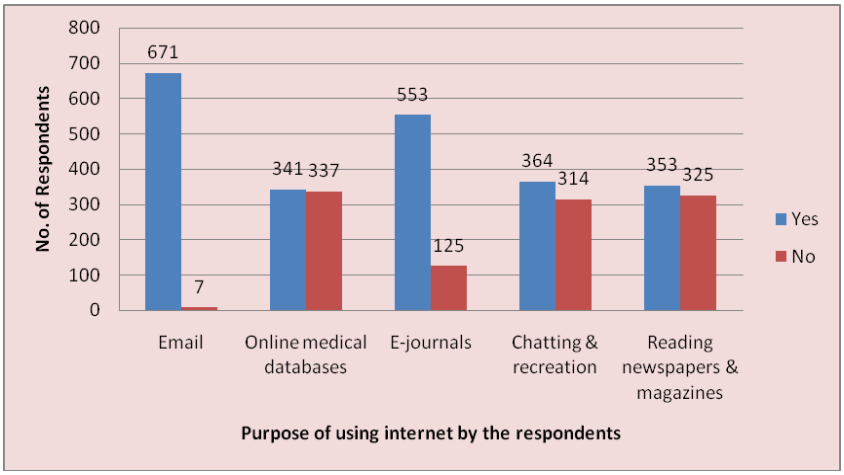


Fig. 5.15: Purpose of using Internet by the respondents

5.4.4 Search engines used by the respondents

Table 5.32 presents the result on the use of search engines by the respondents. It was found that out of various search engines, Google is the most preferred search engine with 32.7% of respondents who used it. There are 31.4% of respondents make use of two search engines (Google & Yahoo) and 35.8% of respondents used more than two search engines (Google, Yahoo & MSN etc...). The reason for using Google search engine by all the respondents could be its coverage, speed and accuracy of retrieving information. Connectivity to Google is faster than any other search engine. Availability of more number of links to the related web sites is another advantage in Google and also provision of having special features such as Google Scholar, Google Drive etc. helps browse specific information through advanced search queries and Google provides more space for individuals for information / data storage

Table 5.32: Search engines used by the respondents

Search Engine	No. of respondents	%
Google only	222	32.7
Google & Yahoo	213	31.4
Google, Yahoo & MSN	243	35.8
Total	**678**	**100.0**

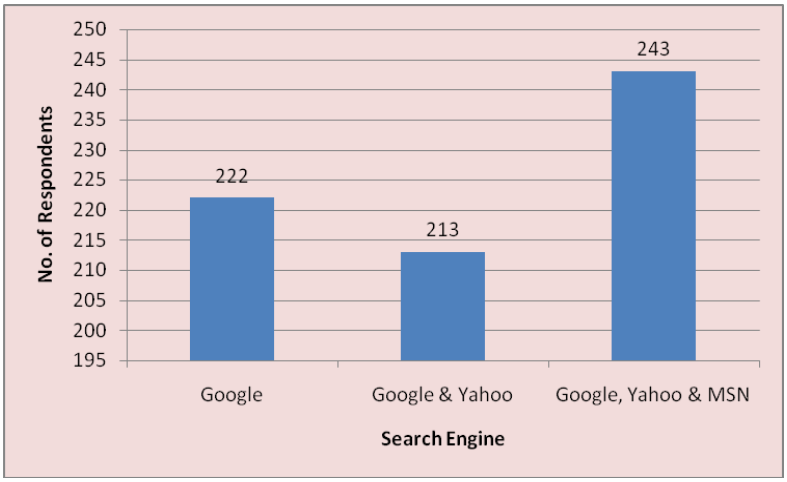


Fig. 5.16: Search engines used by the respondents

5.4.5 Purpose of having e-mail ID by the respondents

Interestingly, the use of e-mail ID by the respondents (Table 5.33), as we all know majority of the respondents (91%) used e-mails for communication purpose. However, almost half of them used it for getting subject related information and for discussing with colleagues as well. Around 25% of the respondents used it for joining a forum and 16% used for recreational purposes.

Table 5.33: Purpose of having e-mail ID by the respondents

Purpose	Yes	No	Total
To discuss with colleagues	329 (48.5)	349 (51.5)	678 (100)
To join a forum	173 (25.5)	505 (74.5)	678 (100)
For easy communication	617 (91.0)	61 (9.0)	678 (100)
For recreation	108 (15.9)	570 (84.1)	678 (100)
To get subject related information	329 (48.5)	349 (51.5)	678 (100)

(Figures in parentheses represent percentage)

5.4.6 Availability of electronic journals on the respective subject

Opinion of the respondents on the availability of electronic journals on their respective subjects revealed that 91% of the respondents were satisfied with the availability of electronic journals on their subjects. However, 9% of the respondents expressed their opinion about the non-availability of electronic journals on their subjects (Table 5.34).

Table 5.34: Availability of electronic journals on the respective subject

Availability	No. of respondents	%
Yes	617	91
No	61	9
Total	**678**	**100**

5.4.7 Place of access to electronic journals by the respondents

Since, the information is meant for office / academic purpose, more or less 40% of the respondents access to the electronic journals at their institutions followed by 38% of the respondents who used both at home and office as the place for seeking information through online. Only 13% of the respondents sought required information from home by means of online (Table 5.35).

Table 5.35: Place of access to electronic journals by the respondents

Place	No. of respondents	%
Home	91	13.4
Office	269	39.7
Both	257	37.9
Not Applicable	61	9.0
Total	**678**	**100**

5.4.8 Ranking of subject specific databases used by the respondents

Table 5.36 highlights the ranking of subject-specific databases based on their usage by the respondents. The result indicates that PubMed was found to be the most used database and put at first rank sharing 56.2% of usage by the respondents. It is quite interesting that close to 76% of the respondents made use of PubMed. The other top ranked databases include CAB Direct (11.7%), Vet Science (9.7%), Animal Production (5.3%), Vet Med Resources (2.7%), and Bio-One (1%). As far as the second top ranked databases, CAB Direct was found to be the second top by recording 25.1% of usage followed by Vet Science (21.1%), Animal Production (9.4%), Vet Med Resources (9.1%), PubMed (9%), and Bio-One (0.9%). The overall ranking of these databases in terms of their usage by veterinary professionals revealed that PubMed was found to be the most used database by the usage of 75.6% followed by the usage of other databases such as Vet Science (63.4%), CAB Direct (56.3%), Vet Med Resources (50.5%), Animal Production (48.5%), and Bio One (34.7%). It is obvious from the result that there is a considerable variation in the use of these subject-specific databases. The reasons could be due to the coverage of subjects. For instance, PubMed database covers medical and its allied subjects. Whereas, CAB Direct is meant for veterinary and its allied subjects. This scenario naturally leads to more usage due to the wide coverage of the subjects. Therefore, it is clear that subject coverage is the major factor responsible for wide usage.

Table 5.36: Ranking of subject specific databases used by the respondents

Databases	Rank							
	1	**2**	**3**	**4**	**5**	**6**	**Not Used**	**Total**
PubMed	381 (56.2)	61 (9.0)	24 (3.5)	24 (3.5)	12 (1.8)	11 (1.6)	165 (24.3)	678 (100)
CAB Direct	79 (11.7)	170 (25.1)	47 (6.9)	33 (4.9)	33 (4.9)	19 (2.8)	297 (43.8)	678 (100)
Vet Science	66 (9.7)	143 (21.1)	133 (19.6)	70 (10.3)	16 (2.4)	2 (0.3)	248 (36.6)	678 (100)
Animal Production	36 (5.3)	64 (9.4)	84 (12.4)	72 (10.6)	48 (7.1)	25 (3.7)	349 (51.5)	678 (100)
Vet Med Resources	18 (2.7)	62 (9.1)	87 (12.8)	67 (9.9)	102 (15.0)	7 (1.0)	335 (49.4)	678 (100)
Bio One	7 (1)	6 (0.9)	21 (3.1)	21 (3.1)	33 (4.9)	147 (21.7)	443 (65.3)	678 (100)

(Figures in parentheses represent percentage)

5.5: TESTING OF HYPOTHESES

This part deals with the testing of hypothesis. Based on the objectives of the study, five null hypotheses were formulated and tested in order to find out the relationship among the veterinary professionals in various states in South India with regard to their information needs, sources of information, time spent in search of information, level of ICT skills etc.

5.5.1 Hypothesis 1: Information needs of veterinary professionals

Hypothesis 1.1: General information needs of veterinary professionals

The general information needs of the veterinary professionals were grouped according to the states. The purpose for which the veterinary professionals need information was analysed for each state taken up for the study. The purposes for which information is required by the veterinary professionals are mentioned below:

a. for taking classes b. for updating subject knowledge c. for updating clinical knowledge d. for the preparation of guest lectures / seminars / conferences e. for higher education f. for research and publication and g. for educating owners / farmers.

The general information needs were analyzed using Chi-square test. The grouping variable is states (places) and test variable is general information needs of veterinary professionals mentioned in the tables below. Total no. of respondents is 678 (n = 678). Chi-square of test of significance is used at degrees of freedom (df) 12.

The following primary null hypothesis and alternative hypothesis were framed to test using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their general information needs.

H_1: There is a difference among the veterinary professionals working in various states with respect to their general information needs.

Table 5.37: States and General information needs of veterinary professionals

State & Total no. of Respondents	For taking classes				For updating subject knowledge				For updating clinical knowledge			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
AP (224)	106 (47.3)	67 (29.9)	40 (17.9)	11 (4.9)	154 (68.8)	65 (29.0)	5 (2.2)	0 (0)	106 (47.3)	68 (30.4)	48 (21.4)	2 (0.9)
KA (108)	36 (33.3)	34 (31.5)	32 (29.6)	6 (5.6)	72 (66.7)	32 (29.6)	4 (3.7)	0 (0)	53 (49.1)	34 (31.5)	20 (18.5)	1 (0.9)
KL (119)	49 (41.2)	38 (31.9)	25 (21.0)	7 (5.9)	68 (57.1)	47 (39.5)	4 (3.4)	0 (0)	39 (32.8)	58 (48.7)	22 (18.5)	0 (0)
PY (55)	29 (52.7)	16 (29.1)	5 (9.1)	5 (9.1)	29 (52.7)	26 (47.3)	0 (0)	0 (0)	18 (32.7)	22 (40.0)	14 (25.5)	1 (1.8)
TN (172)	60 (34.9)	66 (38.4)	34 (19.8)	12 (7.0)	89 (51.7)	78 (45.3)	5 (2.9)	0 (0)	53 (30.8)	59 (34.3)	49 (28.5)	11 (6.4)
Total (678)	280 (41.3)	221 (32.6)	136 (20.1)	41 (6.0)	412 (60.8)	248 (36.6)	18 (2.7)	0 (0)	269 (39.7)	241 (35.5)	153 (22.6)	15 (2.2)
Chi-square **P- value**	**20.049** **0.066^{ns}**				**18.977** **0.015***				**43.127** **0.000****			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

States and General information needs (contd.)

State & Total no. of Respondents	For the preparation of Guest Lectures / Seminars / Conferences				For higher education				For research and publication			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
AP (224)	58 (25.9)	114 (50.9)	51 (22.8)	1 (0.4)	91 (40.6)	73 (32.6)	58 (25.9)	2 (0.9)	97 (43.3)	87 (38.8)	38 (17.0)	2 (0.9)
KA (108)	28 (25.9)	39 (36.1)	38 (35.2)	3 (2.8)	46 (42.6)	32 (29.6)	27 (25.0)	3 (2.8)	51 (47.2)	38 (35.2)	19 (17.6)	0 (.0)
KL (119)	29 (24.4)	53 (44.5)	35 (29.4)	2 (1.7)	39 (32.8)	60 (50.4)	17 (14.3)	3 (2.5)	51 (42.9)	51 (42.9)	13 (10.9)	4 (3.4)
PY (55)	11 (20.0)	20 (36.4)	20 (36.4)	4 (7.3)	17 (30.9)	21 (38.2)	14 (25.5)	3 (5.5)	14 (25.5)	31 (56.4)	9 (16.4)	1 (1.8)
TN (172)	32 (18.6)	80 (46.5)	53 (30.8)	7 (4.1)	62 (36.0)	71 (41.3)	34 (19.8)	5 (2.9)	79 (45.9)	69 (40.1)	19 (11.0)	5 (2.9)
Total (678)	158 (23.3)	306 (45.1)	197 (29.1)	17 (2.5)	255 (37.6)	257 (37.9)	150 (22.1)	16 (2.4)	292 (43.1)	276 (40.7)	98 (14.5)	12 (1.8)
Chi-square **P- value**	**23.971** **0.021***				**22.259** **0.035***				**19.292** **0.082ns**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

States and General information needs (contd.)

State & Total no. of Respondents	For Educating the owners / farmers			
	1	**2**	**3**	**4**
AP (224)	58 (25.9)	82 (36.6)	78 (34.8)	6 (2.7)
KA (108)	43 (39.8)	39 (36.1)	25 (23.1)	1 (0.9)
KL (119)	19 (16.0)	52 (43.7)	43 (36.1)	5 (4.2)
PY (55)	13 (23.6)	16 (29.1)	19 (34.5)	7 (12.7)
TN (172)	29 (16.9)	57 (33.1)	71 (41.3)	15 (8.7)
Total (678)	162 (23.9)	246 (36.3)	236 (34.8)	34 (5.0)
Chi-square	**45.366**			
P- value	**0.000****			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

The test shows that no significant difference exists among the veterinary professionals of various states with respect to their general information needs; for taking classes and for their research and publications with chi-square value 20.049 (p value 0.066) and chi-square value 19.292 (p value 0.082), respectively.

