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Information Seeking Behaviour of Pharmacy Faculty: Implications for Enhancing the Quality of Pharmacy Libraries in Tamil Nadu (India)

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ABSTRACT
Information seeking behaviour is an activity of an individual in the process of identifying information that suits his/her knowledge pursuit. It is observed from the review of literature that there is no single study on the information seeking behaviour of faculties of pharmacy either at state level or national levels in India. Therefore this research has been conducted to bridge the gap on information seeking behaviour of pharmacy faculty in Tamil Nadu in view of the recent developments in information seeking behaviour, with objectives such as: to identify the information needs and seeking behaviour of faculty of the pharmacy educational institutions in Tamil Nadu (India); to examine the motivating factors for information seeking behaviour of the pharmacy faculty; to examine faculty opinions about the comprehensiveness or otherwise of respective institutions' library collections; and to analyse the extent of use and dependence on various sources of information for teaching and research. A total of 729 questionnaires have been distributed among 41 pharmacy educational institutions in Tamil Nadu, out of which 601 have responded, and the response rate is 82.44%. Based on the findings of the study certain implications have been derived as measures to enhance the quality of the pharmacy libraries in Tamil Nadu.

Keywords: Information Seeking Behaviour, Pharmacy Libraries, Pharmacy Faculty, Tamil Nadu (India), Survey

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1. INTRODUCTION

Information need is one of the cognitive needs of humankind. Information need causes information seeking behaviours and these concepts complement one another. The information need and information seeking behaviours are affected by many factors. The concept of information need has proved to be an elusive one and difficult to define. What initiates seeking need has received more attention from researchers than the definition of information itself. The topic, unfortunately, is also approached from such a variety of perspectives that no single definition for the conceptual construct exists. In general, the literature fails into two broad categories: Some studies attempt to determine the nature of the need, while others attempt to distinguish between levels of perception. Information need is often a vague concept. It is a more a question asked of an information provider. It is a subjective, a relative concept, existing in the minds of experienced individuals. It changes over a period of time and varies from person to person, profession to profession, and from institution to institution and so on.

2. INFORMATION SEEKING BEHAVIOR

Information seeking behaviour is an activity of an individual in the process of identifying information that suits his/her knowledge pursuit. Information seeking behaviour is used synonymously with information gathering habits or information seeking patterns. It is an act of searching, finding, or locating information required by different people such as an individual, a professional, an academician, a researcher, a consultant, and so on. The process of searching information through various channels of communication is termed as information seeking behaviour. Information seeking behavior may be defined as those activities a person may engage in when identifying his/her own needs for information, searching for such information in any way, and using or transferring that information (Wilson, 2000).

The concept of "information behavior" was coined in the late 1990s, but it traces its roots to the concept of "information needs and uses" that arose in the 1960s. There has been a gradual shift in the focus of information behavior research from a system orientation to a user orientation. At the end of the 1970's and in the beginning of the 1980's researchers began to realize that questions in information needs, seeking, and use could not be seen only from the system point of view. The user of the information and his/her needs came into focus and research in cognitive science was applied in the studies. Kumar (1990) has emphasized that information seeking behavior is mainly concerned with who needs what kind of information and for what reasons; how information is found, evaluated and used, and how needs can be identified and satisfied.

3. PHARMACY EDUCATION INSTITUTIONS IN TAMIL NADU

Pharmacy education in India traditionally has been industry and product oriented. In contrast to the situation in developed nations, graduate pharmacists prefer placements in the pharmaceutical industry. In India, formal pharmacy education leading to a degree began with the introduction of a three-year bachelor of pharmacy (B. Pharm.) at Banaras Hindu University in 1937. At that time, the curriculum was presented as a combination of pharmaceutical chemistry, analytical chemistry, and pharmacy, which prepared graduates to work as specialists in quality control and standardization of drugs for pharmaceutical companies, but not for pharmacy practice. After independence in 1947, India inherited a system for the pharmacy profession from the British rulers that was unorganized, and there was no legal restriction on the practice of pharmacy. The concept of pharmacy practice was not realized until after independence. In 1948, the Pharmacy Act was enacted as the nation's first minimum standard of educational qualification for pharmacy practice in order to regulate the practice, education, and profession of pharmacy. Currently, one needs at least a diploma in pharmacy to practice as a pharmacist. Provisions of the Act are implemented through the Pharmacy Council of India (PCI).

The establishment of Madras Medical College in Tamil Nadu, which is the second medical college in India, was a turning point in the growth of medical education in the state of Tamil Nadu. At present there are 41 pharmacy educational institutions in Tamil

Nadu affiliated to the Tamil Nadu Dr. M.G.R. Medical University (see Appendix). The first medical university for medicine was started in Andhra Pradesh and the second one in Tamil Nadu is named as The Tamil Nadu Dr. M.G.R. Medical University. An overview of pharmacy educational institutions and their libraries in Tamil Nadu has been discussed in a separate paper by the authors (Selvamani & Babu, 2014).

4. LITERATURE REVIEW

Due to the vast amounts of literature available on the subject of information seeking behavior, only recent and significant studies have been reviewed in this section.

Tahamtan et al. (2015) investigated drug information-seeking behaviour of health care professionals and the way they manage this information in a developing country that lacks necessary information technology infrastructures. The purpose of their paper is to list the resources that Iranian health care professionals used to access drug-related information, to know the features and types of drug information resources which were much more important for health care professionals, the problems they encountered in seeking drug information, and the way they organized and re-found the information that they had retrieved. Lack of access to drug information and lack of enough time were the main obstacles in seeking drug information. On the other hand, Andualem, Kebede, and Kumie (2013) assessed information needs among Ethiopian health professionals. The majority of the respondents acknowledged the need for health information in their routine activities. Important barriers to access information were geographical, organizational, personal, economic, educational status, and time. Age, sex, income, computer literacy and access, patient size, work experience, and working site were significantly associated with information needs and seeking behaviour.

