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Research Article

The methodology of dissertations of Ardebli University of Medical Sciences during the years 2011 to 2014

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ABSTRACT

Background and objective: The study of quality of dissertations and projects for university education system is very important as it can help to improve the quality of dissertations. This study aimed to investigate the methodology of dissertations of ArdebliUniversity of Medical Sciences.

Methods: Theresearch was a descriptive - analytical one and statistical population included all dissertations defended in the years 2011 to 2014 in the Central Library of Ardebil University of Medical Sciences, totally 229 volumes. The researcher-made checklist approved by the research specialists was used to collecting data.

Results: The results showed that between the current situation and the ideal situation for all components of the methodology, including how to set up research design (2.9), subjects (1.73), measuring tool(1.45), methods (1.71) and expression of data analysis method (2.16) there is a significant difference,so third chapter of dissertations in Ardebil University of Medical Sciences entitled methodology, is less than the favorable situation. (The methodology is far from desirable condition).

Conclusion: The weakest part of the third chapter of the dissertations is related to research project design that is the beginning of research work.

Keywords: Methodology, dissertation (Thesis), University of Medical Sciences

INTRODUCTION

Universities and higher education institutions arealways considered as the highest centers of thinking and creation of knowledge in the society andby presence and activity of Intellectual thinkers, researchers, scholars and students are essential in the scientific promotion anddirecting intellectual, religious, cultural and political community movements of society (Azar, Khosravani, Jalali andDehdashti,2011). The nature of the higher education institutions that their goals are met in organized institutions consist of a science demanding group called "university", is not but the search for new truth and knowledge. The celebrated philosopher Whitehead (1967) believes that higher education institutions are not merely schools for training and the only reason that justifies the presence of universities and higher education institutions is the

discovery and preservation of the relationship between knowledge and truth with the general atmosphere of life (Naderi andSeifNaraqi,2012). Thus, the progress of any society is the result of research.Today, one of the most discussed issues in higher educationis research and specially thestudent research.

Research on the student dimension, reveals its main manifestation in the dissertation (thesis) course. Students selecting this coursecombine their initiative power, self-confidence and perseverance, with theirsearching spirit and present its result in the form of a dissertation (thesis); so it could be argued dissertation (thesis), is the first systematic step in the research that students are familiar with; thus students around the world are faced with the choice that they should write dissertations (thesis) with traditional structure in 4 to 5 chapters or present it asan article.Lundgren &Halvarsoonbelieve, in fact, the dissertation (thesis) is effective on the students' evaluation about their mental abilities, experimental and clinical skills as well as the scientific and rational maturity and provide a way to learn research methods and skills of critical analysis of published articles for students (Lundgren &Halvarsoon, 2009).Faculties of Medical Sciences conducting basic and applied studies play very important role in the development of society that an important part of this role can be done through reporting of research activities and in particular the number of articles published by them can be evaluated (Rezaeian, Salem, Dehghan, Saeedi, Iranmanesh, 2005).Thus the students' dissertations (theses) are considered part of the research works of university and as a research tool invoke the ingenuity and creativity of students to take step to solve the scientific, medical and health problems of community (Kolahi, Farsar, MolaviNojoomi, Kolahi andMalekAfzali,2003).The universitiesof medical sciences in addition to training students in different levels of education and diagnosis and treatment of patients referred to hospitals, also, are responsible for the infrastructure for research in medical group (Tabibi and Tofighi, 2011). Therefore, in medical universities also an important part of medical education is research training (Iranmanesh, Khazaei, Nasri, Moyini and Shakur, 2015), and it seems a good way of educating good researchers is encouraging medical students to write a research dissertation (thesis) (Kolahi et al. 2004). Thus in the course of medical training in Iran, the dissertation (thesis) has 6 courses to students during their studies be familiar with research issues and how to conduct an investigation.

Given the importance of proper framework of student dissertation (thesis) and the impact of this research process on the student's academic growth theneed to review the student dissertation (thesis) is felt. The study of the quality of student dissertations (theses) and projects is very important for university education system, because it can help to improve the quality of student dissertation (theses) (Regojo Zapata et al., 2004).