Since, the syllabi are on par with other universities or almost the same, the preparation to take classes does not differ. Because, either to take class or to conduct research or to publish papers all are able to get same information. Hence, the difference does not exist.

However, there is a significant difference existing among the veterinary professionals of various states with respect to their general information needs; for updating subject knowledge (p value 0.015 at 5% level), for updating clinical knowledge is significant (p value 0.000 at 1% level), information requirement for preparation of guest lectures / seminars / conferences is varying among the scientists (p value 0.021 at 5% level), for higher education and for educating the owners / farmers; there is a difference that exists among the scientists (p value 0.000 at 1% level).

To update the subject knowledge, clinical knowledge, to prepare for lectures/ seminars/ conferences, to prepare for higher education and to educate the owners/ farmers there is a significant difference that exists among the respondents.

Because, updating knowledge and its methods varies from individual to individual. In the case of clinical knowledge also it differs, since the clinical knowledge depends upon the experience and the cases faced by the veterinary professionals.

Though the topic may be the same for the lectures/ seminars/ conferences but mode of preparation and presentation differs definitely. Here, it is important that a note or power point or any other material prepared by an

individual takes different angle and mode of presentation. Hence, difference exists here.

When a professional prepares for his higher education, there is a much possibility of preparation. Because, preparation for higher education is purely based on attitude and aptitude of the individual, hence, difference exists.

In the case of veterinary profession, apart from treatment, they have to educate the owners of the cattle and the farmers who are the owners of livestock. When the farmers rear the livestock, they have to be educated basically in a different way since they may be uneducated or illiterate or follow the traditional methods of treatment and some owners may be educated but do not have awareness regarding the cattle rearing. Hence, the mode of educating the farmers / owners depends upon the skill / capability of the veterinary professionals. Hence, there is a difference.

On the whole, out of seven variables, the difference exists among five variables, therefore the alternative hypothesis is accepted and in the context of other two variables there is no difference that exists, hence the same is rejected.

Hypothesis 1.2: Clinical information needs of veterinary professionals

The clinical information needs of the veterinary professionals were grouped according to the states and the results are presented in the following tables. The purposes for which the veterinary professionals need information is analyzed for each state taken up for the study. The purposes for which clinical information is required by the veterinary professionals are mentioned below:

a. for causes b. for clinical signs c. for pathogenesis d. for diagnosis e. for differential diagnosis f. for treatment g. for prevention h. for follow-up medicine and i. for emergency medicine.

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their clinical information needs.

H_1: There is a difference among the veterinary professionals working in various states with respect to their clinical information needs.

Table 5.38: States and Clinical information needs of veterinary professionals

State & Total no. of Respondents	Causes				Clinical Signs				Pathogenesis			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
AP (224)	96 (42.9)	68 (30.4)	22 (9.8)	38 (17.0)	108 (48.2)	63 (28.1)	17 (7.6)	36 (16.1)	79 (35.3)	75 (33.5)	32 (14.3)	38 (17.0)
KA (108)	55 (50.9)	26 (24.1)	13 (12.0)	14 (13.0)	62 (57.4)	20 (18.5)	11 (10.2)	15 (13.9)	42 (38.9)	30 (27.8)	22 (20.4)	14 (13.0)
KL (119)	43 (36.1)	61 (51.3)	11 (9.2)	4 (3.4)	62 (52.1)	44 (37.0)	9 (7.6)	4 (3.4)	43 (36.1)	56 (47.1)	16 (13.4)	4 (3.4)
PY (55)	24 (43.6)	17 (30.9)	5 (9.1)	9 (16.4)	24 (43.6)	18 (32.7)	4 (7.3)	9 (16.4)	17 (30.9)	18 (32.7)	9 (16.4)	11 (20.0)
TN (172)	62 (36.0)	60 (34.9)	21 (12.2)	29 (16.9)	67 (39.0)	62 (36.0)	14 (8.1)	29 (16.9)	45 (26.2)	68 (39.5)	26 (15.1)	33 (19.2)
Total 678)	280 (41.3)	232 (34.2)	72 (10.6)	94 (13.9)	323 (47.6)	207 (30.5)	55 (8.1)	93 (13.7)	226 (33.3)	247 (36.4)	105 (15.5)	100 (14.7)
Chi-square	**32.595**				**27.004**				**28.388**			
P- value	**0.001****				**0.008****				**0.005****			

(Numbers in parentheses refer percentage)

** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

States and Clinical information needs (contd.)

State & Total no. of Respondents	Diagnosis				Differential diagnosis				Treatment			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
AP (224)	122 (54.5)	48 (21.4)	18 (8.0)	36 (16.1)	104 (46.4)	59 (26.3)	25 (11.2)	36 (16.1)	120 (53.6)	48 (21.4)	22 (9.8)	34 (15.2)
KA (108)	65 (60.2)	23 (21.3)	7 (6.5)	13 (12.0)	51 (47.2)	30 (27.8)	13 (12.0)	14 (13.0)	65 (60.2)	17 (15.7)	12 (11.1)	14 (13.0)
KL (119)	61 (51.3)	45 (37.8)	8 (6.7)	5 (4.2)	54 (45.4)	48 (40.3)	10 (8.4)	7 (5.9)	66 (55.5)	33 (27.7)	15 (12.6)	5 (4.2)
PY (55)	38 (69.1)	5 (9.1)	3 (5.5)	9 (16.4)	30 (54.5)	15 (27.3)	1 (1.8)	9 (16.4)	28 (50.9)	10 (18.2)	4 (7.3)	13 (23.6)
TN (172)	78 (45.3)	47 (27.3)	16 (9.3)	31 (18.0)	71 (41.3)	51 (29.7)	19 (11.0)	31 (18.0)	75 (43.6)	50 (29.1)	14 (8.1)	33 (19.2)
Total(678)	364 (53.7)	168 (24.8)	52 (7.7)	94 (13.9)	310 (45.7)	203 (29.9)	68 (10.0)	97 (14.3)	354 (52.2)	158 (23.3)	67 (9.9)	99 (14.6)
Chi-square	**34.063**				**20.588**				**27.737**			
P- value	**0.001****				**0.057^{ns}**				**0.006****			

(Numbers in parentheses refer percentage)

** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

States and Clinical information needs (contd.)

State & Total no. of Respondents	Prevention				Follow-up				Emergency medicine			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
AP (224)	91 (40.6)	72 (32.1)	23 (10.3)	38 (17.0)	89 (39.7)	68 (30.4)	29 (12.9)	38 (17.0)	90 (40.2)	50 (22.3)	43 (19.2)	41 (18.3)
KA (108)	57 (52.8)	25 (23.1)	11 (10.2)	15 (13.9)	50 (46.3)	29 (26.9)	13 (12.0)	16 (14.8)	45 (41.7)	22 (20.4)	25 (23.1)	16 (14.8)
KL (119)	50 (42.0)	43 (36.1)	18 (15.1)	8 (6.7)	36 (30.3)	42 (35.3)	32 (26.9)	9 (7.6)	39 (32.8)	40 (33.6)	29 (24.4)	11 (9.2)
PY (55)	25 (45.5)	14 (25.5)	7 (12.7)	9 (16.4)	14 (25.5)	16 (29.1)	11 (20.0)	14 (25.5)	17 (30.9)	14 (25.5)	9 (16.4)	15 (27.3)
TN (172)	69 (40.1)	56 (32.6)	15 (8.7)	32 (18.6)	45 (26.2)	53 (30.8)	35 (20.3)	39 (22.7)	58 (33.7)	37 (21.5)	40 (23.3)	37 (21.5)
Total (678)	292 (43.1)	210 (31.0)	74 (10.9)	102 (15.0)	234 (34.5)	208 (30.7)	120 (17.7)	116 (17.1)	249 (36.7)	163 (24.0)	146 (21.5)	120 (17.7)
Chi-square	**17.695**				**36.285**				**20.485**			
P- value	**0.125^{ns}**				**0.000****				**0.058^{ns}**			

(Numbers in parentheses refer percentage)

** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

The test shows that there is no significant difference that exists among the veterinary professionals of various states with respect to their clinical information needs; for differential diagnosis with chi-square value of 20.588 (p value 0.057), for prevention with chi-square value of 17.695 (p value 0.125) and for emergency medicine with chi-square value of 20.485 (p value 0.058). However, there is a significant difference existing among the veterinary professionals of various states with respect to their clinical information needs; for causes with p value of 0.001 at 1% level, for clinical signs with p value of 0.008 at 1% level, for pathogenesis with p value of 0.005 at 1% level, for diagnosis with p value of 0.001 at 1% level, for treatment with p value of 0.006 at 1% level and for follow-up treatment with p value of 0.000 at 1% level.

While discussing about the clinical information needs, nine types of different information were needed. Out of these nine information need, in the context of three there are no significant variations that exist among the veterinary professionals of different states. They are differential diagnosis, prevention and emergency medicine. Because, the information on prevention, differential diagnosis and emergency medicine the respondents seek same sort of information. Hence, the difference does not exist. Whereas, the information on causes for diseases, clinical signs, pathogenesis, diagnosis, treatment and follow-up treatment there is a vast difference existing among the veterinary professionals. The causes for diseases, clinical signs and pathogenesis may differ from area to area and animal to animal. Hence, the information on these things may vary. In the case of diagnosis, treatment and follow up treatment, the mode or system of these things may vary from doctor to doctor. So, the information on these also differs from one to another. Hence, the variation exists. The same is established by the test of chi-square. Hence, the hypothesis is partially accepted and partially rejected.

5.5.2 Hypothesis 2: Average time spent per week for information seeking at various locations

The following hypothesis was tested using One-Way Analysis of Variance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their average duration of time utilized in search of information.

H_1: There is a difference among the veterinary professionals working in various states with respect to their average duration of time utilized in search of information.

Table 5.39: Average time spent per week for seeking information at various locations

State	Average time spent per week for seeking information at				
	Work Place	Personal Library	Univ. Library	Discussion Colleagues	Online Resources
Andhra Pradesh(224)	12.36	4.46	4.85	4.46	7.60
Karnataka (108)	8.79	5.06	5.94	5.352	7.76
Kerala (119)	11.03	5.29	6.40	6.013	11.23
Puducherry (55)	9.80	4.78	3.58	5.345	8.67
Tamil Nadu (172)	10.52	3.98	5.69	4.73	8.85
Total (678)	10.88	4.61	5.40	5.015	8.67
F-Value	2.413	1.444	3.129	1.630	4.863
P Value	0.048^{*}	0.218^{ns}	0.014^{*}	0.165^{ns}	0.001^{**}

* significant at 5% level; ** significant at 1% level; ns - not significant

As noted earlier, a particular time has been devoted by the respondents to seek information from various locations. The various locations were divided into five places.

To find out the difference between the respondents of different states and places from where the respondents sought information, one way analysis of variance (ANOVA) is applied.

There is a significant difference existing between the workplace and the respondents of different states / places (at 1% level of significance). Since the place of work and availability of time differ from person to person, the difference exists.

With regard to time spent at the personal library, the difference does not exist, because one can spend the limited time only in the library, either before work or after work alone they are able to spend their time to seek information at the personal library. Since, all the respondents spent almost equal average time, hence there is no difference that exists. It is evident from the value of F 1.444 with the P value 0.218 which is not significant.

In the context of university library, average time spent per week for information seeking differs significantly (F 3.129 and P value 0.014). The reason is that if the expected book / material is available one can spend more time in the library otherwise they may not use the library sources. Since, the availability of those sources varies significantly.

Time spent on discussion with colleagues also provides information. But there is a time limit to have a discussion. In most of the cases, the respondents used to spend more or less equal time with their colleagues for discussion, there is no significant difference exists. It is evident from the value of F 1.630 and P value 0.165.

With regard to time spent on seeking information from various locations, online resources play a vital role. Hence, there should be a vast difference between the users, when they spend time on online sources.

Hence, the hypothesis is partially accepted and partially rejected.

5.5.3 Hypothesis 3: Extent of dependence on various sources of information

Hypothesis 3.1: Dependence on formal sources of information

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their formal sources of information.

H_1: There is a difference among the veterinary professionals working in various states with respect to their formal sources of information.

Table 5.40: Dependence on formal sources of information

State & Total no. of Respondents	Text Books				Reference Books				Journals			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	166	53	5	0	76	100	48	0	48	132	40	4
	(74.1)	(23.7)	(2.2)	(0)	(33.9)	(44.6)	(21.4)	(0)	(21.4)	(58.9)	(17.9)	(1.8)
KA (108)	67	35	6	0	34	49	25	0	29	56	22	1
	(62.0)	(32.4)	(5.6)	(0)	(31.5)	(45.4)	(23.1)	(0)	(26.9)	(51.9)	(20.4)	(0.9)
KL (119)	82	35	2	0	41	51	27	0	44	61	13	1
	(68.9)	(29.4)	(1.7)	(0)	(34.5)	(42.9)	(22.7)	(0)	(37.0)	(51.3)	(10.9)	(0.8)
PY (55)	38	15	2	0	10	32	13	0	10	32	12	1
	(69.1)	(27.3)	(3.6)	(0)	(18.2)	(58.2)	(23.6)	(0)	(18.2)	(58.2)	(21.8)	(1.8)
TN (172)	101	65	6	0	32	85	55	0	49	89	33	1
	(58.7)	(37.8)	(3.5)	(0)	(18.6)	(49.4)	(32.0)	(0)	(28.5)	(51.7)	(19.2)	(0.6)
Total (678)	454	203	21	0	193	317	168	0	180	370	120	8
	(67.0)	(29.9)	(3.1)	(0)	(28.5)	(46.8)	(24.8)	(0)	(26.5)	(54.6)	(17.7)	(1.2)
Chi-square	**14.356**				**19.519**				**16.181**			
P- value	**0.073^{ns}**				**0.012***				**0.183^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Dependence on formal sources of information (contd.)