In another study, DeRosa (2013) surveyed 49 physicians, 43 nursing staff members, 25 administrative staff members, 23 paramedical staff members, and 5 technical staff members, totaling 145 health professionals in Greece. The study revealed that funding for hospital libraries in Greece is an issue preventing many new initiatives, that there is no association to represent hospital libraries in Greece, that the few libraries operating in hospitals in Greece are understaffed with no administrative control, and that the majority of Greek hospitals do not have adequate library facilities. These drawbacks contribute to the information-seeking challenges experienced by Greek health care professionals.

Maharana, Dhal, and Pati (2013) investigate information seeking behavior and satisfaction level of the faculty members and students at the VSS Medical College, Burala, Odisha. The study examines frequency of library visit, purpose of information seeking, preferred resources, most preferred search engine, satisfaction level among the respondents, and so on.

Sedghi, Sanderson, and Clough (2012) reported the results of a study investigating the relevance criteria used by health care professionals when seeking medical images. The results show that participants made use of 15 relevance criteria, although they agreed on topicality being the most important. The findings suggest that users apply different criteria in different situations when evaluating the relevancy of medical images. Thus their study helps to contribute to the understanding of medical image resources and the information needs of health care professionals. A clear understanding of the medical image information needs of health care professionals is also vital to the design process and development of medical image retrieval systems.

Soundararajan and Babu (2011) analysed the information use patterns of health professionals in Christian medical colleges and hospitals in Tamil Nadu. Their study covers user information needs, search, access patterns, use of e-resources in the field of medicine and allied health fields, barriers while accessing, and e-resources.

Tenopir et al. (2009) studied the reading patterns of science, social science, technology, and medical university faculty members. Their study showed that the information seeking and reading patterns of science faculty members changed with the growth of electronic journals.

Hider (2009) analysed the information seeking behaviour of clinical staff with a random sample of 850 hospital clinical staff belonging to 3 professional groupings: medical and dental, nursing, and allied health professionals. The results from this survey indicate that hospital clinical staff in a large health care organization have clear preferences for particular resources,

searching methods, and continuing education formats. All three groups of hospital clinical staff show a clear preference for Google among electronic resources. This survey provides a unique snapshot of the skills, attitudes, and behavior of hospital clinical staff, including allied health professionals, in a large regional health organization. Potential limitations include the relatively few medical staff responders and the proportionately lower response from nursing staff. The findings suggest that a large number of staff use and highly value Internet-based resources for clinical information seeking. Jeyshankar, Rao, and Babu (2009) examined the information needs and information seeking behaviour of dentists in Chennai. They emphasized that the existing infrastructure in terms of collection, services, and other facilities in the libraries of dental educational institutions are to be strengthened. As evident in this study, the libraries are yet to emerge as an effective information handling institution in the light of changes in the IT environment.

It is observed from the review of literature that there is no single study on the information seeking behaviour of faculties of pharmacy either at state level or national levels in India. Therefore this research has been conducted to bridge the gap on information seeking behaviours of pharmacy faculty in Tamil Nadu in view of the recent developments in information seeking behaviour.

5. OBJECTIVES OF THE STUDY

- To identify the information needs and seeking behaviour of faculty of the pharmacy educational institutions in Tamil Nadu (India).
- To examine the motivating factors for information seeking behaviour of the pharmacy faculty.
- To examine the faculty opinions about the comprehensiveness or otherwise of respective institutions' library collections.
- To analyse the extent of use and dependence on various sources of information for teaching and research.

6. METHODOLOGY

This study is based on the survey method. The data set has been collected through a questionnaire method. For this study the faculty in 41 pharmacy colleges in Tamil Nadu have been considered. A total of 729 questionnaires have been distributed among 41 pharmacy educational institutions as shown in the Appendix, out of which 601 have responded, and the response rate is 82.44%.

7. DATA ANALYSIS AND DISCUSSION

The data collected from the questionnaire have been analyzed and interpreted to test the hypotheses framed and to fulfill the stated objectives. For this purpose Statistical Package for the Social Sciences (SPSS) software has been used. The statistical analysis techniques such as frequency distribution, percentage analysis, ANOVA, Cluster Analysis, Wilcoxon Signed – Rank test, and Chi-square test, have been employed depending on the nature of the data collected from the respondents.

7.1. Background Information of the Respondents

The data in Table 1 present the classification of respondents by designation and gender. Out of 448 respondents of Assistant Professor rank, nearly half of the respondents are Male 228, and Females are 220 in number. This is followed by 48 Associate Professors of which 33 are Male and Females number 15. Out of 105 respondents of Professor ranks, 70 are Male and Females are 35 in number.

7.2. Nature and Types of Information Required: Cluster Analysis

A total of 13 types of information sources were identified as the nature and types of information required by the respondents, and the responses were analysed using cluster analysis. In the dendrogram Figure 1, at 60% distance level four interpretable clusters have been formed.

The first cluster consists of eight variables as shown in Table 2.

In Cluster 1 the agree and disagree ratio for these variables is 60.54:1, which means these sources are strongly required by the respondents. Hence this cluster has been named "Strongly Required Information Sources."