Lundgren &Halvarsoon have done a study entitled 'expectations, concerns (worries) and perceptions of student writing a thesis (dissertation) as a part of nursing education'. These researchers have enumerated the major concerns and problems of students in finding and selecting a topic (subject), writing barriers such as lack of familiarity with the scientific language and unfamiliarity with research and thesis (dissertation) writing method (Lundgren &Halvarsoon, 2009).Siemens and colleagues in a study in the Canada stated that the most important barriers to participation in projects related to the thesis (dissertation) from the perspective of students are their availability to supervisors, methodology teaching and lack of receiving proper feedback of their efforts (Siemens, Ronen and kanji, 2010). Nor Azmaand Noorizah in Malaysia UKM University found that the graduate students should be introduced with the knowledge of reporting methodology andresearch methodology (Nor Azma&Noorizah, 2014). Zeeneldin and colleagues in a study to assess dissertations (theses)which over 40 years have been conducted for the degree of Doctor of Medicine (MD) at the National Cancer Institute at the University of Cairo (NCI, CU) concluded almost 76 percent of

interventional studies and 24 percent of them have been observational and with the passage of time, both the quantity and quality of the MD theses had increased in MO (Zeeneldin, Diyaa, Moneer, Elgammal and Buhoush,2014).

In a study conducted at the Tehran, Shiraz and Iran University of Medical Sciences the results show that in terms of the application of research methodology in them since years 1976-1991 of 214 theses only 21 have fully met the criteria of a scientific investigation. Meanwhile, only 62 theses directly have pointed out to research methods (akrami, 1992).Khalili and Fallah showed that a total of 113 theses (83.1%) were research and the study type and in most of theses the variables definition in the materials and methodologypart have not been listed (Khalili and Fallahi, 1383).

Shahbazi and colleagues in a study examined "the accuracy of writing principles of the variables, the study population, sample size and sampling method of theses (dissertation) of Islamic Azad University, Dental faculty". The results obtained from 137 theses (dissertation) showed that the frequency of the writing inaccuracy of research variables, study population, sample size and sampling method on all indicators, was 40.2 and examining indicators the frequency of lack of sample size justification was 71 percent (Shahbazi et al., 2010).Khademiand colleagues in the School of Dentistry of Isfahanreported error percentages inthe formulation of hypotheses, objectives, statistical analysis and sample size (Khademi, Tavangar andHoseinpour, 2011).

NavehEbrahimand colleaguesstated the research workshops, providing courses on the principles of scientific writing and thesis writing and the regular evaluation oftheses (dissertations) and codifying guidelines toexplain different parts of the thesis as influencing factors on the quality of dissertation (theses) (Naveh Ebrahim, Mansooryan and Rahimi, 2014).

Considering the above, and given the fact that writing a thesis aimed at research training in medical universities,therefore, we can conclude that the most important part of a research work in general, and dissertation (thesis) in particular, is its methodology. Accordinglythe current study by examining theses of Ardebil University of Medical Sciences students' during the years 2011 till 2014 seeks to answer fundamental question following:

How is the methodological quality of dissertations of Ardebli University of Medical Sciences?

METHOD

This study in terms of its purpose and nature is a descriptive-analytic one. The population in this study included allthesesavailable in the Central Library of university that were defended during the years 2011-2014 and consisted of totally 229 theses which were evaluated by a number. In order to collect dataa researcher made checklist was used. To prepare the checklist, firstly using the library studies and literature review and a review of relevant literature it was attempted to extract the necessary components for methodology chapter, then using the research experts' commentswho wereresearch managers and assistants of universities of medical sciences academic were confirmed and by the use of Kendall rate of convergence those components with highconvergence list was used as checklist and the obtained checklist was adjusted to evaluate the third chapter of thesis (dissertation) in 26 fundamental components and in 5 itemsWhich consisted of: 5 items related to the components of research projects, 4 items ofcomponents related to the subjects, 6 items of measurement tool, 6 items of procedure (method) and 5 items of expression of data analysis were evaluated. The content validity of checklist was also examined by experts and confirmed. To determine the ideal situation, the checklist was provided to experts in order to they determine theitems importance in the 5points in a Likert scale.Thus hereby degree of importance of each of the items was determined as favorable and desired situation bynumerous experts.

To determine the current situation the method was such that after receiving permission from the Vice Chancellor for Research and Technological of Ardebi University of Medical Sciences and referring the Central Library, the third chapter of all theses (dissertations) which had been defended

during 2011 to 2014 were investigated, this mean whileextracting available general information, including sex and number of students, number of teachers and advisors and their position, proprietary information including writing the third chapter of thesis (dissertation) in the five basic components of: the research subjects, measurement tool, methods and expression of data analysis method were studied.