State & Total no. of Respondents	Conference Proceedings				CIMS / MIMS / VET INDEX / CIMVET				Newsletters			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	18	80	115	11	34	73	97	20	19	80	107	18
	(8.0)	(35.7)	(51.3)	(4.9)	(15.2)	(32.6)	(43.3)	(8.9)	(8.5)	(35.7)	(47.8)	(8.0)
KA (108)	8	28	66	6	21	27	55	5	7	41	54	6
	(7.4)	(25.9)	(61.1)	(5.6)	(19.4)	(25.0)	(50.9)	(4.6)	(6.5)	(38.0)	(50.0)	(5.6)
KL (119)	13	43	60	3	24	46	43	6	14	35	57	13
	(10.9)	(36.1)	(50.4)	(2.5)	(20.2)	(38.7)	(36.1)	(5.0)	(11.8)	(29.4)	(47.9)	(10.9)
PY(55)	4	20	28	3	12	15	20	8	5	12	31	7
	(7.3)	(36.4)	(50.9)	(5.5)	(21.8)	(27.3)	(36.4)	(14.5)	(9.1)	(21.8)	(56.4)	(12.7)
TN (172)	10	42	111	9	21	59	72	20	15	55	88	14
	(5.8)	(24.4)	(64.5)	(5.2)	(12.2)	(34.3)	(41.9)	(11.6)	(8.7)	(32.0)	(51.2)	(8.1)
Total (678)	53	213	380	32	112	220	287	59	60	223	337	58
	(7.8)	(31.4)	(56.0)	(4.7)	(16.5)	(32.4)	(42.3)	(8.7)	(8.8)	(32.9)	(49.7)	(8.6)
Chi-square	**14.793**				**19.768**				**9.742**			
P- value	**0.253^{ns}**				**0.072^{ns}**				**0.639^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Dependence on formal sources of information (contd.)

State & Total no. of Respondents	Information Bulletin				Drug Information Sheets				News Papers			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	26	92	89	17	25	71	113	15	99	62	49	14
	(11.6)	(41.1)	(39.7)	(7.6)	(11.2)	(31.7)	(50.4)	(6.7)	(44.2)	(27.7)	(21.9)	(6.3)
KA (108)	5	48	49	6	9	35	61	3	39	46	21	2
	(4.6)	(44.4)	(45.4)	(5.6)	(8.3)	(32.4)	(56.5)	(2.8)	(36.1)	(42.6)	(19.4)	(1.9)
KL (119)	10	42	58	9	11	40	51	17	52	32	27	8
	(8.4)	(35.3)	(48.7)	(7.6)	(9.2)	(33.6)	(42.9)	(14.3)	(43.7)	(26.9)	(22.7)	(6.7)
PY (55)	4	12	34	5	6	16	23	10	24	20	7	4
	(7.3)	(21.8)	(61.8)	(9.1)	(10.9)	(29.1)	(41.8)	(18.2)	(43.6)	(36.4)	(12.7)	(7.3)
TN (172)	9	56	90	17	13	55	68	36	73	60	30	9
	(5.2)	(32.6)	(52.3)	(9.9)	(7.6)	(32.0)	(39.5)	(20.9)	(42.4)	(34.9)	(17.4)	(5.2)
Total (678)	54	250	320	54	64	217	316	81	287	220	134	37
	(8.0)	(36.9)	(47.2)	(8.0)	(9.4)	(32.0)	(46.6)	(11.9)	(42.3)	(32.4)	(19.8)	(5.5)
Chi-square	**21.957**				**34.038**				**14.350**			
P- value	**0.038***				**0.001****				**0.279^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Dependence on formal sources of information (contd.)

State & Total no. of Respondents	Magazines			
	1	2	3	4
AP (224)	75	85	51	13
	(33.5)	(37.9)	(22.8)	(5.8)
KA (108)	31	49	26	2
	(28.7)	(45.4)	(24.1)	(1.9)
KL (119)	35	37	40	7
	(29.4)	(31.1)	(33.6)	(5.9)
PY (55)	11	23	18	3
	(20.0)	(41.8)	(32.7)	(5.5)
TN (172)	50	64	49	9
	(29.1)	(37.2)	(28.5)	(5.2)
Total (678)	202	258	184	34
	(29.8)	(38.1)	(27.1)	(5.0)
Chi-square	**13.331**			
P- value	**0.345^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Formal sources of information consist of ten things. Use of such resources may vary from individual to individual and place to place (State to State). To identify the difference between the respondents of different states, chi-square test was used.

With regard to text books, journals, CIMS / VET INDEX, newspapers and magazines, conference proceedings and newsletters, there is no difference among the users from different study area, since the values of chi-square are not significant at any level.

Because, whoever and whenever, the respondents used to seek information from the above resources, one can get the same and unique information. The reason is that the information about a particular thing in the above does not differ and it is not possible (for example, text books, journals, conference proceedings contain same information). That is the reason why the difference does not exist.

In the context of reference books, information bulletins and drug information sheets there is a significant difference that exists.

The use of reference books may differ from one individual to another. The information bulletins and drug information sheets definitely differ from doctor to doctor, medical representative to medical representative and area to area particularly states to states. Therefore, the difference exists.

Hence, some of the sub hypotheses have been accepted while some of the sub hypotheses have been rejected.

Hypothesis 3.2: Dependence on non-print sources of information

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their dependence on non-print sources.

H_1: There is a difference among the veterinary professionals working in various states with respect to their dependence on non-print sources.

Table 5.41: Dependence on non-print sources of information

State & Total no. of Respondents	Television				Radio				CDs and DVDs			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	69	73	74	8	14	40	125	45	42	103	63	16
	(30.8)	(32.6)	(33.0)	(3.6)	(6.3)	(17.9)	(55.8)	(20.1)	(18.8)	(46.0)	(28.1)	(7.1)
KA (108)	36	37	34	1	12	34	52	10	23	38	44	3
	(33.3)	(34.3)	(31.5)	(0.9)	(11.1)	(31.5)	(48.1)	(9.3)	(21.3)	(35.2)	(40.7)	(2.8)
KL (119)	28	47	34	10	8	26	47	38	16	54	41	8
	(23.5)	(39.5)	(28.6)	(8.4)	(6.7)	(21.8)	(39.5)	(31.9)	(13.4)	(45.4)	(34.5)	(6.7)
PY (55)	22	17	14	2	3	7	29	16	8	25	20	2
	(40.0)	(30.9)	(25.5)	(3.6)	(5.5)	(12.7)	(52.7)	(29.1)	(14.5)	(45.5)	(36.4)	(3.6)
TN (172)	53	56	57	6	12	31	97	32	25	62	71	14
	(30.8)	(32.6)	(33.1)	(3.5)	(7.0)	(18.0)	(56.4)	(18.6)	(14.5)	(36.0)	(41.3)	(8.1)
Total (678)	208	230	213	27	49	138	350	141	114	282	239	43
	(30.7)	(33.9)	(31.4)	(4.0)	(7.2)	(20.4)	(51.6)	(20.8)	(16.8)	(41.6)	(35.3)	(6.3)
Chi-square	**15.112**				**33.716**				**17.168**			
P- value	**0.235^{ns}**				**0.001****				**0.143^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

One can get the information and use it through the non-print sources also. Here, three sources were considered as non-print sources, i.e. Television, Radio and CDs / DVDs.

When chi-square test was applied, it is clear from the value that there is no significant difference that exists between the respondents of the different states and the use of non-print sources of information. Because, whenever we use the CD / DVD the information is the same and the television telecast is also the same but with different language. Hence, the difference does not exist.

Whereas in the context of Radio, since numbers of broadcasting stations are more, the respondents are able to hear different programmes with different information. Therefore, there is a significant difference that exists.

Hence, some of the sub hypotheses have been accepted while some of the sub hypotheses have been rejected.

Hypothesis 3.3: Dependence on online sources of information

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their dependence on online sources of information.

H_1: There is difference among the veterinary professionals working in various states with respect to their dependence on online sources of information.

Table 5.42: Dependence on online sources of information

State & Total no. of Respondents	E-Journals				E-Books				Subject Databases			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	90	105	26	3	86	105	30	3	49	94	70	11
	(40.2)	(46.9)	(11.6)	(1.3)	(38.4)	(46.9)	(13.4)	(1.3)	(21.9)	(42.0)	(31.3)	(4.9)
KA (108)	43	48	16	1	36	47	22	3	16	41	46	5
	(39.8)	(44.4)	(14.8)	(0.9)	(33.3)	(43.5)	(20.4)	(2.8)	(14.8)	(38.0)	(42.6)	(4.6)
KL (119)	63	46	10	0	61	48	10	0	27	46	42	4
	(52.9)	(38.7)	(8.4)	(0)	(51.3)	(40.3)	(8.4)	(0)	(22.7)	(38.7)	(35.3)	(3.4)
PY (55)	14	27	12	2	14	32	7	2	11	26	16	2
	(25.5)	(49.1)	(21.8)	(3.6)	(25.5)	(58.2)	(12.7)	(3.6)	(20.0)	(47.3)	(29.1)	(3.6)
TN (172)	78	77	15	2	73	71	27	1	28	67	67	10
	(45.3)	(44.8)	(8.7)	(1.2)	(42.4)	(41.3)	(15.7)	(0.6)	(16.3)	(39.0)	(39.0)	(5.8)
Total (678)	288	303	79	8	270	303	96	9	131	274	241	32
	(42.5)	(44.7)	(11.7)	(1.2)	(39.8)	(44.7)	(14.2)	(1.3)	(19.3)	(40.4)	(35.5)	(4.7)
Chi-square	**21.538**				**24.187**				**9.480**			
P- value	**0.043***				**0.019***				**0.661^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Dependence on online sources of information (contd.)

State & Total no. of Respondents	Internet Sources				Open Access Sources				Discussion Forum			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	116	78	26	116	73	94	52	5	27	59	111	27
	(51.8)	(34.8)	(11.6)	(51.8)	(32.6)	(42.0)	(23.2)	(2.2)	(12.1)	(26.3)	(49.6)	(12.1)
KA (108)	53	40	13	53	31	45	29	3	9	35	55	9
	(49.1)	(37.0)	(12.0)	(49.1)	(28.7)	(41.7)	(26.9)	(2.8)	(8.3)	(32.4)	(50.9)	(8.3)
KL (119)	56	53	9	56	42	47	28	2	13	28	62	16
	(47.1)	(44.5)	(7.6)	(47.1)	(35.3)	(39.5)	(23.5)	(1.7)	(10.9)	(23.5)	(52.1)	(13.4)
PY (55)	30	20	4	30	18	18	15	4	3	11	30	11
	(54.5)	(36.4)	(7.3)	(54.5)	(32.7)	(32.7)	(27.3)	(7.3)	(5.5)	(20.0)	(54.5)	(20.0)
TN (172)	106	53	12	106	71	64	33	4	12	47	86	27
	(61.6)	(30.8)	(7.0)	(61.6)	(41.3)	(37.2)	(19.2)	(2.3)	(7.0)	(27.3)	(50.0)	(15.7)
Total (678)	361	244	64	9	235	268	157	18	64	180	344	90
	(53.2)	(36.0)	(9.4)	(1.3)	(34.7)	(39.5)	(23.2)	(2.7)	(9.4)	(26.5)	(50.7)	(13.3)
Chi-square	**12.723**				**12.257**				**11.963**			
P- value	**0.389^{ns}**				**0.425^{ns}**				**0.449^{ns}**			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Due to the technological advancement and the development in the field of information technology, the professionals nowadays use more of online resources. Here, online sources are categorized into six.

To identify the difference between the use of sources of information through online and the respondents of different states, chi-square test was applied.

Out of six sources, there is no significant difference existing among the respondents of the various states by means of subject databases, internet sources, open access sources and discussion forum.

Because, in most cases subject databases are available at free of cost. The same is applicable to other cases also (internet sources and open access sources). With regard to discussion forum, people are using this media for a minimum time till today. Because the respondents stated that they do not get satisfaction or get the complete clarification by discussion through the means of online.

But there is a significant difference existing in the context of e-journals and e-books. To access them, one has to subscribe or buy to browse the particular sites. In certain cases, the users have to pay in terms of Dollars / Euros. Hence, theory of 'capability to purchase' plays a vital role. The capacity to purchase differs from one individual to another. Hence, there is a significant difference that exists in this context.

Therefore, the formulated hypothesis is accepted partially and rejected partially.

Hypothesis 3.4: Dependence on informal sources of information

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their dependence on informal sources of information.

H_1: There is a difference among the veterinary professionals working in various states with respect to their dependence on informal sources of information.

Table 5.43: Dependence on informal sources of information

State & Total no. of Respondents	Discussion with colleagues				Discussion with subject experts				Attending Seminars / Conferences / Workshops			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	95	111	18	0	62	132	30	0	39	123	59	3
	(42.4)	(49.6)	(8.0)	(0)	(27.7)	(58.9)	(13.4)	(0)	(17.4)	(54.9)	(26.3)	(1.3)
KA (108)	57	45	6	0	29	57	22	0	9	54	44	1
	(52.8)	(41.7)	(5.6)	(0)	(26.9)	(52.8)	(20.4)	(0)	(8.3)	(50.0)	(40.7)	(0.9)
KL (119)	60	54	5	0	46	57	16	0	22	63	34	0
	(50.4)	(45.4)	(4.2)	(0)	(38.7)	(47.9)	(13.4)	(0)	(18.5)	(52.9)	(28.6)	(0)
PY (55)	25	27	2	1	19	22	13	1	7	22	24	2
	(45.5)	(49.1)	(3.6)	(1.8)	(34.5)	(40.0)	(23.6)	(1.8)	(12.7)	(40.0)	(43.6)	(3.6)
TN (172)	80	79	12	1	43	98	30	1	14	85	70	3
	(46.5)	(45.9)	(7.0)	(0.6)	(25.0)	(57.0)	(17.4)	(0.6)	(8.1)	(49.4)	(40.7)	(1.7)
Total (678)	317	316	43	2	199	366	111	2	91	347	231	9
	(46.8)	(46.6)	(6.3)	(0.3)	(29.4)	(54.0)	(16.4)	(0.3)	(13.4)	(51.2)	(34.1)	(1.3)
Chi-square	**12.074**				**20.625**				**27.003**			
P- value	**0.440^{ns}**				**0.056^{ns}**				**0.008****			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Dependence on informal sources of information (contd.)