Table 1. Designation vs. Gender of the Pharmacy Faculty

S.No	Gender	Designation			Total n = 601
		Assistant Professors n = 448	Associate Professors n = 48	Professors n = 105	
1	Male	228 (37.94)	33 (5.49)	70 (11.65)	331 (55.08)
2	Female	220 (36.60)	15 (2.50)	35 (5.82)	270 (44.92)
	Total	448 (74.54)	48 (7.99)	105 (17.47)	601 (100.0)

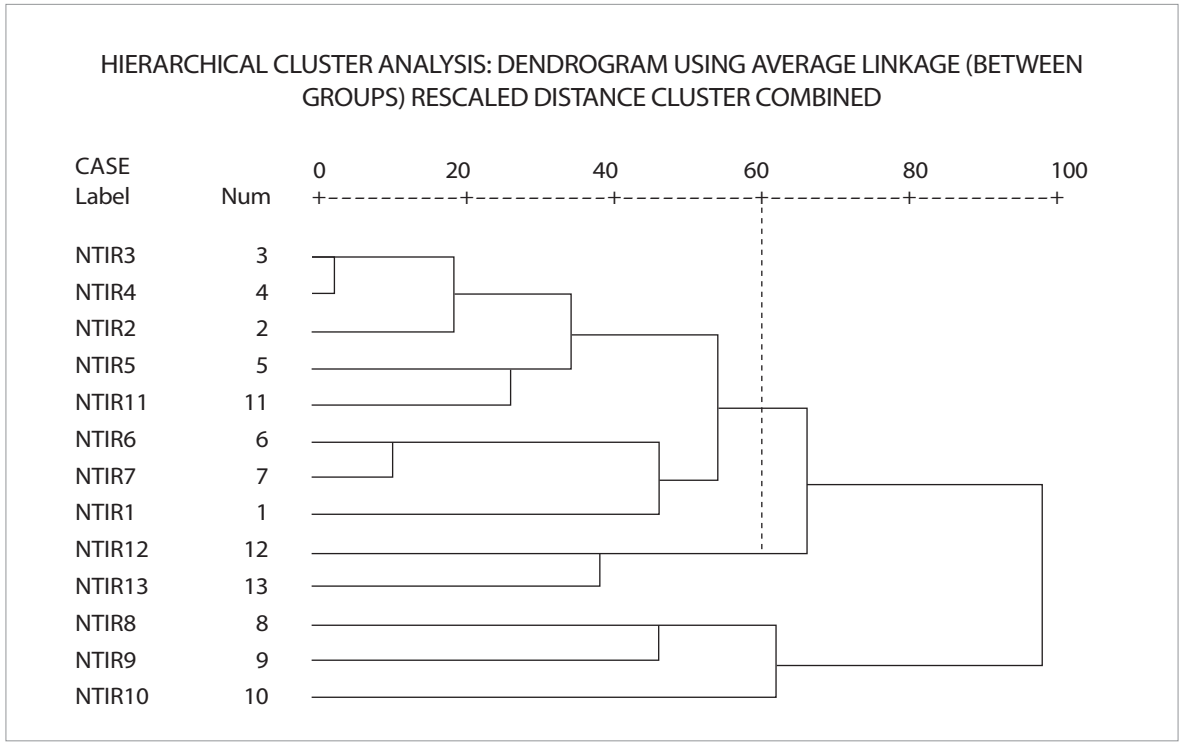

Fig. 1 Mobile device ownership over time

The second cluster has been formed with two variables as shown in Table 3.

In Cluster 2 the agree and disagree ratio is 40:1, which reveals that these variables are highly required by the pharmacy faculty. Therefore this cluster has been named "Highly Required Information Sources."

The third cluster has been formed with two variables as shown in Table 4.

In Cluster 3 the agree and disagree ratio is 27:1, which reveals that these variables are moderately required by the pharmacy faculty. Therefore this cluster has been named "Rarely required Information Sources."

The fourth cluster has been formed with only one variable as shown in Table 5.

In this cluster the agree and disagree ratio is 32:1, which means these sources are moderately required by the respondents. Therefore this cluster has been named "Moderately required Information sources."

Table 2. Cluster 1: Strongly Required Information Sources

S.No	Variable Code	Description	Agree	Disagree
1	NTI3	Methods, process and procedures	593	8
2	NTI4	Experimental designs, results, and information application	592	9
3	NTI2	Background theory	588	13
4	NTI5	Product, material	588	13
5	NTI11	Information about lab procedures	585	16
6	NTI6	Information about previous work done in your field	595	6
7	NTI7	Information about current developments in your field	595	6
8	NTI1	Review of literature	593	8
		Total	4729	79

Table 3. Cluster 2: Highly Required Information Sources

S.No	Variable Code	Description	Agree	Disagree
1	NTI12	Scientific and technical news	586	15
2	NTI13	Information about government decisions on medical field	587	14
		Total	1173	29

Table 4. Cluster 3: Rarely Required Information Sources

S.No	Variable Code	Description	Agree	Disagree
1	NTI8	Computer programs and model building information	582	19
2	NTI9	Standards and patent specifications and codes of practice	576	25
		Total	1158	44

Table 5. Cluster 4: Moderately Required Information Sources

S.No	Variable Code	Description	Agree	Disagree
1	NTI10	Statistical data	580	21
		Total	580	21

7.3. Purpose of Information Seeking Behaviour ANOVA Test for Purposes of Information Seeking vs. Designation

ANOVA test has been conducted for the purposes of information seeking with the designation of the sample and the data set is presented in Table 6

The Calculated F value is higher than the table value, for the following two variables:

1. To increase promotional opportunities (3.987)
2. To prepare notes for special lectures / public speeches, etc. (3.931)

Hence, it is inferred that there is no significant difference between the variables in the ANOVA test for the rest of the variables, since the F value is lower than the table value.