The information obtained from the evaluation of third chapter of theses (dissertations) as the current situation was compared with the professionals' expected situation and we calculated the gap between the ideal situation and the status quo.To analyze data using the software SPSS 22 the descriptive and analytical results of study were extracted and todetermine the difference between the current status and expected situation the chi-square test and one-sample t-test were used.

In order to comply with ethical principles of the current study, thenames ofparticipants in preparation of the checklist, as well as students, faculty members and theses advisors' namewere remained confidential and the results were presented overall.

FINDINGS

In this study 229 theses (dissertations) were examined. The authors of 100% of theses (dissertations) was on student. Of these, 115 subjects (50.2%) were male and 114 subjects (49.7%) were female.192 theses (dissertations) (83.8%) supervised byone supervisor and 37 theses (16.2%) by two supervisors. Academic degree of supervisors was: 9 professors (3.9%),120 associate professor (52%) and 97 Assistant Professor (47.9%), and academic degree ofinstructor was not found among supervisors (advisors).A number of 226 (98%) theses had advisors, of which 177 cases (77.2 %) had one advisor (supervisor) and 52 theses (22.7%) had 2 advisors. Academic degree of advisorsof16 theses wasunclear and 213 theses hadadvisors, about 207 cases (90.4%) had advisors with at least associate professor degreeand 6 cases (2.6%)hadacademic degree of instructor.

The method used in the 204 theses (89%) was applied research methodology, in 7 theses (3%) was basic methodology and 18 (7.8%) had used methods of research and development.

The distribution and frequency percentage of studied variables are presented in Table 1.

Table 1 The distribution and frequency of studied variables

Variable		The number of thesis	Percentage
Student's Gender	Male	115	50.2
	Female	114	49.7
The research methodology used in the thesis	Applied	204	89
	Basic	7	3
	Research and development	18	7.8
Academic degree of advisor	Assistant Professor	97	42
	Associate Professor	120	52
	Professor	9	3.9
The number of advisor	One advisor	177	77
	Two advisors	52	22.7

The results showed that of the 229 theses, 192 cased (83.8%) had only on thesis supervisor (advisor) and 37 theses (16.2%)had more than one supervisor (advisor).Chi-square test results showed that there is a significant difference between the status quo and ideal situation Ardebil University of medical sciences. Alsoof 229 dissertations (theses) at Ardebil University of medical sciences, 52 cases (22.7%) had more than one advisor (supervisor) and 177 cases (77.3%) did not comply with the rule of having more than one advisor (supervisor) and even 4 theses (dissertations) had no supervisor (advisor). Thus, the results showed that there is significant difference between the optimal situation and the status quo in terms of the number of advisors. This means the status in the Ardebil University of medical sciences is far from thedesirable condition according to experts.

In table 2 the Chi-square test results of supervisors and advisers are presented.

Table 2 The desirable indicators of supervisor and advisors

Input	Components	Observed	Expected	χ^2	df	sig
Number of Supervisor	Only one supervisor	Frequency 192	179.2			
		83.8 %	21.8	4.72	1	0.039
	More than one supervisor	Frequency 37	49.9			
		16.2%	78.2			
Number of advisor	More than one advisor	Frequency52	158.2			
		22.7%	69.1	230.8	1	0.000
	Only one advisor or without advisor	Frequency 177	70.8			
		77.23%	30.9			
The academic degree of advisor	At least Assistant Professor	Frequency 270	197.5		1	0.012
		90.4%	92.7	6.32		
	Less than Assistant Professor	Frequency 6	15.5			
		2.6%	7.3			

Based on the main variables that included components related to the third chapter oftheses, the results showed that the mean of desired state (4.6) and the mean of status quo of theses in Ardebil University of Medical Sciences (1.6) there is a gap on compiling (designing) the research plan (2.9). This means that all items related to the study design in the third chapter of dissertation (thesis) at the Ardebil University of Medical Sciences has a large gap with the ideal situation and the most gap is related toitems of explaining the methodology of quantitative or qualitative (3.5) and explaining the method in terms of purpose (3.4). In addition the single-sample t-test results showed that the total gap of research methodology items between the ideal situation and the status quo is significant at 99% confidence level.