State & Total no. of Respondents	Discussion with University / College librarians / library staff				Discussion with medical representatives				Discussion with farmers / clients			
	1	2	3	4	1	2	3	4	1	2	3	4
AP (224)	18	74	96	36	12	43	133	36	40	80	88	16
	(8.0)	(33.0)	(42.9)	(16.1)	(5.4)	(19.2)	(59.4)	(16.1)	(17.9)	(35.7)	(39.3)	(7.1)
KA (108)	2	27	68	11	1	22	70	15	22	51	31	4
	(1.9)	(25.0)	(63.0)	(10.2)	(0.9)	(20.4)	(64.8)	(13.9)	(20.4)	(47.2)	(28.7)	(3.7)
KL (119)	16	31	61	11	9	27	65	18	17	36	61	5
	(13.4)	(26.1)	(51.3)	(9.2)	(7.6)	(22.7)	(54.6)	(15.1)	(14.3)	(30.3)	(51.3)	(4.2)
PY (55)	3	14	34	4	2	8	26	19	10	18	15	12
	(5.5)	(25.5)	(61.8)	(7.3)	(3.6)	(14.5)	(47.3)	(34.5)	(18.2)	(32.7)	(27.3)	(21.8)
TN (172)	12	54	90	16	7	21	85	59	13	57	79	23
	(7.0)	(31.4)	(52.3)	(9.3)	(4.1)	(12.2)	(49.4)	(34.3)	(7.6)	(33.1)	(45.9)	(13.4)
Total (678)	51	200	349	78	31	121	379	147	102	242	274	60
	(7.5)	(29.5)	(51.5)	(11.5)	(4.6)	(17.8)	(55.9)	(21.7)	(15.0)	(35.7)	(40.4)	(8.8)
Chi-square	**26.815**				**41.095**				**47.633**			
P- value	**0.008****				**0.000****				**0.000****			

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level; ns - not significant

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

Apart from formal sources of information, the respondents depend on informal sources of information also. The informal sources have been divided in to six categories.

To find out the difference between the respondents of various states and their dependence on informal sources of information, chi-square test was applied.

Out of six components, there is no significant difference existing between the respondents and discussion with colleagues and discussion with subject experts. Because, these things almost happen in the same way. Therefore, the difference does not exist. It is evident from the F value and df of variables concerned.

Whereas the other four variables such as attending seminars, discussion with library staff, with medical representatives and with farmers / owners differ significantly (at 1% level and 5% level), from state to state and respondent to respondent. Another important point to be noted is that these variables depend on the attitude and interest to assess the information. Hence, the difference exists.

Therefore, some of the sub hypotheses have been accepted while some of the other sub hypotheses have been rejected.

5.5.4 Hypothesis 4: Use of Library facilities

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the veterinary professionals working in various states with respect to their usage of library facilities.

H_1: There is a difference among the veterinary professionals working in various states with respect to their usage of library facilities.

Table 5.44: Use of library / library staff by the respondents

State & Total no. of Respondents	Discussion with Library staff				Use of University / College Library				Lack of library in workplace	
	1	2	3	4	1	2	3	4	Yes	No
AP (224)	18 (8.0)	74 (33.0)	96 (42.9)	36 (16.1)	125 (55.8)	81 (36.2)	18 (8.0)	0 (.0)	164 (73.2)	60 (26.8)
KA (108)	2 (1.9)	27 (25.0)	68 (63.0)	11 (10.2)	42 (38.9)	55 (50.9)	11 (10.2)	0 (.0)	77 (71.3)	31 (28.7)
KL (119)	16 (13.4)	31 (26.1)	61 (51.3)	11 (9.2)	51 (42.9)	50 (42.0)	15 (12.6)	3 (2.5)	97 (81.5)	22 (18.5)
PY (55)	3 (5.5)	14 (25.5)	34 (61.8)	4 (7.3)	16 (29.1)	29 (52.7)	9 (16.4)	1 (1.8)	41 (74.5)	14 (25.5)
TN (172)	12 (7.0)	54 (31.4)	90 (52.3)	16 (9.3)	84 (48.8)	77 (44.8)	10 (5.8)	1 (.6)	146 (84.9)	26 (15.1)
Total (678)	51 (7.5)	200 (29.5)	349 (51.5)	78 (11.5)	318 (46.9)	292 (43.1)	63 (9.3)	5 (.7)	525 (77.4)	153 (22.6)
Chi-square	**26.815**				**30.490**				**11.469**	
P - value	**0.008****				**0.002****				**0.022***	

(Numbers in parentheses refer percentage)

* significant at 5% level; ** significant at 1% level

1- Always 2- Frequently 3- Rarely 4- Never

AP- Andhra Pradesh KA – Karnataka KL – Kerala PY – Puducherry TN – Tamil Nadu

In the context of making use of the university or college library, there is a vast difference among veterinary professionals. It is proved from the value of Chi-square = 30.490, df =12, and p = 0.002 which is significant at 5% level. The reason for difference is simple, because, the library facility available in the colleges may be less than the universities.

In the case of discussion with the librarian / library staff in the colleges / universities, there is a vast difference among veterinary professionals. At the university, the library personnel are more in number, hence, there is a possibility of difference in this context. This is proved by the value of Chi-square = 26.815, df = 12, and p = 0.008 which is significant at 5% level.

At all colleges / universities libraries are available, but the required / expected facilities may not be available. Therefore, there is a significant difference existing in this aspect. It is clear from the value of Chi-square = 11.469, df = 4, p = 0.022

Hence, the alternate hypothesis is accepted.

5.5.5 Hypothesis 5: Information needs for research purpose by respondents

The following hypothesis was tested using Chi-square test of significance.

H_0: There is no difference among the academic position of the veterinary professionals with respect to their research productivity.

H_1: There is a difference among the academic position of the veterinary professionals with respect to their research productivity.

Table 5.45: Information needs for research purpose by various category of the respondents

Designation	Information needs for Research & publication			
	Always	Frequently	Rarely	Never
Teachers (353)	164 (46.5)	154 (43.6)	32 (9.1)	3 (0.8)
PhD Scholars (40)	20 (50.0)	17 (42.5)	3 (7.5)	0 (0)
PG Students (285)	108 (37.9)	105 (36.8)	63 (22.1)	9 (3.2)
Total (678)	292 (43.1)	276 (40.7)	98 (14.5)	12 (1.8)

(Numbers in parentheses refer percentage)

Chi-Square = 30.448 p= 0.000** Significant at 1% level

Research is the first and foremost aspect of the respondents. Here, three classifications are given. For PhD scholars, information needs for research and publication are mandatory for their thesis submission according to the regulations laid down by the University Grants Commission (UGC).

For teacher respondents, there are two important things which necessitate to carry out research are: i) it is a must for the university teachers to publish research articles to get the next stage of promotion and ii) if they get Ph.D research degree, they are entitled to get additional monetary benefits.

Whereas in the context of the PG students, information need for research and publication is less than the teachers and research scholars. To identify the difference between them, chi-square test was applied. From the value of chi-square = 30.448 and p value = 0.000, it is evident that there is a significant difference among the groups. Hence, the hypothesis H_0 is rejected.

Further analysis (using chi-square test) revealed that there was no significant difference between faculty and Ph.D. scholars with regard to usage of information for their research and publications. Further, it was observed that there was significant difference between the faculty and PG students.

However, there was no significant difference that exists between Ph.D. scholars and PG students with regard to usage of information for their research and publications.

CHAPTER 6

DISCUSSION

6.0 INTRODUCTION

This chapter provides a detailed discussion of the variables based on the findings of the study. An attempt has been made to correlate the similar or contrast findings of earlier studies mentioned in chapter 1 and chapter 2. The discussion presented below has laid emphasis on each objective individually.

We are living in an era of digital information and all fields of science are rapidly advancing in technology and manpower resources. The rapid ease with which information is shared and the progress that is made in the field of veterinary and animal sciences prompted the current study. The aim of the study was to understand how information was shared for knowledge growth in the academics of veterinary science and the role of institutional libraries. The study was spread across the veterinary institutes of the four Southern Indian States *viz.* Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and the Union Territory of Puducherry. Questionnaires were prepared and more so, specifically on the source areas of data retrieval and distributed. The respondents were the pedagogy, doctoral students and post graduate students.

The questionnaires were distributed to a total of 802 individuals, of which 678 responded measuring a response rate of 85%. Of the 678, 431 were men (63.6%) and 247 women (36.4%), a probable indicator of veterinary science being a male dominant profession. State wise grouping revealed that one-third (33%) of the respondents were from Andhra Pradesh, given the fact that the number of veterinary institutes were five, unlike the others which had lesser number on comparison. Based on age wise classification, it was observed that nearly 56.9% of the respondents were below 30 years of age, which may be attributed to respondents being young professionals who have had the opportunity to pursue a career in veterinary science because of 14 veterinary institutes that are located in South India.

Of the 325 number of student respondents, the doctoral students accounted for 40 and the graduate students were 285. The less number of 40 would probably indicate that students pursue their doctoral degree either as in-service faculty or a few candidates prefer pursuing their research interests and goals.

Since British rule, all veterinary colleges were part of Agricultural Universities. Of late, separate Veterinary Universities are being formed and this involves constituent veterinary colleges, university training & research centers, farmers' training centres (FTC), Krishi Vigyan Kendra (KVK) etc. Of these, majority of the respondents (73.3%) are working in veterinary colleges. Given the huge investments in infrastructure facilities and research projects, it was observed in this study that respondents were involved higher in research activities on comparison with teaching and extension activities, the study revealed that 20% of the respondents were actively and solely engaged in research, a slight reduction in respect of teaching (17.3%) and much less respondents were solely engaged in extension (0.4%).

6.1 ANALYZING VARIOUS INFORMATION NEEDS OF THE RESPONDENTS

As stated earlier, the information need of the respondents has been categorized into two such as general information needs and clinical information needs. As far as the General Information Needs are concerned, Information for updating 'subject knowledge' and for 'research and publications' were the most wanted needs (60% and 43% respectively) of the respondents. At the cutting edge of research and in the interest of the subject, the above mentioned needs have taken precedence over the other options. As the subject of teaching involves reading extensively from standard textbooks, while the students prefer to rummage in their pursuit of academic excellence, the respondents percentage of 41.3% and 37.6% for 'taking classes' and for 'higher education' sums up the requirements. The least preferred need was 'preparation for guest lectures / seminars / conferences'. The fact that 6% and 5% respondents never wanted information for 'taking classes' and 'educating the owners / farmers' respectively is a reminder that the concerned respondents were seasoned professionals and whose experience was immensely rich.

With regard to Clinical Information Needs, Clinical signs, diagnosis, differential diagnosis and treatment are the core of veterinary practice and as per this study, the percentage of respondents searching information for the above were 47.6%, 53.7%, 45.7% and 52.2% respectively. These indicate that the core values for rendering a fair practice fall on much study, for a meaningful treatment of the disease. Prevention of disease and elimination of the causative agents are strategic measures adopted by clinicians and it was observed that 43.1% and 41.3% respectively of the respondents always require information on the same. Between 13.7% - 17.7% of the respondents had no desire to seek information on emergency medicine, follow-up treatment, prevention, pathogenesis, treatment, differential diagnosis, diagnosis and clinical signs. While no specific reason could be assigned for the same, again it could be plausible that they were clinicians with vast experience and no possible threat of emerging new diseases.

It is quite encouraging that the result of first objective coincides with an earlier study conducted by Lal, Kaur, and Kumar in 2012, revealed that majority of the faculty members wanted information to handle classes, to guide researchers besides updating their knowledge in order to fulfill the changing needs of the students. Also the pertinent problem in information seeking was found to be the scatter of information in a variety of sources.

6.2 ASSESSMENT OF AWARENESS AND USE OF VARIOUS SOURCES OF INFORMATION

Sources of information are of different kinds such as formal sources, informal sources, non-print sources, online sources. Each of these types has been assessed separately seeking opinion from the respondents.

The result of the use of formal sources revealed that during the period of study it was observed that the formal sources of information were the most wanted. The percentage of respondents was 67%, (textbooks), 42.3% (newspapers), 29.8% (magazines), 28.5% (reference books) and 26.5% (journals). From the above, it can be inferred that the print media still hold a strong bastion in retrieval of information. Use of non-print sources witnessed that 30.7% and 33.9% of respondents, ‘always’ and ‘frequently’ used television for seeking professional information. Only 7.2%

respondents always used radio and 20.8% respondents never used radio for their professional needs. This would mean that since time slots are game changers in multimedia, professionals cannot afford to wait till the schedule is drawn and even if drawn, might leave the seeker disappointed as his area of curiosity may not be quenched.