Table 6. Purposes of Information Seeking vs. Designation

S.No	Purposes of Information Seeking	Calculated F Value	Rank
1	To prepare for class teaching	1.458	5
2	To guide my students project/research scholars	1.234	6
3	General awareness for new knowledge	.221	18
4	For participation in seminars/conferences, etc.	1.172	7
5	To increase promotional opportunities	3.987	1
6	To conduct seminars/summer/winter school programmes, etc.	.082	19
7	To write and publish papers	1.058	12
8	To prepare notes for special lectures/public speeches, etc.	3.931	2
9	To set question papers, etc.	1.112	11
10	For set up and use of equipment	.364	16
11	To check authenticity of available results/ information	1.113	10
12	To check and evaluate one's own results	.891	14
13	To broaden the area of attention and work done in related areas	.369	15
14	To crystallize broad and vague assertions	1.932	4
15	To evolve innovative ideas	1.171	8
16	To know about gov't decisions on medical field	.246	17
17	To have visibility among peers and colleagues	.930	13
18	Sharing with the members of the team	.075	21
19	Broad ending area of attention and reviewing work done in the related areas	.080	20
20	Keeping abreast of latest development in the field	1.170	9
21	Orienting your work with the existing body of knowledge	2.288	3

Degrees of freedom 2; table value at 0.05 level of significance 2.9957

7.4. Dependence on Formal and Documentary Sources Chi Square Test on the Dependence on Formal and Documentary Sources

The data in Table 7 reveal that for three variables Chi-square value is greater than the table value, which are as follows:

1. Official documents in medical departments (31.2)
2. Trade catalogues (24.8)
3. Reference books (24.4)

It is inferred that there is a significant relationship between the dependence on the above formal and documentary sources, and the designation of the sample. Out of thirteen types of formal and documentary sources, three variables have higher Chi-Square value when analysed in relation to the designation of the respondents.

7.5. Dependence on Informal and Interpersonal Sources ANOVA Test for Dependence on Informal and Interpersonal Sources vs. Designation

The respondent's dependence on informal and interpersonal sources has also been analysed by ANOVA Test and the results are presented in Table 8.

It is observed from Table 8 that the F value is higher than the table value for only two variables, namely "Result of own experience" and "Consulting expert in the field," which infers that the difference in sample mean is significant.

7.6. Use of Library Special Services

Opinions on eleven different of special services were obtained and the same is shown in Table 9.

Among the services provided in the library, "Journal Circulation" is showing a positive opinion (322) 53.58%, followed by "Literature Searching" with (307) 51.08% respondents, and third rank goes to "e-Resources" with (279) 46.42% of respondents (Table 9).

The first three ranks are as follows.

Rank 1. The accuracy of information, 347 (57.74%)

Rank 2. The understandability of information, 251 (41.76%)

Rank 3. Its up-to-date-ness of information, 229 (38.10%)

Table 7. Dependence on Formal and Documentary Sources vs. Designation

S.No	Formal and Documentary Sources	Chi-Square
1	Books	4.7
2	Reference books	24.4
3	Conference proceedings	6.9
4	Thesis and dissertations	4.3
5	Current reading materials	11.4
6	Technical/ R&D reports	7.6
7	Standards and patent specifications	22.6
8	Official documents in medical departments	31.2
9	Reprints and preprints from fellow professionals	12.5
10	Abstracting the indexing sources	7.1
11	Trade catalogues	24.8
12	Personal collections	14.4
13	Audio/video recordings	8.2

Degrees of freedom 2; table value at 0.05 level of significance 2.9957

Table 8. ANOVA Test for Dependence on Informal and Interpersonal Sources vs. Institution

S.No	Informal and Interpersonal sources	F Value
1	Personal experiences	2.579
2	Consulting experts in the field	4.030
3	Consulting colleagues and fellow professionals	1.187
4	Results of one's own experience	5.308
5	Consulting library staff/catalogues/OPACs	2.945
6	Professional meetings, seminars, symposia, and lectures	.784
7	Educational and training courses	1.264
8	Fellow professionals outside	1.070
9	Visit to pharmacy industries	.871

Degrees of freedom 2; table value at 0.05 level of significance 2.9957

Table 9. Special Services Provided in the Library vs. Designation

S.No	Services	Designation			Total n = 601	Rank
		Asst Professor n=448	Associate Professor n=48	Professor n=105		
1	Translation	36 (5.99)	2 (0.33)	8 (1.33)	46 (7.65)	11
2	Journal circulation	235 (39.10)	28 (4.66)	59 (9.82)	322 (53.58)	1
3	Literature searching	223 (37.11)	27 (4.49)	57 (9.48)	307 (51.08)	2
4	Compilation of bibliographies	73 (12.15)	6 (1)	22 (3.66)	101 (16.81)	9
5	Indexing and abstracting services	127 (21.13)	10 (1.66)	41 (6.82)	178 (29.61)	6
6	Library bulletin	94 (15.64)	19 (3.16)	25 (4.16)	138 (22.96)	7
7	Photocopying	165 (27.45)	18 (3)	46 (7.65)	229 (38.10)	4
8	Selective dissemination of information	45 (7.49)	1 (0.16)	9 (1.5)	55 (9.15)	10
9	NIC-NET services	91 (15.14)	6 (1)	22 (3.66)	119 (19.80)	8
10	CD-ROM services	131 (21.79)	14 (2.33)	48 (7.99)	193 (32.11)	5
11	e-Resources	203 (33.77)	20 (3.33)	56 (9.32)	279 (46.42)	3

7.7. Time Spent in the Institution's Library

In this study the respondents were asked to furnish the time spent in their respective institution's library, and the data are presented in Table 11.

