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## Investigation of measurement tools properties used in nursing dissertations in Isfahan in 2015

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### ABSTRACT

Reliability and validity of measurement tools in master dissertations is essential in flawless evaluation of research result. It ensures that collected data by these tools help in achieving results of study. Therefore, this study was conducted to investigate the properties of measuring tools used in nursing dissertations in Isfahan in 2015. this research is descriptive type of study. For this purpose, 237 dissertations of Medical Science University and 125 dissertations of Islamic Azad University were selected and analyzed using census sampling method. Data on properties of measuring tools used in them were collected by researcher-made information recording form. To analyze the collected data, descriptive statistics using SPSS software was used. in this study, the most common measuring tool at the dissertations was questionnaire and 50.5% of them made by researcher. In the majority of dissertations, the validity and reliability of researcher-made and standard tool had been evaluated. Researcher-made tools in most cases investigated using content validity and test-retest reliability. In 54.3% of the cases, validity had been examined by referring to reference, while reliability had been examined by Cronbach's reliability. Among the standard tools used in the dissertations examined, the validity and reliability for the tools for the available sample had not been re-examined in majority of dissertations. In studies where physiological measurement tools have been used, properties of these tools have not been considered in the majority of cases. the findings suggest there are some problems in the process of proving the validity and reliability of measuring tools used in dissertations, requiring that researchers, supervisors, and referees to pay enough attention for this issue.

**Keywords:** measuring tool, dissertation, validity, reliability

### INTRODUCTION

Dissertations are major sources of knowledge having significant importance at universities. In fact, dissertation is teaching the knowledge, skill and methodology of research for students. On the other hand, any dissertation is considered as a model for other students who refer to it as reference in the conventional structure of the university. Therefore, high quality dissertations are required to guide students [23]. Nursing, as a profession, plays key role in caring people in various situations related to health and providing high standards of health. In addition, development of nursing and changing its policies are possible based on research findings. Given the resources and expenditure

spent for each dissertation in the country, this field requires scientific criticism of studies related to the profession and its results. In order to maintain the proper balance between current knowledge and practice, nursing research should be guided in the right direction so that its results to have scientific accuracy and the spent resources have positive effects [7]. In conducting a study, after selecting the subject and determining the goals, the most important, sensitive, and challenging stage is selecting the research tool in achieving the goals of the study. To conduct his research, researcher should select tools to help him in achieving the goals of study. The selected tool should help him to find research questions answer easily, accurately, and quickly with low-cost [14].

Measuring tool is means used to measure concepts or variables considered by researcher, making data collection process more specific and more objective [16]. Using the measuring tool is different depending on the subject area of research [14]. In management dissertations, the mostly used tool is questionnaire and the less common tool is the observation method [10]. Most researchers tend to use a tool that its reliability and validity have been proven already by other researchers. Using pre-made forms may shorten the process of collecting data and increase coordination in collecting data [39].

Each measuring tool, regardless of the cost spent for its development, should include basic criteria. In texts related to theory of measurement in 1978, usually two desirable properties have been accepted to measurement tools including reliability and validity. Validity and reliability are two basic components of the data collection tool and they cannot be replaced. In 1987, sensitivity was introduced as the third property [40]. The reliability of a measure refers to its consistency over time and it indicates the error rate of measurement method. Reliable sizes increases the power of study in exploring the differences and relation in the studied population. Reliability test emphasizes on three aspects of stability, equivalence and homogeneity [43]. Validity of a tool indicates that how much the tool can measure the concept or structure.

According to Psychological Association of America, validity reflects appropriateness, significance, and usefulness of inferences from scores of a tool. The researcher does not determine if a tool has validity or not. Validity of tools is measured in terms of content validity, face validity, criterion validity and construct validity [31].

In order to increase the accuracy of the methods of studies, the managers of medical education have paid increased attention to validity and reliability of measuring tools. However, the quality of the published dissertations is lower than optimal level and it is needed that research to be conducted to show property of tool in sophisticated way. The method used in the dissertation determines largely the confidence of interpretations made form results of the paper [33]. No study has been conducted so far considering the properties of measuring tool in nursing dissertations in Isfahan city both inside and outside of the country to provide an insight with regard to scientific status of nursing in Isfahan city. The current study provides an image of the research tools used in nursing master dissertations written in Isfahan. The results of this study will identify existing gaps and make aware students and professors of the current situation of dissertations. It also help them in improved use of measurement tool so that guide future studies properly. The present study has been done with the purpose of determining the measurement tools properties used in nursing dissertations in Isfahan in 2015.