In this electronic age of communication, the role of online sources of information is gaining more importance day-by-day. Use of online sources like E-journals, E-books, Social networking sites like Facebook, Twitter, WhatsApp etc. have started making inroads in the scholastic areas. Particularly, e-journals and e-books are the boon for those who have unlimited sources of internet and have access to paid journals. Use of informal sources indicates that personal rapport had established itself in bridging gaps in academic grey areas, as evidenced by 'discussion with colleagues' being 46.8% always and 46.6% frequently, 'discussion with subject experts' is a second preference (29.4% always and 54% frequently). Attending seminars / conferences / workshops was always preferred by 91 (13.4%) respondents and frequently used by 347 (51.2%) respondents.

As it can be seen in any study, Kakai et al (2004) found that the students preferred lecture notes and handouts. Textbooks were found to be the most used source of information. The other sources include theses/ dissertations, reference materials, newspapers, etc. On the other hand the faculty members consulted knowledgeable persons, and their colleagues for information seeking (Patitungklho & Deshpande, 2005). It is noteworthy that e-journals, e-databases, and other similar sources that are available in electronic format were put to the maximum use compared to print and other non-print sources. Contrastingly, the usage statistics of the library revealed that only 30% of the users visited the library daily (Guruprasad & Nikam, 2010; Singh, 2013; Satishkumar, Gautam & Vijayaraghavan, 2011).

6.3 ASSESSMENT OF TIME UTILIZATION FOR SEEKING INFORMATION BY THE RESPONDENTS

Time spent by the respondents for seeking information varies between individuals due to numerous reasons. However, the findings prompt that more time was spent by the respondents seeking information at the work place (implies all

channels of information retrieval), followed by online resources, institutional libraries, discussion with colleagues and the least recorded was personal libraries. It goes without saying that work places are host to large infrastructure facilities, manpower resources and basic amenities apart from internet connectivity. Online resources follow next as there is always the easy option of data tracking at one's own convenience anywhere as it deems fit, followed by institutional libraries, discussion with colleagues and personal libraries. The personal libraries are a rarity, simply because individuals cannot stock all information for lack of funds, space and time.

According to the convenient time to access information by the respondents, the percentages for different time slots of anytime, early morning, evening time, lunch break and late night are 37.3%, 33%, 17%, 10.3%, and 2.3% respectively. The preference for anytime is that respondents prefer soliciting information without wasting time, the probable reasons for early morning retrieval would be to avoid rush in internet traffic and institutional libraries as the day progresses. Given that the least percentage is during night time, one of the probable reasons is that most of the institutional libraries are open from 8 am to 8 pm only.

A study similar to this finding carried out by Sahu and Goswami (2008) evidently proved that the dedicated researchers spent about 16% of their time for reading and searching literature whereas the research scholars could spend their time on this activity more than the dedicated researchers.

6.4 TYPE OF INFORMATION SOURCES PREFERRED BY VETERINARY PROFESSIONALS

In any academic institution it is known that 'textbooks' take its predominant role as there were 67% of the respondents prefer to use the same, followed by newspapers (42.3%), magazines (29.8%), reference books (28.5%) and journals (26.5%) were the first choice of respondents among the formal sources of information. Among the non-print sources, television was preferred by 30.7% of respondents always, followed by CDs and DVDs with 16.8% and the least was the radio with only 7.2% of respondents who always used it. It was further observed that among the online sources, e-journals ranks first (42.5%), e-books comes as second

preference with 39.8% of respondents who always used and the e-databases was at third place with 19.3% of respondents who used this source always.

Many studies were conducted on the preference of information sources by various professionals. A few of them relevant to the present study were summarized in Chapter 2. The result of the present study coincides with other studies. Ever since, the emergence of internet during late 1990's information producers made information accessible via internet in a variety of non-print formats. There was a paradigm shift experienced in information collection, access, desirable format, mode of service delivery and so on. However, the perception of respondents among various disciplines varies from one to another significantly. As reported by Ucak and Kurbanoghu (1998), while engineers and scientists preferred more of periodicals, the scholars of humanities preferred books, and social science scholars preferred books and periodicals to some extent. In the use of electronic retrieval system, the engineers and scientists could make use of these systems effectively. On the whole, the major complaint of the respondents was that the non-availability of books in their own libraries. So, they opined that ILL service should be enhanced to benefit all the respondents. Zhang and Chignell (2001) argued that though the academic community prefers online journals and magazines, the internet sources can only be supplement to print sources but not as replacement, since the respondents prefer more of formal sources (Kumar, 2010; Singh & Satija, 2007; Yitzhaki & Hammershlag, 2004; Zawawi & Majid, 2001; Trivedi & Joshi, 2009) due to their innate merits such as convenience, easy handling, reliability, and durability. Therefore, it is clear that we cannot do away with the print sources which will have their own stand ever with the consumers.

6.5 THE EXTENT OF DEPENDENCE OF PROFESSIONALS ON VARIOUS SOURCES OF INFORMATION

Ready access to information anytime is a boon to all the academicians with the internet services. So, it comes as no doubt that 60.2% of respondents are always found to use free internet sources for open access journals. This is a revelation as we realize that on comparison, the percentage of respondents is 14.6% personally subscribing to printed journals always. This would mean that the internet is making massive inroads in source of data retrieval for its many advantages. At the same time, 36.1 % of the

respondents purchase the latest edition of books in their specific fields. While it may look apparently that the institutional libraries are paving way for e-resources, a sizable 46.9% of respondents always were using the same. This would indicate that libraries being warehouses of information, the surveyed institutes probably are well-stocked with latest editions, and maintained well.

It was found from earlier studies that no findings either coincide or contrast with the result of present study. The reason could be that the availability of free and open access resources available on the internet have eliminated the barrier of relying on one particular source for professional related information. Therefore, it may be argued that no individual source can influence the academic and research community of a particular subject.

6.6 ASSESSMENT OF THE EXTENT OF USE OF LIBRARY FACILITIES BY THE RESPONDENTS

Use of library facilities includes three components: i) Availability of library in the work place ii) Using university (or) college library iii) Discussion with library staff. By using chi-square test of significance, it was found that there was a significant difference that exists among the respondents with respect to usage of library facilities in their work place. Further, the test revealed that there was a significant difference ($p<0.05$) between faculty and Ph.D. scholars, faculty and PG students with regard to usage of their institutional library resources. However, it was observed that there was no significant difference between Ph.D. scholars and PG students for the same.

Towards this direction a few studies attempted to assess the extent of use of the library by its stakeholders. The studies revealed that libraries were used optionally by the academicians for various purposes such as; to borrow books (Fatima & Ahmad, 2008; Harinarayana, Vasantha & Swamy, 2008), to read books, newspapers, and journals (Biradar, Dharanikumar & Mahesh, 2009), to prepare for seminars, examinations, tests, assignments, etc. (Arokyamary & Ramasesh, 2009), to prepare research proposals and writing reports (Majid, Anwar & Eisenschitz, 2000), to keep up-to-date with the latest developments (Sahu & Goswami, 2008; Singh & Satija, 2007). The same scenario was observed in the present study in terms of using library resources and services by veterinary professionals in South India.

6.7 ASSESSMENT OF USAGE OF INFORMATION FOR RESEARCH AND PUBLICATIONS BY THE RESPONDENTS

To identify the difference between respondents, Chi-square test was applied. It was evident from the analysis that there was a significant difference between the groups. It was observed that there was significant difference between the faculty and PG students. Further analysis revealed that there was no significant difference between faculty and Ph.D. scholars and also no significant difference exists between Ph.D. scholars and PG students with regard to usage of information for their research and publications / productivity.

There were hardly a few studies were conducted on the impact of the use of library resources on the research publications. In view of this, an attempt was made by the researcher revealed that the use of library resources influences the research productivity of the respondents irrespective of the category viz. PG students, Ph.D scholars, and Faculty. So, it is obvious that the veterinary professionals depend on the library sources. It is evident from an earlier study (Sahu & Goswami, 2009) that the use of electronic sources enhances not only the number of research publications but also the quality of papers. The publications produced by the scientists using library sources were highly beneficial to the R&D sector.

6.8 ASSESSMENT OF USAGE LEVEL OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) BASED INFORMATION SOURCES

ICT constitutes the components such as; computer literacy, internet usage, use of e-journals and e-databases by the respondents. Computer literacy is essential for literature search, thesis reporting, data analysis and for other scientific pursuits. During this study it was observed that 99.4% respondents were competent in using MS office tools and techniques and all the respondents were thorough in the techniques of internet browsing. Internet for e-mail correspondence accounted for 99% of the respondents followed by 81.6% respondents using internet for browsing e-journals. Online databases are gaining popularity as 50.3% of respondents are using the same. To conclude, internet search engine Google was the most used search engine.

It is interesting to note that while 91% of respondents had access to e-journals and subject e-databases, 9% respondents did not have facility for the same. This may be attributed to lack of subscription to the e-journals and e-databases by concerned institutes. The fact that 91% of the respondents have access to e-resources indicates that the veterinary institutes in South India are surging ahead in information and communication technology, and that funds were not a constraint in the development of these institutes, to be global players. The most used e-databases are PubMed, Vet Science and CAB Direct and the first choice of preference was PubMed (56.2%). The less known e-databases were Animal Production, Vet Med Resources and Bio One databases, which may be attributed to poor coverage of subjects, difficulty in data retrieval and lack of latest editions etc.

The similar findings were observed in the earlier studies as stated below: Internet is widely used as source of information by academicians. Studies of Hemminger et al (2007) and Anwar and Asghar (2009) proved that majority of the respondents used internet as source of information. With regard to use of search engines, Google was found to be the most used search engine (Patitungklho & Despande, 2005). Sharma and Gupta (2012) reported that Google and Yahoo were frequently used search engines by the faculties. Findings of the studies on the use of e-resources like e-journals, e-books, e-databases etc. revealed that these resources were used by the engineers (Mahapatra, 2006), and physicians / surgeons (Ashraf, 2012; Perryman, 2014). Particularly, the 'PubMed' database was found to be widely used (Wessel & Tannery, 2006; Hersh et al 2002(a); Tang, 2007).

6.9 CONCLUDING REMARKS

From the above discussion, it is clear that the study conducted by the researcher is a milestone. The researcher has employed suitable methods to conduct research without any hindrances and has brought out unexpected facts and figures. It is evident that the findings of each variable tested in the present study had similar findings with a considerable number of earlier studies reviewed and presented in Chapter 2. However, there was a significant difference observed in the present scenario compared to the past in terms information need, search pattern, preference of information sources, and so on. In view of the above fact, it is strongly felt that the study is worth and can be expanded at national level for the benefit of society at large.

CHAPTER 7

FINDINGS, SUGGESTIONS AND CONCLUSION

7.0 INTRODUCTION

It is a customary procedure of any research to provide at the end the summary of findings of the study, suggestions for improvement and cite areas for further research. This chapter is devoted to the same purpose. The findings are summarized based on the objectives and hypotheses with appropriate headings.

7.1 FINDINGS

The study led to the following major findings based on the analysis of data:

Socio - Economic information of the respondents

- Out of total respondents (678), 431 were male respondents (63.6%) and 247 were female respondents (36.4%).
- Out of total respondents (678), majority was from the state of Andhra Pradesh (224) followed by Tamil Nadu (172), Kerala (119), Karnataka (108) and Puducherry (55). The reason for maximum number of respondents in the state of Andhra Pradesh could be the number of veterinary colleges is more than any the other states.
- Majority of respondents (213) belong to the age group of 20 – 25 years followed by the age group of 26 – 30 years (173). It reveals that more than half of the respondents (56.9%) are below 30 years of age. It shows that more and more number of younger generations is choosing the 'Veterinary science' as their career.
- With regard to educational qualifications, there are 288 respondents (42.5%) with UG degree (B.V.Sc.& A.H.), followed by 228 respondents (33.6%) with PG degree (M.V.Sc.). More than 3/4 of the respondents are either with UG or PG degree.
- More than 1/3 of the respondents (38.6 %) do not have any experience. It may be due to that these respondents are either PG students or Ph.D. scholars.

- Out of total respondents (678), only 30% of the respondents (204) are having more than five years of experience and above.
- Almost ¾ (73.3%) of the respondents are working in the constituent colleges of veterinary universities.
- Only 26.4% (179) of the respondents are working in the veterinary universities.
- Only 17.3% of the respondents are fully engaged in teaching. 38.9% of the respondents do not have any experience in teaching.
- Only 20.6% of the respondents are fully engaged in research. 28% of the respondents do not have any experience in research.
- Only 0.4% of the respondents are fully engaged in extension activities. 63% of the respondents do not have any experience in extension activities.
- Almost all the respondents (91.3%) are not engaged in private practice. Only 8.7% of the respondents are engaged in private practice. Since all the respondents are working in the academic institutions as well as half of them are getting non-practicing allowance (NPA) along with their salary, do not engage in private practice.
- Among the respondents who engaged in private practice, 50.85% of them (30 respondents) doing 3 to 4 hours practice per day.
- Among the respondents who engaged in private practice, 55.93% of them (33 respondents) attending less than five cases per day.
- Out of total respondents (678), 40% of them (270) have enrolled themselves in two professional associations.
- 34.1% (231) of the respondents have enrolled in one professional association, i.e. either state level or national level.
- 130 (19.2%) respondents do not have membership in any professional association.

General information Needs / Purposes of the respondents

The preference of general and clinical information needs of the respondents is given below in descending order:

- Among the general information needs information for ‘updating subject knowledge’ was needed always by most of the respondents (60%), followed

by information for ‘research & publications’ required by 292 (43%) respondents.

- 280 (41.3%) respondents always required information for ‘taking classes’ and 255 (37.6%) respondents always required information for ‘higher education’
- There are 162 (23.9%) respondents always required information for ‘educating owners / farmers’ and 158 (23.3%) respondents always required information for ‘preparation for guest lectures / seminars / conferences’.
- Among the various needs the least preferred need for which the respondents always require information was for ‘preparation for guest lectures / seminars / conferences’.
- 41 (6%) respondents never wanted information for ‘taking classes’ and 34 (5%) respondents never wanted information for ‘educating the owners / farmers’.