It is observed from Table 11 that 27.62% of the sample spent between 16 and 20 hours in a week in the library, followed by 21.95% with between 11 and 15 hours. A meager percentage (6.16%) spent less than 4 hours per week. Therefore it is inferred that the larger the number of respondents, the greater the number of hours spent in the library.

7.8. Delegation of Work for Information Seeking

Nearly 1/3 of respondents are in the habit of collecting information by searching individually and 41.60% delegate occasionally. It is interesting to note that the highest number of respondents delegate occasionally (41.60%) and a meager percentage (12.81%) delegate frequently. The reason may be attributed to the phenomena that the institution's environment and professors are busy with teaching and research (Table 12).

Table 10. Factors in the Context of Information Services vs. Designation

S.No	Information services	1	2	3	4	5	Rank
1	The cost in money	101 (16.81)	93 (15.47)	244 (40.60)	62 (10.32)	101 (16.80)	6
2	The time it took	37 (6.16)	84 (13.98)	152 (25.29)	195 (32.45)	133 (22.12)	4
3	Its up to-date-ness	26 (4.33)	53 (8.82)	146 (24.29)	147 (24.46)	229 (38.10)	3
4	The accuracy of information	1 (0.16)	42 (6.99)	85 (14.14)	126 (20.97)	347 (57.74)	1
5	The understandability of information	7 (1.16)	31 (5.16)	153 (25.46)	159 (26.46)	251 (41.76)	2
6	The accessibility of the information	97 (16.14)	44 (7.32)	115 (19.14)	163 (27.12)	182 (30.28)	5

1 – Not important 2 – Least important 3 - Important 4 - Very Important 5 - Most Important

Table 11. Classification of Faculty by Time Spent in the Institution's Library per Week

S.No	Time spent in the library Per week	Designation			Total n = 601	Rank
		Asst. Professor n=448	Associate Professor n=48	Professor n=105		
1	More than 20 hrs	65 (10.81)	6 (1)	8 (1.33)	79 (13.14)	5
2	Between 16 and 20 hrs	117 (19.47)	17 (2.83)	32 (5.32)	166 (27.62)	1
3	Between 11 and 15 hrs	87 (14.47)	16 (2.66)	29 (4.82)	132 (21.95)	2
4	Between 7 and 10 hrs	84 (13.97)	4 (0.66)	15 (2.49)	103 (17.12)	3
5	Between 4 and 6 hrs	66 (10.98)	4 (0.66)	14 (2.33)	84 (13.97)	4
6	Less than 4 hrs per week	29 (4.83)	1 (0.17)	7 (1.16)	37 (6.16)	6

7.9. Motivational Factors for Information Seeking Behaviour

The first 5 ranks are as follows:

1. To pursue research related to work in the field, 51.75%
2. For self-improvement, 46.92%
3. To achieve desired result in work, 45.59%
4. To acquire and update knowledge in the field, 41.76%
5. For pleasure of doing work, self-fulfillment, and self-satisfaction, 41.26%

It is observed from Table 14 that 1/3 of respondents

Table 12. Delegation of Work vs. Designation

S.No	Delegation of work	Designation			Total n = 601
		Asst. Professor n=448	Associate Professor n=448	Professor n=448	
1	No Delegation	94 (15.64)	14 (2.33)	24 (3.99)	132 (21.96)
2	Delegate Occasionally	186 (30.95)	21 (3.49)	43 (7.15)	250 (41.60)
3	Delegate Moderately	109 (18.14)	9 (1.5)	24 (3.99)	142 (23.63)
4	Delegate Frequently	59 (9.82)	4 (0.66)	14 (2.33)	77 (12.81)

Table 13. Motivational Factors for Information Seeking Behaviour

S.No	Motivational factors	1	2	3	4	5	Rank
1	To pursue research related to work in the field	24 (3.99)	37 (6.16)	127 (21.13)	311 (51.75)	102 (16.97)	1
2	To have visibility among peers and colleagues	30 (4.99)	84 (13.98)	180 (29.95)	92 (15.31)	215 (35.77)	8
3	To have an edge over other competitors	50 (8.32)	81 (13.48)	198 (32.94)	110 (18.30)	162 (26.96)	11
4	For recognition	34 (5.66)	69 (11.48)	179 (29.78)	158 (26.29)	161 (26.79)	12
5	To prepare for project review	19 (3.16)	41 (6.82)	144 (23.96)	208 (34.61)	189 (31.45)	10
6	For self-improvement	13 (2.16)	46 (7.65)	125 (20.80)	282 (46.92)	135 (22.46)	2
7	To acquire and update knowledge in the field	9 (1.50)	41 (6.82)	164 (27.29)	251 (41.76)	136 (22.63)	4
8	To maintain professional competence	13 (2.16)	29 (4.83)	141 (23.46)	239 (39.77)	179 (29.78)	6
9	To achieve desired result in work	22 (3.66)	24 (3.99)	133 (22.13)	274 (45.59)	148 (24.63)	3
10	To write and publish	10 (1.66)	49 (8.15)	167 (27.79)	209 (34.78)	166 (27.62)	9
11	To pursue continuing education	20 (3.33)	45 (7.49)	168 (27.95)	216 (35.94)	152 (25.29)	7
12	For pleasure of doing work, self-fulfillment, and self-satisfaction	36 (6)	41 (6.82)	165 (27.45)	248 (41.26)	111 (18.47)	5

n = 601

1 - Non motivator 2 - Weakest motivator 3 - Average motivator 4 - Fairly motivator 5 - Strongest motivator

