

CHAPTER 3

METHODOLOGY

3. Introduction

The present study aimed at investigating the use of ICT in Pharm ICLs' of Iran with special reference to the state-of-art of current ICT: facilities and services, ICLs' and Users' evaluation of these services, and the problems and solutions. Research design to be adopted should maximize the experimental variance or systematic variance and minimize error variance to obtain accurate and meaningful results and interpretation. Through the appropriate research design in the plan of investigation, the answers to research questions are obtainable, the research hypotheses are tested, and variance is controlled. Conducting any kind of scientific research is made feasible, sound and valid through the use of an appropriate research methodology, which is in the service of objectives of the study. The adoption of research methodology is closely connected to the objectives and hypotheses of the study, however, in case of wrongly chosen, it will lead to unsatisfactory or misleading results.

3.1. Methodology of Research

To achieve the objectives of the study a stratified random sample survey method was used. However, the questionnaire, interviews (personal and telephonic), e-mails, and observations were used as tools to collect the data. Furthermore, it was also supplemented by the other earlier studies found during the literature search to support this study. However, to support the research techniques and tools for study some of the important are: Al-Ansari (4, 2006); Ani, Esin, and Edem (6, 2005); Cochenour and Moothart (32, 2003); Dilek-kayaoglu (43, 2008); Emojorho and Adomi (49, 2006); Hardesty and Sugarman (63, 2007); Hener and Hener (67, 1967); Kumar (93, 1992); Mahdizadeh Ghalejoogh (106, 2004); Singh (176, 2000); and Uddin (206, 2003). However, to decide the correct procedure and also to answer what? why? and/or how a descriptive analytical method was used. Description, classification, measurement, comparison, and cause-effect relationships are used to describe what phenomena are (219).

3.2. Population and Sample Design

The population of the present study includes: Pharm ICLs' of Iran, and Pharm ICLs' users in Iranian Pharmacology and Allied Science colleges. There are 13 ICLs of Pharmacology and Allied Science in Iranian universities. Three of them are recently founded (during my study), which have been excluded from the study due to the lack of features, facilities needed for investigation. Consequently only ten were taken during sample survey for the study. Questionnaires were sent to these ten ICLs with the request to return the same within stimulated period. However, only nine returned duly filled in questionnaires. Out of ten only one returns the unfilled questionnaire due administrative security reasons. Consequently, the sample size is justified based on Krejcie and Morgan's Table, for the investigation (90%). Three of these Pharm ICLs are located in the capital city Tehran (Iran) and the rest are situated in different part of country in capitals of different provinces. The details: names, places, year of establishment and type of these ICLs have been illustrated in **Table-3.1**.

Table-3.1: Pharm ICLs' General Specifications

S.N.	Name of Pharm ICLs	Location (Province)	Year of Establishment	Type**
1	Tehran's FPSc*	Tehran	1956	G
2	Azad's FPSc	Tehran	1986	NG
3	Shahid Beheshti's FPSc	Tehran	1987	G
4	Shiraz's FPSc	Fars	1991	G
5	Tabriz's FPSc	Azerbaijan (East)	1958	G
6	Ahvaz's FPSc	Khuzestan	1986	G
7	Sari's FPSc	Mazandaran	1994	G
8	Kerman's FPSc	Kerman	1988	G
9	Isfahan's FPSc	Isfahan	1969	G

*FPSc=Faculty of Pharmacy and Pharmaceutical Science

**G= Governmental, NG= Non Governmental

Table-3.1 indicates that, almost all of these ICLs are Government of Iran except one of them, which belongs to private i.e. Azad's FPSc. The oldest established one is Tehran's FPSc and the most recent founded one among these

ICLs is Sari's FPSc. The detailed information on these ICLs has been described in **Chapter-4**.

However, the total population of users (members) was 4220. To determine the sample size of the users, Krejcie and Morgan's Table (**Appendix C**) was utilized. According to Krejcie and Morgan's Table for a population of about 4000, a sample of 198 is significant to yield the results and also to valid generalization of results for the whole population. However, to strengthen the results and interpretations of data, the sample size was decided to be more than the double and half times of what is indicated in Krejcie and Morgan's Table. Therefore, a total number of users' population considered for the stratified random sample survey was 450. Accordingly, questionnaires were distributed randomly among the ICLs' members in the first semester of academic year 2007-2008. The returned filled in questionnaires were 380, having response rate 84.4% (380/450) from these nine ICLs with a slightly different response rate as illustrated in **Table- 3.2**.