Clinical information needs of the respondents

- Among the clinical information needs 364 (53.7%) respondents always require information for ‘diagnosis’ and 354 (52.2%) respondents always require information for ‘treatment’.
- 323 (47.6%) respondents always require information for ‘clinical signs’ and 310 (45.7%) respondents always require information for ‘differential diagnosis’.
- Out of total respondents, 292 (43.1%) respondents always require information for ‘prevention’ and 280 (41.3%) respondents always require information for ‘causes’.
- 249 (36.7%) respondents always require information for ‘emergency medicine’ and 234 (34.5%) respondents always require information for ‘follow-up treatment’ and there are only 226 (33.3%) respondents always require information for ‘pathogenesis’.
- 120 (17.7%) professionals never wanted information for ‘emergency medicine’
- 116 (17.1%) professionals never wanted information for ‘follow-up treatment’
- 102 (15%) professionals never wanted information for ‘prevention’
- 100 (14.7%) professionals never wanted information for ‘pathogenesis’

- 99 (14.6%) professionals never wanted information for ‘treatment’
- 97 (14.3%) professionals never wanted information for ‘differential diagnosis’
- 94 (13.9%) professionals never wanted information for ‘diagnosis’ and ‘causes’
- 93 (13.7%) professionals never wanted information for ‘clinical signs’

Use of formal sources of information by the respondents

Formal sources of information are most preferred and very much useful source in providing required information to the respondents. The various formal sources of information preferred by the respondents are given below:

- Out of 678 total respondents, 454 (67%) respondents always used ‘textbooks’ for their requirements followed by ‘News papers’ which was always used by 287 (42.3%) respondents.
- Magazines comes third preferred formal source of information, which was always used by 202 (29.8%) respondents, fourth preferred source is ‘reference books’ which was always used by 193 (28.5%) respondents.
- Journals is next preferred source, which was always used by 180 (26.5%) respondents, 112 (16.5%) respondents always used CIMS / MIMS / VET INDEX / CIM VET – which is a ready recknor for veterinary professionals.
- There are 64 (9.4%) respondents who always used ‘drug information sheets’ and 60 (8.8%) respondents always used ‘news letters’ and 54 (8.0%) respondents always used ‘information bulletins’ and 53 (7.8%) respondents always used ‘conference proceedings’.
- It is important to mention here that there are 37 (5.5%) and 34 (5%) respondents never used ‘news papers’ and ‘magazines’ respectively.
- There are 32 (4.7%) respondents never used ‘conference proceedings’ and 8 (1.2%) respondents never used ‘journals’.
- Among various formal sources of information, ‘text books’ were found to be the most preferred source with 96.9% of the respondents either always or frequently used this source, followed by ‘journals’ with 81.1% of the respondents either always or frequently used this source of information.
- It is also important to note here that all the respondents used ‘text books’ and ‘reference books’ either always or frequently or rarely.

- It is inferred that even though the online sources plays a predominant role in providing information but at the same time the formal sources particularly text books, reference books, journals etc... are occupying an important and indispensable source in providing information.

Use of non-print sources of information by the respondents

The findings of usage of non-print sources of information by the respondents are given below:

- Among the non-print sources the 'television' occupied an important place among the respondents with 208 (30.7%) of the total respondents who always used television and 230 (33.9%) respondents frequently used this source for their professional activities.
- CDs and DVDs are next to television, which was always used by 114 (16.8%) respondents and frequently used by 282 (41.6%) respondents.
- Radio is the least preferred non-print source among the respondents. Only 49 (7.2%) respondents always used it and maximum number of respondents 141 (20.8%) never used this source for their professional needs.

Use of online sources of information by the respondents

In this electronic age of communication the role of online sources of information is gaining more importance day by day. It was therefore found that:

- Out of 678 total respondents, 288 (42.5%) and 303 (44.7%) respondents always and frequently used 'e–journals' respectively.
- e–books was always used by 270 (39.8%) respondents and frequently used by 303 (44.7%) respondents.
- Veterinary science e-databases was always used by 131 (19.3%) respondents and frequently used by 274 (40.4%) respondents.
- Social networking sites like Facebook, Twitter, WhatsApp etc... were always used by 361 (53.2%) respondents and frequently used by 244 (36.0%) respondents.
- Open access source was also equally utilized by the respondents like other online sources with 235 (34.7%) respondents always used it and 268 (39.5%) respondents frequently used it.

- Discussion forum was not preferred by the respondents. Only 64 (9.4%) respondents used it always, 180 (26.5%) used it frequently, 344 (50.7%) used it rarely and 90 (13.3%) never used it.

Use of informal sources of information by the respondents

- Among the informal sources of information 'discussion with colleagues' was mostly used by the respondents. 317 (46.8%) of them used it always and 316 (46.6%) frequently used it.
- Discussion with subject experts was second preferred source with 199 (29.4%) respondents always used it and 366 (54%) frequently used it.
- Attending seminars / conferences / workshops was always preferred by 91 (13.4%) respondents and frequently used by 347 (51.2%) respondents.
- Discussion with clients / farmers is another important informal source which was used by 102 (15%) respondents always and 242 (35.7%) respondents frequently and 60 (8.8%) respondents never had any discussion with clients / farmers.
- There are only 51 (7.5%) respondents always and 200 (29.5%) frequently contacted the librarians / library staff for their information needs and 78 (11.5%) respondents never contacted the librarians.
- There are 31 (4.6%) always and 121 (17.8%) frequently discussed with medical representatives for getting information about the new drugs and its effects. However, this is the least preferred source with 147 (21.7%) respondents never tried it and 379 (55.9%) respondents used it rarely.

Preferred discussion procedure with colleagues by the respondents

Discussion with colleagues is the one of the best informal sources of information for any professional. The following findings reveal how the veterinary professionals got the best out of it:

- Out of five ways to have discussion with colleagues, the respondents preferred more to have discussion directly (face-to-face) with their colleagues. 428 (63.1%) respondents always and 225 (33.2%) respondents frequently had discussion with their colleagues.

- 224 (33%) respondents always and 359 (52.9%) respondents frequently used cell phone / phone to discuss with colleagues.
- E-mail was another preferred medium to have discussion with colleagues with 164 (24.2%) respondents always and 350 (51.6%) respondents frequently used this source.
- Through SMS / Chatting, there are 129 (19%) respondents always and 261 (38.5%) respondents frequently used this source.
- The last and least preferred source was 'by letter'. There are only 11 (1.6%) respondents always and 72 (10.6%) respondents frequently discussed with their colleagues by letter. There are 264 (38.9%) respondents rarely used and 331 (48.8%) respondents never tried this source.

Time spent by the respondents for seeking information

- Out of total respondents 678, there are 77 (11.4%) respondents who spent more than 22 hours and 76 (11.2%) respondents spent more than 15 hours to 21 hours per week in their work place for seeking information.
- Next to their work place, online sources provide enormous, latest and up to date information to veterinary professionals, where 36 (5.3%) respondents spent more than 22 hours and 75 (11.1%) respondents spent more than 15 hours to 21 hours per week for seeking information.
- There are 13 (1.9%) respondents and 26 (3.8%) respondents spent more than 22 hours and 15 hours to 21 hours respectively in institutional libraries for gathering information.
- For discussion with colleagues and subject experts there are 15 (2.2%) respondents and 21 (3.1%) respondents who spent more than 22 hours and 15 hours to 21 hours respectively to seek information on weekly basis.
- There are only 9 (1.3%) respondents spent more than 22 hours and 24 (3.5%) respondents spent 15 to 21 hours in their personal libraries for collecting information.

Convenient time to access information by the respondents

- Most of the respondents were willing to access information at any time from any sources of information (formal sources, non-print sources, online sources and informal sources). There were 253 (37.3%) respondents willing to access

formal sources of information at any time (no specific time), 224 (33%) desire to get information in the early morning, 115 (17%) opted to get information at evening time, 70 (10.3%) willing to access during lunch break and 16 (2.3%) prefer at late night.

- Out of total respondents, 282 (41.6%) respondents were willing to access non-print sources of information at any time, 191 (28.2%) preferred at evening time, 73 (10.8%) preferred during lunch break, 70 (10.3%) during late night, 53 (7.8%) in the early morning and 9 (1.3%) never used non-print source of information.
- Use of online sources among veterinary professionals was found to be increasing day by day. There were 287 (42.3%) professionals willing to access information through online at any time, 163 (24.0%) preferred evening time, 115 (17%) preferred at late night, 70 (10.3%) during early hours, 43 (6.3%) during lunch break.
- 398 (58.7%) respondents were willing to get information through informal sources at any time, 118 (17.4%) during evening time, 73 (10.8%) at lunch break, 42 (6.2%) at late night, 36 (5.3%) in the early morning and 11 (1.6%) respondents never used informal sources for seeking information.

Different sources / modes of obtaining information by the respondents

- Out of total respondents, 99 (14.6%) respondents and 234 (34.5%) respondents personally subscribed printed journals always and frequently respectively.
- 65 (9.6%) respondents always and 223 (32.9%) respondents frequently subscribed personally the online journals.
- 245 (36.1%) respondents frequently purchased the latest edition of books on their respective fields.
- There are 318 (46.9%) respondents who always used institutional (university / college) library for seeking information.
- 119 (17.6%) always and 239 (35.3%) frequently used the publications of their associations.
- Majority of the respondents (60.2%) always used free internet sources (open access sources) and 33.6% of respondents frequently used this source.

- There are 241 (35.5%) respondents always and 254 (37.5%) respondents frequently used free subject e-databases.
- Out of 678 total respondents, there are 254 (37.5%) respondents always and 335 (49.4%) respondents frequently discussed with their colleagues for getting information.
- 143 (21.1%) respondents always and 344 (50.7%) frequently discussed with subject specialists for seeking information.
- The least preferred source is getting information from 'product information sheets' given by medical representatives. Only 41 (6.0%) respondents always and 152 (22.4%) respondents frequently referred to the new product information sheets to know additionally about the new veterinary products, new drugs, new vaccines etc.

Constraints / Barriers to obtain information by the respondents

The respondents opined that they face several problems while seeking information.

- Out of 678 total respondents, Almost 50% (337) respondents informed that 'lack of time' is a constraint for them.
- Only 79 (11.7%) respondents felt that 'lack of awareness' is constraint for them.
- 'Distance between workplace and residence' was a constraint for 245 (36.1%) respondents.
- There are 231 (34.1%) respondents stated that 'information overload' is a problem for them.
- High cost of printed reading materials (books and journals) and e-resources (e-journals and other online sources) are problem for 560 (82.6%) respondents and 367 (54.1%) respondents respectively.
- 153 (22.6%) respondents felt that lack of sufficient library facilities in their work place is a constraint for them.
- There are 282 (41.6%) respondents opined that shortage of personal library collection of reading materials is a problem for them.
- Lack of computer / internet facility is a problem for 156 (23%) respondents.
- Lack of computer skills / training is a problem for 105 (15.5%) respondents.

- There are 164 (24.2%) respondents informed that lack of librarians / information providers is a constraint for them.

Computer skills, usage of internet, e-resources by the respondents

- 99.4% (674) respondents were competent in using MS office tools and techniques.
- All respondents (678) thoroughly knew the procedures / techniques of internet browsing.
- 94% (637) respondents used social networking sites (facebook, twitter etc...)
- 114 respondents browse internet at their home, 140 respondents used at their office and 424 respondents were able access internet facility both at home and office.
- Internet was mainly used for e-mail communications by 671 (99%) respondents followed by 553 (81.6%) respondents used internet for browsing e-journals.
- 341 (50.3%) respondents used internet for browsing online subject databases.
- 53.7% (364) respondents used internet for chatting and other recreational purposes.
- More than half of the respondents (52.1%) used internet for reading newspapers and magazines.
- Google and Yahoo were the most used search engines.

Use of e-journals and e-databases by the respondents

- Out of 678 total respondents, 617 (91%) respondents had access to e-journals and subject e-databases but 61 (9%) respondents did not have facility to access e-journals and e-databases.
- More or less 40% of the respondents accessed e-journals at office only while 37.9% of the respondents accessed e-journals both at office and home, and 13.4% of respondents used e-journals at their homes only.
- The most used e-databases are PubMed, Vet Science and CAB Direct.
- Out of total 678 respondents, 381 (56.2%) respondents preferred the ‘PubMed’ database as their first choice.

- Next to ‘PubMed’ there are 170 (25.1%) respondents who preferred ‘CAB Direct’ as their second choice.
- ‘Vet Science’ database was rated second by 143 (21.1%) respondents.
- More than 50% (349) of the respondents never used the ‘Animal Production’ database.
- There are 335 (49.4%) respondents never used the ‘Vet Med Resources’ database.
- 443 (65.3%) respondents never used the ‘Bio-One’ database.

FINDINGS RELATING TO HYPOTHESES

Hypotheses were framed based on the objectives of the study and the same were tested using Chi-square test and one way ANOVA (Analysis of Variance). The findings are as follows:

Hypothesis – 1.1: “There is no difference among the veterinary professionals working in various states with respect to their general information needs.”

Based on the Chi-square test, it was observed that there was no significant difference among the veterinary professionals of various states with respect to their general information needs such as; for taking classes, and for research and publications. This may be attributed to the uniform syllabus that is followed throughout the country; and in case of research and publications only truth will prevail in any scientific reporting and hence one cannot expect differences to arise in these parameters. However, significant difference was observed for updating subject knowledge and clinical knowledge, in preparation of guest lectures / conferences, for higher education and for educating the cattle owners / farmers. With regard to these parameters, the differences may emanate owing to the kind of information that is required, the standard that should be met to cater to the stakeholders, the approach or the path to be adopted to impart the skills. Conferences are the places where one has a learned audience but the same kind of update cannot be transferred to cattle owners simply because they are workers at grass root level with traditional knowledge and with minimal education or no formal education. Out of seven variables, the

significant difference existed among five variables and therefore the null hypothesis was rejected and for the rest two, the null hypothesis was accepted.