Table 14. Environment that Affects Information Seeking Behaviour vs. Designation

S.No	Environment affects of information needs	Designation			Total n = 601	Rank
		Asst. Professor n=448	Associate Professor n=48	Professor n=105		
1	Information overload	64 (10.64)	5 (0.83)	27 (4.5)	96 (15.97)	4
2	Medical council of India norms on medical education	30 (4.99)	4 (0.67)	10 (1.66)	44 (7.32)	5
3	Challenging diseases and new drugs	153 (25.46)	15 (2.49)	36 (5.99)	204 (33.94)	1
4	Changing pattern of education	125 (27.9)	9 (1.5)	29 (4.83)	163 (27.12)	2
5	New syllabus pattern of university	111 (18.46)	9 (1.5)	21 (3.49)	14 (23.46)	3

(33.94%) are of the opinion that challenging diseases and new drugs, followed by "Changing pattern of education" (27.12%), and "New syllabus pattern of university" (23.46%) and "Information overload" (15.97%), and a meager percentage of opinions having "Medical council of India norms on medical education" (7.32%), are the factors that affect information seeking behaviour.

7.10. Dependence on Institution's Library Sources for Research Wilcoxon Signed – Rank Test for the Dependence on Institution's Library Sources for Teaching and Research

The dependence on information sources available in the institution's library for teaching and research has been analysed through Wilcoxon Rank Test for each variable, and the results are shown in Table 15.

The frequency distribution, mean rank, and the two-tailed probability values of the respondent's dependence on the institution's library for teaching and research are presented in Table 15. The following inferences could be drawn:

i. The respondents differ on their dependence on the institution's library sources for teaching and research.
ii. The two-tailed values for the all variables indicates that the dependence by the respondents on these variables for teaching do differ from research, since their values are lesser than the table value of 0.05.
iii. This may be due to the fact that these sources are not much sought for in the pharmacy subjects.

8. IMPLICATIONS FOR ENHANCING THE QUALITY OF PHARMACY LIBRARIES IN TAMIL NADU (INDIA)

According to the overall findings of the study, it was obvious that there is a need for a big shift in building and improving the system for providing pharmacy information in pharmacy colleges in Tamil Nadu. Although change is likely to take time, it is clearly vital that a much-needed pharmacy information management service is supported by high-quality resources and advanced technologies. To ensure this, some recommended strategies and practical solutions are proposed for improving the quality in pharmacy libraries in Tamil Nadu.

8.1. Enhancement of ICT Facilities in Pharmacy Libraries

The majority of respondents prefer the Internet as their first source to look for needed information as they feel that it has a significant impact on their study / research / teaching. The majority of faculty members prefer pharmacy educational institutions' libraries as the most convenient place for accessing the Internet. Networking the pharmacy college libraries would positively help users in satisfying their information needs

Table 15. Dependence on the Institution's Library Sources for Teaching and Research

S.No	Sources	Role	No Dependence	Rare Dependence	Occasional Dependence	Frequent Dependence	High Dependence	Mean Rank	Tow-tailed Probability
1	Books	Teaching	2.3	1.66	7.15	30.2	58.56	123.56	0.000<0.05
		Research	3.16	3.32	15.80	29.11.	48.58	113.49	
2	Article in Journal	Teaching	3.16	7.82	23.62	33.61	31.78	157.83	0.000<0.05
		Research	0.83	2.83	5.32	18.64	72.38	148.77	
3	Newspapers	Teaching	5.99	24.29	29.95	21.13	18.64	125.86	0.000<0.05
		Research	7.99	15.97	27.12	26.46	22.46	112.03	
4	Govt. Documents	Teaching	16.97	20.30	27.79	19.63	15.31	85.70	0.000<0.05
		Research	14.64	19.30	21.46	24.63	19.97	87.48	
5	Dissertations	Teaching	10.15	17.14	27.62	24.79	20.30	105.61	0.000<0.05
		Research	15.82	10.82	23.96	29.78	29.61	106.68	
6	Field/Survey Reports	Teaching	13.81	19.80	29.62	19.47	17.30	99.85	0.000<0.05
		Research	7.15	15.81	26.62	22.13	28.29	107.77	
7	Indexing & Abstracting Services	Teaching	10.48	13.48	26.12	22.63	27.29	90.94	0.000<0.05
		Research	3.83	8.49	22.13	26.12	39.43	127.28	
8	Audio/Visual	Teaching	15.99	17.14	26.29	25.46	25.12	120.44	0.000<0.05
		Research	5.16	14.64	26.46	24.46	29.28	99.99	
9	Book Reviews	Teaching	7.15	11.81	21.13	32.12	27.79	77.86	0.000<0.05
		Research	2.83	6.99	17.47	31.28	41.43	108.54	
10	Patents and Standards	Teaching	11.48	19.97	26.79	20.80	20.96	97.79	0.000<0.05
		Research	6.49	12.81	20.30	26.96	33.44	123.11	
11	Internet Services	Teaching	4.16	6.16	14.81	29.45	45.42	88.28	0.000<0.05
		Research	3	4.49	9.98	18.80	63.73	94.58	

through other libraries. Providing Internet facilities in the library by charging nominal fees would help in generating revenue for the library.

This is a challenge as well as an opportunity to serve library users effectively. Hence it is suggested that the libraries must make all efforts to upgrade the Information Communication and Technology (ICT) infrastructure for providing seamless broadband/leased line Internet access to users. By establishing cyber libraries or computer centres within the library, the libraries can attract user communities.

8.2. Information Literacy Program

The respondents often face difficulties such as too much information in too many different formats scattered on the Internet. They often resolve these

information access problems by preferring an individual, independent work, or consulting peers. Users have also indicated that they learn about information skills for information seeking in this changing ICT environment by trial and error and through colleagues and friends. In view of this prevailing situation, it is suggested that the libraries must plan and implement new information literacy programmes which impart required skills / techniques to the users in accessing electronic information resources more effectively.