The results showed that the total gap of subjects' components (items) between the mean of desired status (4.8) and the status quo (3.1) wasobtained 1.7. One sample t-test also showed that the gap is significant at a confidence level of 99%. This means that the status quo in subjects is low from the ideal situation. And the biggest gap was related to expression of possible accuracy to determine the ample size (2.62) and the method for determining the sample size (1.57).

In terms of measurement tool in the third chapter, there is a gap(1.4) between the status quo (3.2) and desirable condition (4.6). One sample t-test showed the difference and gap oftotal items is significant and the greatest difference and gapwas observed in items related to measurement toolof validity (3.4) and the measurement of tool reliability (3.4). Although there is a significant gap on total items, but the negative gap in the component of involving demographic characteristics in the questionnaire (-0.69) meaning better situation was also observed in Ardebil University of Medical Sciences.

The results showed that the mean of desired state (4.4) and the status quo (2.33) for the analysis of data in theses there is a gap (2.1) and this difference is significant at confidence level of 99%. This means that all items related to data analysis method in the third chapter of dissertation at the Ardebil University of Medical Sciences is largely far from the ideal situation.

The results showed that the lowest level quality of third chapter in the theses of Ardabil University of Medical Sciencesis related toresearch design (plan) writing with a mean of 1.6 and witha significant gap of 2.9. Also the poorest quality item of itemsassociated to third chapterwas related to items to determineresearch methods in terms of quantitative and qualitative with a mean of 1.1 and

gap of 5.3 and the measurement of the tool's validity and reliability with amean of 3.1 and gap of 4.3.

In table 4 single sample t-test results on each item of each component related to methodology of dissertations (theses) are presented.

The items of research design	Ideal situation	Status quo	t	Significance	Gap
	$\bar{x}$±sd	$\bar{x}$±sd			
Writing introduction	4.1±0.9	0.7±1.1	55.46	0.001	2.92
Explaining the methodology of qualitative or quantitative	0.7 ±4.6	0.6±1.1	84.70	0.001	3.55
Explaining the purpose of research (basic, applied or research and development)	0.6 ± 4.6	0.8±1.2	61.00	0.001	3.47
Explanation of the research methodology on descriptive or analytical or experimental or quasi-experimental	0.4 ± 4.8	1.6±2.71	20.40	0.001	2.16
Determining case-control or cohort studies or trials in analytical studies	0.5 ± 4.8	2.2±3.4	18.89	0.001	2.52
Total	4.6	1.6	85.7	0.001	2.9
Subjects' items					
Determining the research population in certain time and place	0.4 ± 4.8	1.2±3.4	17.62	0.001	1.42
The method for determining the sample size	0.3 ± 4.8	1.4±3.2	16.61	0.001	1.57
The expression of possible accuracy of sample size	0.4±4.7	1.6±2.1	24.62	0.001	2.62
Explanation of sampling method	0.3 ± 4.8	1.5±3.1	13.43	0.001	1.33
Total	4.8	3.1	22.36	0.001	1.73
The items of measurement tool					
Specifying tool or tools used to collect information (data)	0.3 ± 4.8	1.04±4.2	9.60	0.001	0.65
Including demographic characteristics in questionnaire	0.9 ±4.1	5.9±4.8	-1.72	0.008	-0.69
Description of applying method of measurement tool (Including accessories and supplies)	0.5 ± 4.7	1.1±3.8	10.57	0.001	0.83
The measurement of tool's validity	0.5 ±4.7	1.2 ±3.7	11.82	0.001	0.98
The measurement of tool's reliability	0.5±4.7	1.07± 1.3	48.60	0.001	3.44
Total	4.6	3.2	17.28	0.001	1.45
The procedure items					
Explain the research in chronological order	7 ±4.3	1.4±2.7	16.48	0.001	1.65
Charting the process of research	0.8±3.7	0.9±1.3	38.26	0.001	2.42
Referring to the test and how it done	0.5±4.6	1.3±3.6	13.10	0.001	1.18
Referring to the implementation details of research which not mentioned elsewhere	0.6±4.4	1.3±3.6	9.87	0.001	0.85
Specifying all the statistical methods used in the study	0.7±4.6	1.2±3.1	16.93	0.001	1.41
Specify the use of any statistics about each variable	4.4±0.8	1.3±1.6	31.8	0.001	2.8
Total	4.4	2.7	31.73	0.001	1.71
Data analysis method					
Explain how to adjust and tabloid of data	4.5 ± 0.6	2.6 ± 1.4	19.65	0.001	1.92
Referring descriptive statistics used to describe data	4.5 ± 0.7	2.9 ± 1.4	17.88	0.001	1.65
Referring to inferential statistical methods used to analyze the findings	4.6 ± 0.6	3.4 ± 1.4	12.96	0.001	1.24
The reason for use of statistical tests	4.1 ± 0.9	1.3 ± 0.9	48.96	0.001	2.80
Providing statistical tests and tables	4.6 ± 0.6	1.4 ± 1.1	45.11	0.001	3.18
Total	4.7	2.3	40.39	0.001	2.16