Hypothesis – 1.2: "There is no difference among the veterinary professionals working in various states with respect to their clinical information needs."

Based on the Chi-square test, it was observed that there were no significant difference among the veterinary professionals of different states with respect to differential diagnosis, prevention and emergency medicine. The null hypothesis was therefore accepted. This lack of significant difference may be due to no sudden and new emerging diseases. The diseases are well understood by all clinicians so as not to warrant any difference in information retrieval. The same holds true for emergency treatment. However, there was significant difference for causes for diseases, clinical signs, pathogenesis, diagnosis, treatment and for follow-up treatment. The null hypothesis was rejected for these parameters. Though no new and sudden diseases may be argued for the earlier yet differences exist for five parameters. This may be attributed to diseases which strike locally, diseases that are endemic to particular geographical areas, seasonal afflictions etc.

Hypothesis – 2: **"**There is no difference among veterinary professionals working in various states with respect to the average duration of time utilized in search of information."

Based on the one way ANOVA result, there was significant difference among the respondents in spending time to get relevant information from their work place, university library, and online resources. The null hypothesis was rejected. The difference may be attributed to presence of high end computers, subscription to paid journals (both print and online), high speed internet connectivity, unscheduled power cuts, open hours of libraries on weekends, a large collection of reference materials, access to facilities that include photocopying and scanning, among others. There was no significant difference with regard to time spent at personal library and in discussion with colleagues. The null hypothesis was accepted. This may be attributed

to space availability of individuals and the camaraderie prevalent among the faculty for easy discussion.

Hypothesis – 3.1: "There is no difference among the veterinary professionals working in various states with respect to their use of formal sources of information."

Based on the Chi-square test, it was observed that there was no significant difference with regard to text books, journals, vet index, newspapers / magazines, conference proceedings and newsletters, among the users. Hence, the null hypothesis was accepted. Given the data sample and the nature of information source, it is obvious that both the information seeker and the sources sought are ideally paired. There is a transfer of knowledge in this formal source of information. It was observed that significant difference existed for reference books, information bulletins and drug information sheets. Here, we reject the null hypothesis. Information bulletins and drug information sheets are prepared keeping in view, a larger audience and a wider reach. The language is simple, and the technical details conveyed being very minimalistic. While these may be sought by students of Veterinary Extension, Livestock Production System, they may not find many takers in students of other disciplines.

Hypothesis – 3.2: "There is no difference among the veterinary professionals working in various states with respect to their dependence on non-print sources."

Based on the Chi-square test, there was no significant difference in the use of the CDs/DVDs, television telecast in different languages. Hence, we accept the null hypothesis. Multimedia sources and hard disks give similar information on any topic and hence no significant difference is observed. In the context of radio, there was significant difference in the number of broadcasting stations with more respondents able to hear different programs. Hence, the null hypothesis is rejected. This may be due to the fact that while some may prefer radio as a means of information retrieval, others may not find it a necessity in the first place. And for those interested, the

choice of program is the determining factor based on the kind of information desired. Hence, differences are bound to arise in this section.

Hypothesis – 3.3: "There is no difference among the veterinary professionals working in various states with respect to their dependence on online sources of information."

Based on the Chi-square test, it was observed that there was no significant difference among the respondents for subject databases, internet sources, open access sources and discussion forum. Hence, we accept the null hypothesis. All the above mentioned fall under a category of a rich repertoire of knowledge, or rather a wealth of information that can only be understood by those who are specific in their details required. The details provided by them are fine, intricate and deep; rather the ultimate in subject search. Hence, no significant difference observed. However, there was significant difference for e-journals and e-books. Hence, we reject the null hypothesis. Access to e-journals and e-books are dependent on their purchase and storage by libraries / individuals. The cost of the same are exorbitant and hence many libraries / individuals may not purchase the same, and if purchased may be few in number and this may give rise to significant differences.

Hypothesis – 3.4: "There is no difference among the veterinary professionals working in various states with respect to their dependence on informal sources of information."

Based on the Chi-square test, it was observed that there was no significant difference among the respondents for discussion with colleagues and subject experts. Here, we accept the null hypothesis. Colleagues and subject experts are core human resources, engaged in solving the mysteries of science; and can be accessed causally or by appointment. Their sharing of experience, knowledge and skills cut across all barriers in the pursuit of science. Hence, no significant difference observed. However, there was significant difference for attending seminars, discussion with library staff, medical representatives, clients and farmers differ. Here, we reject the null hypothesis. The category sought includes a wide berth that ranges from informal to

formal; from grass root workers to lab workers; from literate individuals to minimal / illiterates. Hence, significant differences observed.

Hypothesis – 4: "There is no difference among the veterinary professionals working in various states with respect to their usage of library facilities."

Using chi-square test of significance, it was observed that there was significant difference among the respondents with respect to all the three parameters studied (Usage of university or college library, Discussion with librarian / library staff and Availability of library in the workplace). This difference may be attributed to the difference in infrastructure facilities, amenities available, high speed internet connectivity, working hours of the libraries, courteous and friendly staff, photocopying and scanning facilities, a comfortable ambience, proper storage and retrieval of books and journals. Hence, the alternate hypothesis is accepted.

Hypothesis – 5: "There is no difference among the academic position of the veterinary professionals with respect to their research productivity."

To identify the difference between them, Chi-square test was applied. It is evident from the analysis that there was a significant difference between the groups. Hence, the hypothesis H_0 is rejected. Faculties are always under pressure to publish to move up in their careers and PhD scholars need to publish their findings for acceptance of thesis. Such a condition is not prevalent for the Post-graduate students. Therefore, significant differences are observed.

7.2 SUGGESTIONS

The productivity of an organization depends on the activities performed within the organization in a co-ordinated manner. The veterinary institutions undertaken for the study are not exceptional. Through this study, it was observed that there is a little gap in terms of infrastructure, working pattern, quality publications, etc. To overcome these barriers, the study suggests the following:

- Adequate infrastructure facilities should be provided to the professionals, particularly the library should be equipped with latest reading materials and all facilities including hi-speed internet with Wi-Fi facility.
- Those professionals who are working in the remote areas (farms / research centres) should be provided with remote user login ID facility to access the library materials without any discrimination.
- Required number of manpower with sufficient regular annual budget should be provided to the library in order keep the resources up to date and provide new and improved services.
- It was informed by the respondents (PG students) that library hours should be given within working hours or extended library hours. This suggestion is quite reasonable and should be viewed seriously. Therefore, the library hours should be part of the regular class time table or working hours of the library should be extended beyond class hours to make best use of library resources and services.
- Periodic orientation or user education programme need to be conducted to make the users aware of new arrivals.
- The librarians should take initiatives to get the users well versed with information retrieval system in order to make them retrieve required information precisely without wasting much of time and energy.
- There is a need to come up with a national plan, wherein the institutions located in rural areas could integrate with bigger institutions in urban areas at national level, and thereby get the opportunities to learn from the experts in their field.
- Efforts should be made to encourage the professionals working in veterinary institutions of South India to publish in relatively higher impact factor journals.

7.3 CONCLUSION

The study throws light on various aspects related to information need and seeking behavior of veterinary professionals from 14 veterinary institutions in South India. The investigation has brought out a few fruitful facts and figures. It was found that the resources and services rendered in the institutions under study are optimally utilized. The use of electronic resources including the Internet and search engines was

found to be quite encouraging. However, the information seeking pattern of the veterinary professionals was not up to the expectations. The reasons identified were preference of online sources rather than print; the research stations/farms (constituent colleges) located far away from the Head Quarters do not have adequate access to online resources due to lack of infrastructure; lack of skills in formulating search query for retrieving the required information precisely; and so on. These facts brought by the present study are worth considering through which the infrastructure of the institutions and the research productivity of the professionals can be certainly enhanced. Enhancing interaction facility with the peer experts will lead to qualitative research. Therefore, there should be a dedicated forum for veterinary professionals to discuss and deliberate professional related issues.

7.4 AREAS FOR FURTHER RESEARCH

The study was carried out among the faculty members, PhD scholars and PG students from veterinary academic institutions in South India. The undergraduate students were not included. This study can be extended to UG students also since number of respondents are more in this category. This study does not include the veterinarians who are working in the fields / villages and have direct contact with farmers and owners of the cattle. Their information needs, problems and expectations are to be analyzed. A study can be conducted to find out the possibilities to have a separate consortium only for veterinary science under which the academic institutions, research institutions and the field veterinarians can be linked so as to exchange information by all the veterinarians. The study may be conducted in other related domains of veterinary science *viz*. Fisheries science, Wild Life science, and Dairy science. While carrying out the research, the opinion of focused group in the relevant area may be considered for better results.

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INFORMATION SEEKING BEHAVIOUR OF VETERINARY PROFESSIONALS IN SOUTH INDIA

QUESTIONNAIRE

SECTION 1: PERSONAL INFORMATION

1.1 Name (Optional)	:	
1.2 Age	:	
1.3 Gender	:	Male / Female
1.4 Educational Qualification (Please tick the relevant ones)	:	Post. Doc./ Ph.D.,/ M.V.Sc., in ---------- B.V.Sc. & A.H., Plus any other degree / diploma ---------- (Please specify)
1.5 Designation:	:	Prof. & Head/ Prof./ Assoc.Prof./Asst. Prof./ Ph.D., Scholar/ PG Student/ Teaching Asst./ Research Associate/ JRF/SRF
1.6 Experience in years	:	
1.7 Workplace	:	University/ College/ Research Station/ Farm/ KVK/ UTRC/ FTC
1.8 Primary activities	:	Teaching(%) Research(%) Extension(%)
1.9 Private practicing	:	Yes / No
1.9.1 If yes, No. of hours per day	:	
1.9.2 No. of cases seen / day	:	

1.10 Membership in Professional Bodies :

State …….. National: …… International: …….

SECTION 2: INFORMATION NEED / PURPOSE

2.1 What are the needs / purposes of information seeking?
(Please tick in the appropriate box)

S.No.	Information needed	Always	Frequently	Rarely	Never
1	For taking classes				
2	For updating subject knowledge				
3	For updating clinical knowledge				
4	Preparation for Guest lecture / seminars / conferences				
5	For higher education				
6	For research and publications				
7	For educating the owners / farmers				

Others, please specify ----------

2.2 What are the clinical information you need? (Please tick in the appropriate box)

S.No	Needed clinical information	Always	Frequently	Rarely	Never
1	Causes				
2	Clinical Signs				
3	Pathogenesis				
4	Diagnosis				
5	Differential diagnosis				
6	Treatment				
7	Prevention				
8	Follow-up				
9	Emergency medicine				

Others, please specify _____

SECTION 3: USE OF INFORMATION SOURCES / SERVICES

3.1 Please indicate how often you make use of the following information sources.
(Please tick in the appropriate box)

a) Formal Sources

S.No.	Formal Sources	Always	Frequently	Rarely	Never
1	Text books				
2	Reference books (Encyclopedia, Directories, Thesaurus etc…)				
3	Journals				
4	Conference proceedings				
5	CIMS /MIMS/ VET INDEX/ CIMVET				
6	Newsletters				
7	Information bulletins				
8	Drug information sheets				
9	News papers				
10	Magazines				

b) Non-Print Sources

S.No.	Non -book sources	Always	frequently	Rarely	Never
1	Television				
2	Radio				
3	CDs and DVDs				

c) Online Sources

S.No.	Online Sources	Always	Frequently	Rarely	Never
1	E- journals				
2	E-books				
3	Subject databases				
4	Internet sources (Portals, Social networking sites etc…)				
5	Open Access Sources				
6	Discussion forum				

d) Informal Sources

S.No.	Informal Sources	Always	Frequently	Rarely	Never
1	Discussion with colleagues				
2	Discussion with subject experts				
3	Attending Seminars / Conferences and Workshops				
4	Discussion with the university / college librarians / library staff				
5	Discussion with the medical representatives				
6	Discussion with the farmers / clients				

3.2 How do you discuss with colleagues?

S.No.	Discussing Procedures	Always	Frequently	Rarely	Never
1	Face-to-face / personal contact				
2	By letter				
3	Over phone/ cell phone				
4	Email				
5.	SMS / Chatting				

3.3 How much time do you spend for information seeking/week?

S.No	Place	Hours / week
1	Work place	
2	Personal library	
3	University / College libraries	
4	Discussion with colleagues and professionals	
5	Online resources	

3.4 Which time is more convenient to access information?

Time / Sources	Early morning	During lunch break	Evening time	Late night	No specific time / As and when required	Not used
Formal sources						
Non-print sources						
Online sources						
Informal sources						

3.5 How do you obtain information sources?

S.No.	Sources	Always	Frequently	Rarely	Never
1.	Personal subscription to printed Journals				
2.	Personal subscription to online journals				
3.	Purchase of the latest books				
4.	Making use of the university / college library				
5.	Professional membership in associations				
6.	Access through free internet sources				
7.	Access through free subject data bases				
8.	Discussion with Colleagues				
9.	Discussion with Specialists				
10.	Attending workshops / conferences / symposia				
11.	Product information sheets from the medical representatives				

3.6 What are the constrains faced while seeking information?

S.No.	Problems	Yes	No
1	Lack of time		
2	Lack of interest		
3	Distance between workplace and residence		
4	Information overload		
5	High cost of books and journals		
6	High cost of electronic, digital and internet sources		
7	Lack of library in the workplace		
8	Lack of personal library		
9	Lack of computer / internet facility		
10	Lack of computer training / knowledge		
11	Lack of librarians / information providers		