Table-3.2: ICL Wise Respondent Rate (Users' Questionnaire)

No.	ICL	Sent	Received	Respondent Rate (%)
1	Tehran's FPSc*	50	49	98
2	Azad's FPSc	50	49	98
3	Shahid Beheshti's FPSc	50	44	88
4	Shiraz's FPSc	50	43	86
5	Tabriz's FPSc	50	37	74
6	Ahvaz's FPSc	50	34	68
7	Sari's FPSc	50	39	78
8	Kerman's FPSc	50	35	70
9	Isfahan's FPSc	50	50	100
10	Total	450	380	84.4

According to Table-3.2, the highest respondent rate belongs to Isfahan's FPSc (100%), while the least rate is indicated for Ahvaz's FPSc (68%). Therefore, all sample centers have provided the sufficient rate for the generalization of findings.

The respondents were requested to indicate their academic level, age, experience, and sex. However, the detailed interpretation has been given in **Chapter-5**. As it is indicated in Table 3.2, the respondents were from nine Pharm ICLs of Iran. They were from Pharm D students, PhD students, Lecturers, Decision makers, Pharmacists, Pharmaceutical staff, Pharmacy Staff and General Practitioners. Pharm D students were highest in number among other group of respondents followed by PhD students. Almost equal number of females(52.1%) and males(47.9%) participated in the data collection survey. However, the age wise analysis of respondents' information summaries that the highest percentage belongs to 20-25 age group, and the least number is for > 30 age group.

3.3. Instruments of Data Collections

To collect the data there were two types of questionnaires: ICLs' Questionnaire and Users' Questionnaire. To make the study more standard, both devised questionnaires were validated through a pilot study. To carry out the pilot study various earlier studies were consulted, followed by series of discussion with experts and guide. The basic objective to carry out the pilot study was to find out the probable difficulties and shortcomings. For the pilot study, Pharm ICL of Tehran's FPsC (members) were selected. The ICLs' questionnaire was also filled out by one of the senior managers of Iran's Pharm ICLs. The questionnaires were distributed among above nine ICLs and 450 users, simultaneously. This was also followed by interviews, telephonic interviews, e-mails, etc to collect the required data and help out the respondents in filling out the questionnaires.

The ICLs' Questionnaire depicted information on bio data, profile of organization and facilities, collection, ICT facilities and services: networking, reprography, CD-ROMs and DVD-ROMs, user services, man-power applications, security and accessory to the system, grading the achievements of the objectives of ICTs, etc. The full version of ICLs' Questionnaire is given in **Appendix A**.

However, user's Questionnaire attempted to collect data on respondents' personal information, category, and years of experience. Then, the respondents were asked of place of locating information, the most used sources of information,

the ICLs' services used, the evaluation of these services, library staff's assistance, the methods of updating ICT knowledge, ICT facilities and services used, the problems in using ICT, databases, assessment of ICT knowledge and skills of staff, evaluation of ICT objectives, etc. The full version of Users' Questionnaire is indicated in **Appendix B**.

3.4. Statistical Data Processing

The data from both sets of Questionnaires was validated, processed, tailored, classified, coded, edited and entered into the computer. The statistical analysis of the data was carried out through descriptive (frequency and percentage) and inferential statistic (Chi- Square Test) using Statistical Package for Social Science (SPSS) software. The descriptive statistics were used to indicate the state-of-art of ICT facilities and services in ICLs, and the trend of use of ICT by the users. Inferential statistics including Chi-Square Tests (X^2) were used to test the observed differences and relationship between the research variables.

3.5. Analysis, Presentation of the Data and Drawing Conclusion

Firstly, the data were analyzed via SPSS program. They were presented in 73 Tables and 81 Figures. Excel software was also used to draw various charts and graphs. **Secondly**, the information illustrated were described and interpreted to account for the findings and draw conclusions. **Finally**, the findings of the research led to the examination of research hypotheses and fulfillment of the research objectives. Details are given in the next chapters.