DISCUSSION AND CONCLUSION

The research was conducted to investigate the research methodology in students' theses at the Ardebil University of medical sciences. The results showed that 89% of theses are applied research. The results are similar to results of some studies in Iran which showstudents have less willingness to conduct fundamental (basic) and R & D studies (Borghei2004), (Javaheri2007), (Zarshenas, Shaghaghian, MomeniDanaei,

Tabatabai, 2012), which can be because of practical problems and lack of proper facilities such as students lack of time and high costs to do such studies. One of the results of the present study was merely one student as a researcher in all theses and one supervisor was present in a large number of theses.McDermott in a 20-years study from 1971 to 1991 showed that over the years, multicenter studieshave been increased from 10% to 39%. This increase reflects the improved design of studies in the study area (AminiSani,Sezavar andLotfollahzadeh, 2004). In explaining the status difference in the University of Medical Sciences it can be said since multicenter studies in addition to difficult design, need much time, cost and teamwork. Lack of multicenter studies or absence of more than on supervisor or advisor can indicates weakness in the ability to perform teamwork by professors or students of Ardebil University of medical sciences that requires a culture of teamwork among teachers and students.The results of Naghizadehand colleagues' study at the Ardebil University of medical sciences which had investigatedthe obstacles to research from the perspective of faculty members (Naghizadeh, Khan Babazadeh, Samari, 2015) confirms this fact, so that lack of interest in teamwork was reported as one of the major research obstacles. And that could be one of the reasons for the results of current study.

The results of the main variables of study showed there is a significant gap between the ideal situation and status quo in most of the items of all the components of project (thesis) methodology which represents major defects in components of the methodology. Although no study was found tocompare the status of the third chapter with favorable situation, but our results are consistent with many other studies that somehow have addressed the methodology of theses (dissertations), for example Zarshenas et al in their study indicated that study type, sampling method, how to determine the sample size, reliability and validity of data collecting toolwere not reported correctly in Shiraz dental theses (Zarshenas et al 2011).The results of Khalili and Fallah study are alsoconsistent with our results (Khalili and Fallah, 2005). Shahbazi and colleaguesreported all indicators related to methodology equal to 40.2%and ignoring the sample size equal to 71% (Shahbazi et al., 2010) which is similar to current results. In additionKhademi and colleagues in their study at the Isfahan University of Medical Sciences reported error percentages in the formulation of hypotheses, objectives, statistical analysis and sample size (Khademi, Tavangar and Hoseinpour, 2011), which are consistent with some of our findings.NavehEbrahim and colleagues although evaluate the methodology of dissertations at the Khwarizmi University relatively desirablebut they report research methodology placed in the lowest rank, and in most theses the research method in terms of purpose, implementation process, outcomes or results had not been mentioned as well as lack of justification of sampling method has been mentioned as major problem in third chapter of thesis (NavehEbrahim and colleagues, 2014) that all of them are correspond with our results.

The results showed that the research methodology of theses at Ardebil University of medical sciences is not so favorable. Based on available data we can conclude that the existence only one Supervisor or one advisor for theses shows the unwillingness of teachers and students to teamwork. Also, the students are weak in writing research methodology so that the weakest part of the third chapter is related to researchdesign that is the beginning of a researchwork and this defect could undermine all results.

SUGGESTIONS

It seems that more and more precise oversight on the process of writing students'theses should beimposed by authorities and to raise students' knowledge about the proposal and writing a thesis byprovidingeducational pamphlets or holding research workshops for students,the qualitative improvement of third chapter to be pursued. In addition encouraging teachers and students to do teamwork and the use of statistical adviser in theses (dissertations) can be effective in improving the quality of theses (dissertations).

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