SECTION 4:
USE OF COMPUTER, INTERNET, E-JOURNALS AND ONLINE LIFE SCIENCES DATABASES

4.1 Do you know the following computer applications?

a) MS word ……Yes ……..No
b) Internet Browsing ……Yes ……..No
c) Email access ……Yes ……..No
d) Social networking ……Yes ……..No

4.2 Do you have Internet facility? ----------Yes ----------No
If Yes, available at -------- home, ---------- office, ----------both

4.3 For what purpose do you use the Internet? (Please tick the relevant ones)
E-mail / online medical databases/ e-Journals/ chatting / recreation / reading newspapers / reading magazines

4.4 Rank the search engines frequently used?

Google	Yahoo	MSN	AltaVista	Lycos

4.5 What purpose do you have an E-mail ID for?
To discuss with colleagues / to join a forum / for easy communication / for recreation / to get subject information
Others, please Specify.……

4.6 Do you have access to electronic journals on your subject? … Yes / …… No

4.7 Do you search online databases? …… Yes / …….. No

4.7.1 If Yes, where ….. at home ….. in office ….. both

4.7.2 If Yes, please rank the following subject databases according to your usage

Pub med	CAB Direct	Vet. Science database	Animal Production database	Vet Med Resource	Bio one

Others, please specify----------

4. 7.3 If No, the major reasons for not accessing to the online journals / Databases?
Not easy to access / do not know how to search / lack of time to search / no trained assistance / not needed
Others, please specify ----------

INFORMATION SEEKING BEHAVIOUR OF
VETERINARY PROFESSIONALS IN SOUTH INDIA

PUNCH CODE

SECTION 1: PERSONAL INFORMATION

Field No.	Question No.	Description	Field Name
1		Respondent Number	**ResNo**
2		State	**State** Tamil Nadu - **TN,** Kerala – **KL** Andhra Pradesh **–** **AP** Karnataka – **KA,** Puducherry - **PY**
3		Place	**Place** Chennai – **CHE,** Namakkal – **NAM** Orathanadu – **ORA,** Thirunelveli **– THI,** Mannuthy – **MAN,** Pookode – **POO,** Tirupati – **TIR,** Hyderabad – **HYD,** Gannavaram **– GAN,** Kadappa – **KAD,** Karim Nagar – **KAR,** Hebbal – **HEB,** Hassan - **HAS**
4	1.2	Age	**Age**
5	1.3	Gender	**Sex** Male **1** Female **2**
6	1.4	Educational Qualification	**Edu** Post. Doc. - **1,** Ph.D., - **2,** M.V.Sc., - **3,** B.V.Sc. & A.H., - **4**
7	1.5	Designation	**Desig** Prof. & Head – **1,** Prof. – **2,** Assoc.Prof. – **3,** Asst. Prof - **4,** Ph.D., Scholar – **5,** PG Student **– 6,** Teaching Asst./ Research Associate – **7**
8	1.6	Experience	**Exp**
9	1.7	Work Place	**WP** University – **1,** College – **2,** Research Station/ Farm/ KVK/ UTRC/ FTC - **3**
	1.8	Primary Activities	10 - Teaching – **Teach** 11 - Research – **Reseh** 12 - Extension - **Extn**
	Teaching, Research, Extension		
	1.9	Private Practice	13 - **PPracYN** Yes **1,** No **0** 14 - **Hours** 15 - **Cases**
	1.10	Membership in Professional Bodies	16 - **Memb** State only **1,** National only **2,** International only **3,** State and National **4,** State and International **5,** National and International **6,** All three **7,** No Membership **0**

SECTION 2: INFORMATION NEED / PURPOSE

Always 1	**Frequently 2**	**Rarely 3**	**Never 4**

2.1 What are the needs / purposes of information seeking?

Field No.	Question No.	Information needed	Field Name
17	2.1.1	For taking classes	**TakCla**
18	2.1.2	For updating subject knowledge	**SubKno**
19	2.1.3	For updating clinical knowledge	**CliKno**
20	2.1.4	Preparation for Guest lecture / seminars / conferences	**LecSem**
21	2.1.5	For higher education	**HigEdu**
22	2.1.6	For research and publications	**ResPub**
23	2.1.7	For educating the owners / farmers	**EduFar**

2.2 What are the clinical information you need?

Field No.	Question No.	Needed clinical information	Field Name
24	2.2.1	Causes	**Cause**
25	2.2.2	Clinical Signs	**CliSig**
26	2.2.3	Pathogenesis	**Patho**
27	2.2.4	Diagnosis	**Diago**
28	2.2.5	Differential diagnosis	**DifDia**
29	2.2.6	Treatment	**Treat**
30	2.2.7	Prevention	**Preven**
31	2.2.8	Follow-up	**Follow**
32	2.2.9	Emergency medicine	**EmMed**

SECTION 3: USE OF INFORMATION SOURCES / SERVICES

Always 1	**Frequently 2**	**Rarely 3**	**Never 4**

3.1 Use of following Information Sources

a) Formal Sources

Field No.	Question No.	Formal Sources	Field Name
33	3.1a1	Text books	**TBook**
34	3.1a2	Reference books (Encyclopedia, Directories, Thesaurus etc…)	**RefBook**
35	3.1a3	Journals	**Journ**
36	3.1a4	Conference proceedings	**ConPro**
37	3.1a5	CIMS /MIMS/ VET INDEX/ CIMVET	**CIMS**
38	3.1a6	Newsletters	**NLett**
39	3.1a7	Information bulletins	**InfBull**
40	3.1a8	Drug information sheets	**DruInf**
41	3.1a9	News papers	**NPaperA**
42	3.1a10	Magazines	**Magaz**

b) Non-Print Sources

Field No.	Question No.	Non -book sources	Field Name
43	3.1b1	Television	**TV**
44	3.1b2	Radio	**Radio**
45	3.1b3	CDs and DVDs	**DVD**

c) Online Sources

Field No.	Question No.	Online Sources	Field Name
46	3.1c1	E-Journals	**EJournA**
47	3.1c2	E-books	**EBook**
48	3.1c3	Subject databases	**SubData**
49	3.1c4	Internet sources (Portals, Social networking sites etc…)	**IntSo**
50	3.1c5	Open Access Sources	**OpenSo**
51	3.1c6	Discussion forum	**DisFor**

d) Informal Sources

Field No.	Question No.	Informal Sources	Field Name
52	3.1d1	Discussion with colleagues	**DisCollA**
53	3.1d2	Discussion with subject experts	**DisExp**
54	3.1d3	Attending Seminars / Conferences and Workshops	**ConfA**
55	3.1d4	Discussion with the university / college librarians / library staff	**DisLib**
56	3.1d5	Discussion with the medical Representatives	**DisRepA**
57	3.1d6	Discussion with the farmers / Clients	**DisFar**

3.2 How do you discuss with colleagues?

Field No.	Question No.	Discussing Procedures	Field Name
58	3.2.1	Face-to-face / personal contact	**Face**
59	3.2.2	By letter	**Letter**
60	3.2.3	Over phone/ cell phone	**Phone**
61	3.2.4	Email	**EMailA**
62	3.2.5	SMS / Chatting	**SMS**

3.3 How much time do you spend for information seeking/week?

Field No.	Question No.	Place	Field Name
63	3.3.1	Work place	**WPlaceA**
64	3.3.2	Personal library	**PerLibA**
65	3.3.3	University / College libraries	**UnivLib**
66	3.3.4	Discussion with colleagues and professionals	**DisCollB**
67	3.3.5	Online resources	**OnlineA**

3.4 Which time is more convenient to access information?

Field No	Field Name	Time / Source	Early Morning 1	During Lunch Break 2	Evening Time 3	Late Night 4	No specific Time / As and when required 5	Not used 6
68	**ForSo**	**3.4.1** Formal sources						
69	**NPSo**	**3.4.2** Non-print sources						
70	**OnlineB**	**3.4.3** Online sources						
71	**InfoSo**	**3.4.4** Informal sources						

3.5 How do you obtain information sources?

Field No.	Question No.	Sources	Field Name
72	3.5.1	Personal subscription to printed Journals	**SubPJls**
73	3.5.2	Personal subscription to online journals	**SubOnJls**
74	3.5.3	Purchase of the latest books	**Books**
75	3.5.4	Making use of the university / college library	**ULib**
76	3.5.5	Professional membership in associations	**Member**
77	3.5.6	Access through free internet sources	**OpIntSo**
78	3.5.7	Access through free subject data bases	**OpData**
79	3.5.8	Discussion with Colleagues	**DisCollC**
80	3.5.9	Discussion with Specialists	**DisSpl**
81	3.5.10	Attending workshops / conferences / symposia	**ConfB**
82	3.5.11	Product information sheets from the medical representatives	**DisRepB**

3.6 What are the constrains faced while seeking information?

Field No.	Question No.	Problems	Field Name	
83	3.6.1	Lack of time	**Time**	**YES 1 NO 0**
84	3.6.2	Lack of interest	**Interest**	**YES 1 NO 0**
85	3.6.3	Distance between workplace and residence	**Distance**	**YES 1 NO 0**
86	3.6.4	Information overload	**Overload**	**YES 1 NO 0**
87	3.6.5	High cost of books and journals	**Costbook**	**YES 1 NO 0**
88	3.6.6	High cost of electronic, digital and internet sources	**CosteRes**	**YES 1 NO 0**
89	3.6.7	Lack of library in the workplace	**WPlaceB**	**YES 1 NO 0**
90	3.6.8	Lack of personal library	**PerLibB**	**YES 1 NO 0**
91	3.6.9	Lack of computer / internet facility	**IntFaci**	**YES 1 NO 0**
92	3.6.10	Lack of computer training / knowledge	**Train**	**YES 1 NO 0**
93	3.6.11	Lack of librarians / information providers	**Libran**	**YES 1 NO 0**

SECTION 4:

USE OF COMPUTER, INTERNET, E-JOURNALS AND ONLINE LIFE SCIENCES DATABASES

4.1 Do you know the following computer applications?

Field No.	Question No.	Details	Field Name	
94	4.1a	MS word	**MSWord**	**YES 1 NO 0**
95	4.1b	Internet Browsing	**Internet**	**YES 1 NO 0**
96	4.1c	Email access	**EMailB**	**YES 1 NO 0**
97	4.1d	Social networking	**SoNetW**	**YES 1 NO 0**

4.2 Do you have Internet facility?

Field No.	Question No.	Details	Field Name	
98	4.2	Do you have Internet facility	**NetYN**	**YES 1 NO 0**
99	4.2	Home / Office / Both	**HOBa**	**Home 1 Office 2 Both 3**

4.3 For what purpose do you use the Internet?

Field No.	Question No.	Details	Field Name	
100	4.3	E-mail	**EmailC**	**YES 1 NO 0**
101	4.3	Online medical databases	**Database**	**YES 1 NO 0**
102	4.3	E-journals	**EjournB**	**YES 1 NO 0**
103	4.3	Chatting & recreation	**RecreaA**	**YES 1 NO 0**
104	4.3	Reading newspapers & reading magazines	**NpaperB**	**YES 1 NO 0**

4.4 Rank the search engines frequently used?

Field No.	Question No.	Details	Field Name
105	4.4	Search Engines	**SeaEng**
		Google, Yahoo, MSN, Alta Vista, Lycos	**1 Google only** **2 Yahoo only** **3 MSN only** **4 Google & Yahoo** **5 Google, Yahoo & MSN** **6 Others**

4.5 What purpose do you have an E-mail ID for?

Field No.	Question No.	Details	Field Name	
106	4.5	To discuss with colleagues	**DisCollD**	**YES 1 NO 0**
107	4.5	To join a forum	**Forum**	**YES 1 NO 0**
108	4.5	For easy communication	**Comn**	**YES 1 NO 0**
109	4.5	For recreation	**RecreaB**	**YES 1 NO 0**
110	4.5	To get subject information	**SubInf**	**YES 1 NO 0**

4.6 Do you have access to electronic journals / databases on your subject?

Field No.	Question No.	Details	Field Name	
111	4.2	Do you have access to electronic journals on your subject	**EjoulYN**	**YES 1 NO 0**
112	4.2	Home / Office / Both	**HOBb**	**Home 1 Office 2 Both 3**
113 114 115 116 117 118		PubMed CAB Direct Vet. Science database Animal Prodn. database Vet Med Resource Bio one	**1 PubMed** **2 CAB** **3 VetSc** **4 AniPro** **5 VetMed** **6 BioOne**	

No data provided by Respondents - 9

LIST OF PUBLICATIONS

Papers Published

1. **Srinivasan, V.** and Sevukan, R. (2014). A comparative study of usage of e-resources among post graduate students of medical and its allied disciplines in Puducherry. *International Journal of Information Science and Services, 8* (2), 44-50.
2. Sevukan, R. Rammiya, G. and **Srinivasan, V.** (2014). Exploring factors for the non-use of library resources by medical professionals in selected medical libraries in Puducherry. *International Journal of Library and Information Science, 3* (2), 66-75.

Papers Presented in Conferences

1. Kumaravel, C. and **Srinivasan, V.** (2012). Use and user awareness of e-resources among post graduate students: A survey. Paper presented in ***International conference on Electronic publications*** at the Department of Library & Information Science, Pondicherry University during 1-2, March 2012.
2. Sankaranarayanan, D. Ramesh, D. and **Srinivasan, V.** (2011). A study on use of search engines and search techniques by the Agricultural professionals in Tamil Nadu. Paper presented in ***National seminar on Redefining the role of libraries in the digital era*** at the Department of Library & Information Science, Annamalai University during 11-12, March 2011.