8.3. Library Staff Assistance

It is recommended that the library staff or the librarians could use their time in a better way by focusing on assisting the users. The librarians should help the users to improve their skills in information seeking activities and to find the different types of information they need. The librarians should also assist the users in learning the use of OPAC, search engine, and CD-ROM products, and web sources available through the various networks.

It is suggested that advanced training for users at different levels should be planned and implemented on a priority basis. The content of training programs should be (a) Basic introduction to library resources, services and facilities; (b) Using OPAC; (c) Methods and tools for searching information resources, (d) Using the Internet; Using online and CD-ROM databases; (f) Using electronic journals; (g) Increasing the use of reference books; and (h) Introducing audio-video materials.

8.4. In-Service Training Program for Librarians

Information technology is changing rapidly. New innovations are taking place regularly. Therefore, it is suggested that librarians should continue to monitor the latest developments in technology and the adoption of technology should be based on evidence that supports the information seeker's perspective.

It is strongly recommended that the pharmacy educational institutions in Tamil Nadu should encourage the librarians to attend regularly the training programmes organized by INFLIBNET/DELENET and other refresher courses/orientation courses, workshops, conferences, and seminars at the local and national level. There is a need to motivate medical librarians to play an important role in assessing doctors' information needs and to help them in seeking out the required information. They should be trained to participate in journal clubs and other meetings to help doctors in assessing their information needs. This can be achieved through training and assigning qualified staff in the hospital libraries and other medical libraries.

8.5. Use of Library Services

The information needs of pharmacy faculties are varied and manifold. In the light of the distinct characteristics of pharmacy faculties, the information system and services should be tailored to correlate with the characteristics of users. The study noticed that only a few services such as lending of books and periodicals and reference services are highly ranked services used and other types of services are given lower ranking. Realizing the significance of a variety of documentation services and ICT based services that influence information seeking behaviour, it is recommended that the libraries of pharmacy educational institutions should take necessary efforts to provide those services. Hence, in order to enhance awareness of the provision of such services, it is recommended that the librarians shall conduct user education programmes to propagate the availability of library services and facilities. Further, it is also feasible to periodically conduct user studies to identify the extent of non-utilization of these services. Availability, affordability, accessibility, acceptability, and sustainability of the services shall be considered while introducing ICT based services in the libraries of pharmacy educational institutions.

8.6. Faculty Motivation to Seek Information

Since it is found that the institutional affiliation and designation of the respondents have direct influence on the motivating factors for information seeking behaviour, it is urged that the managements of the pharmacy educational institutions shall create conducive environments that promote a more refined information search process. Managements should provide necessary incentives for the research output produced by the Faculty of Pharmacy.

8.7. Collection Building

In view of the requirements expressed by faculty

on various sources of information for teaching and research, it is suggested that the libraries shall acquire a variety of sources in pharmacy and allied disciplines. In case of difficulty in procuring the necessary resources due to financial constraints, it is suggested that they can enter into resource sharing arrangements with other libraries either at a local, regional, or national level. Further, in view of the changing scenario in information and communication technologies, it is suggested that the libraries attached to pharmacy institutions shall strive toward a right choice between printed and electronic media resources. There must be a good acquisition policy for libraries formulated by librarians and managements of pharmacy educational institutions. For effective utilization of information sources, the acquisition policy should be objective and need-based.

8.8. Resource Sharing and Networking

It is a mandatory on the part of pharmacy colleges in Tamil Nadu in particular, and India in general, to participate in the ERMED (Electronic Resource in Medicine) programmes as suggested by the Medical Council of India norms. In view of the increased pressure on pharmacy institutions to share resources by becoming members of the Consortium, it is suggested that all the pharmacy institutions shall become members of the Consortium, and shall also form a Consortium of Pharmacy Libraries, to harvest the progressive benefits of resource sharing and networks. It is also suggested that the following types of co-operative programmes among the pharmacy educational institutions may be initiated:

i. To promote exchange of persons with different specializations in pharmacy subjects;
ii. To identify national and international transfer centres for the exchange of information in the field of pharmacy; and
iii. To promote exchange of publications such as technical reports, field survey reports, and other research output.

8.9. Towards the Planning and Implementation of ISO 9000 Standards

Realizing the possible benefits that accrue through standardization of services and the growing tendency of the various pharmacy educational institutions opting for ISO 9000 standards, it is suggested that the pharmacy institutions, including libraries, need:

- To facilitate the development of the standardization and Total Quality Management (TQM) of Library services;
- To facilitate the international exchange of products and services and develop intellectual, scientific, technological, and economic co-operations; and
- To join the stream of ISO 9000 standards series accredited institutions.

8.10. Designing a Methodology for the Identification of Information Needs of Pharmacy Faculty

The library and information centres of the respective pharmacy educational institutions shall formulate and implement methodology for such identification of information needs as:

- Continuous refinement and updating of their information needs;
- Study of faculty and their specific environment;
- Study of the academic/research activities in the institution; and
- Conducting of formal/informal interviews with the faculty

9. CONCLUDING REMARKS

When compared to findings of earlier studies to that of the present study, it is evident that there is a clear change in the present scenario of information-seeking behaviours of academics/ scientists in the field of medicine and health sciences. A shift from library oriented information searching to Internet-based information searching is obvious. Information communication technology (ICT) has a positive impact on all the library and information services such as Reference Services, Current Awareness Services, Online Public Access Catalogues, and so on. Library users engage in a range of complementary modes of information seeking and use the electronic resources and web as an information resource to support their daily academic activities. The

information seeking behavior of users is another aspect which is influenced by developments in ICT and its application in the libraries.

The information needs of pharmacy faculty are varied and manifold. In the light of the distinct characteristics of pharmacy faculties, the information system and services should be tailored to correlate with the characteristics of users. The study noticed that only a few services such as lending of books and periodicals and reference services are highly ranked services used, and other types of services are given lower ranking. It is recommended that the libraries of pharmacy educational institutions should take necessary efforts to provide those services. It is strongly recommended that the pharmacy educational institutions in Tamil Nadu should encourage librarians to regularly attend the training programmes organized by INFLIBNET/DELENET and other refresher courses/orientation courses, workshops, conferences, and seminars at the local and national level. Pharmacy educational institutions shall create conducive environments that promote more refined information search processes. Managements should provide necessary incentives for the research output produced by the Faculty of Pharmacy. A continuous assessment of information needs and seeking behaviour of faculties and students is an essential thing to be carried out by these libraries on a regular basis. It can be expected that considering the dynamic nature of ICT and the changes in seeking behaviour, such studies would definitely bring out new findings on information needs and seeking, and will also certainly help librarians working in the pharmacy educational institutions to bring about necessary changes on a priority basis.

Introducing measures to increase the awareness of Open-Source information resources among academics is highly recommended. It is important that library professionals / information managers especially in health / medical libraries should embark on re-designing their services with innovative approaches to match with the needs of health professionals of the time. The information seeking behaviour of pharmacy faculty is significant. The pharmacy faculty had neither effective and well developed information centers such as libraries, nor Internet facilities. Conducting training on managing health information and accessing computer and improving infrastructures are important interventions to facilitate effective information seeking. Universal access to information for health professionals is needed to achieve a "health for all strategy." Hence the pharmacy educational institutions on one hand, and the librarians on the other hand, shall strive together more professionally with a blend of service-mindedness to the community, by effectively utilizing Information Technology.

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Appendix

List of Pharmacy Educational Institutions in Tamil Nadu vs. Sample Size

S.No	Name of the College/University	Year of Estd.	No. of Q Distributed	No. of Q Responded
01.	College of Pharmacy, Madras Medical College, Chennai	1988	16	13
02.	College of Pharmacy, Madurai Medical College, Madurai	1988	18	16
03.	C.L. Baid Metha College of Pharmacy, Chennai	1984	22	21
04.	J.K.K Natarajah College of Pharmacy, Namakkal	1985	19	17
05.	K.M.College of Pharmacy, Madurai	1985	20	18
06.	C.L.Baid Metha College of Pharmacy, Chennai	1986	17	14
07.	J.K.K. Natarajah College of Pharmacy, Namakkal	1987	21	18
08.	K.K.College of Pharmacy, Chennai	1992	16	10
09.	Vels College of Pharmacy,Chennai	1992	18	17
10.	Swamy Vivekanandha College of Pharmacy, Namakkal	1992	17	12
11.	J.K.K. Munirajah College of Pharmacy, Namakkal	1992	18	14
12.	The Erode College of Pharmacy, Erode	1992	15	13
13.	Nandha College of Pharmacy, Erode	1992	28	24
14.	Ultra College of Pharmacy, Madurai	1992	17	14
15.	Sankaralingam Bhuvaneswari College of Pharmacy, Virudunagar	1992	20	19
16.	Arulmigu Kalasalingam College of Pharmacy, Virudunagar	1992	19	14
17.	Maharaji College of Pharmacy, Chennai	1993	16	12
18.	Adhiparasakthi College of Pharmacy, Melmaruvathur	1993	15	10
19.	R.V.S. College of Pharmaceutical Sciences, Coimbatore	1993	18	13
20.	Fathima College of Pharmacy, Tirunelveli	1993	15	13
21.	Padmavathi College of Pharmacy, Dharmapuri	1994	25	21
22.	S.A. Raja Pharmacy College, Tirunelveli	1994	12	9
23.	S.Chattanatha Karayalar College of Pharmacy, Tirunelveli	1994	14	12
24.	Annai Velankanni Pharmacy College, Chennai	1995	11	9
25.	Kamalakshi Pandurangan College of Pharmacy, Thiruvannamalai	1995	17	15
26.	K.M.C.H.College of Pharmacy, Coimbatore	1995	18	15
27.	Cheraann's College of Pharmacy, Coimbatore	1996	19	15

S.No	Name of the College/University	Year of Estd.	No. of Q Distributed	No. of Q Responded
28.	Thanthai Roever College of Pharmacy, Tiruchirapalli	1997	16	15
29.	Mohammed Sathak A.J .College of Pharmacy, Chennai	1998	15	12
30.	P.S.G. College of Pharmacy, Coimbatore	2001	20	17
31.	Edayathangudy G.S.Pillay College of Pharmacy, Nagapattinam	2001	18	15
32.	Jaya College of Para Medical Sciences, College of Pharmacy, Chennai	2005	12	10
33.	Karpagam College of Pharmacy, Coimbatore	2006	15	12
34.	Aadhi Bhagawan College of Pharmacy, Tiruvannamalai	2007	20	14
35.	PGP College of Pharmaceutical Science & Research Institute, Namakkal	2007	16	13
36.	KRS Pallavan College of Pharmacy, Kancheepuram	2007	17	15
37.	SRM College of Pharmacy, Kancheepuram	1992	24	20
38.	Vinayaka Mission College of Pharmacy, Salem	1994	20	14
39.	JSS College of Pharmacy, Ooty	1984	18	14
40.	College of Pharmacy, Annamalai University, Chidambaram	1996	19	16
41.	Sri Ramachandra Medical College of Pharmacy, Chennai	1985	18	16
	Total		729	601