## MATERIALS AND METHODS

In the current study, 479 nursing master's dissertations available in the library of Department of Nursing and Midwifery in Isfahan University of Medical Sciences and 228 nursing master's dissertation in Department of Nursing and Midwifery in Islamic Azad University of Isfahan were examined using census sampling and descriptive approach. Tool used to collect data in this study was researcher-made information recording form. To obtain scientific validity, content validity was used and to obtain scientific confidence, internal continuity with Cronbach's alpha coefficient of 0.910 technique was used. The method of gathering data in this was structured observation in which researcher visited the Department of Nursing and Midwifery in Isfahan University of medical sciences and the Department of Nursing and Midwifery in Islamic Azad University of Isfahan (Khorasgan Branch). The data were collected from library department of the mentioned universities.

In the current study, demographic information and status of measuring tool variable in nursing master's dissertations were evaluated. Collected data were analyzed using SPSS software.

## RESULTS

The greatest number of dissertation has been written at the Medical Sciences University of Isfahan (32.5 percent) between the years 1992 and 1996 and at the Islamic Azad University (91.2 percent) between the years 2012 and 2015. The greatest number of dissertations have been written at the Medical Sciences University (68.8 percent) and at the Islamic Azad University 78.8 percent) and at two universities (71.5 percent) by female students. The greatest number of dissertations at the Medical Sciences University (38.8 percent) and at the Islamic Azad University 52.8 percent) and at two universities (43.1%) have been written by and internal surgery students. In both of the universities, only one professor has supervised majority of dissertations so that only one professor has supervised 55.3 of the dissertations written at Medical Science University and 100% of the dissertations written at Islamic Azad University, and 70.7% of total dissertations written in two mentioned universities.

Accordingly, 237 dissertations written at Medical Science University had 406 supervisor, and 125 dissertations written at Islamic Azad University had 125 supervisor. In total, 531 professors supervised dissertations written at these universities. Majority of dissertations (58.2 percent) were supervised by professors who had master degree at both universities. Majority of dissertations of both universities (61.6%) have been written without supervisor. Majority of dissertations (27.1%) written in both universities have been conducted by semi-experimental method. At both universities, the majority of dissertations have been conducted only by using a measurement tool so that one measurement tool was used in 58.0 % of the dissertations written in these universities and 602 measurement tools were used in the dissertations written in these two universities. In both universities, the most common used measurement tool was questionnaire so that 73.1% of the dissertations at both universities have been conducted by questionnaire. Among measurement tools used by students (except physiological tools), majority of the dissertations written in these two universities used researcher-made measurement tools (50.5%). Among researcher-made tools considering the studied dissertations, validity of tool has been investigated in majority of dissertations (85.7). The most common method to examine the validity in dissertations of both universities was content validity so that 99 percent of the tools were examined by content validity. Among researcher-made tools used in investigated dissertations, tool of measurement has been investigated in majority of dissertations written at both universities (62.4). The most common method to examine the reliability in researcher-made tool in dissertations of both universities (41.8 percent) was test-retest method. In addition, in terms of reliability value, the highest frequency observed among dissertations was reliability of between 70 and 90% in tools used in these dissertations. The mean reliability value of researcher-made tools in two universities was  $0.87 \pm 0.08$ .

Among standard tools used in the studied dissertations, the validity of tool in majority of dissertations written in both of these universities was reported 57.8%. In majority of these dissertations, validity has been reported by referring to reference without mentioning its type so that validity of 54.3% of used tools has been reported by referring to reference.

Among standard tools used in studied dissertations, the reliability of tool has been reported 70.6 in majority of dissertations written at Medical Science University, 81.4% in majority of dissertations written at Islamic Azad University, and 75.3 % in dissertations written in both universities.

The most common method of reliability in the standard tool (61.9 percent) was Cronbach's alpha. Additionally, in terms of reliability, the highest frequency among dissertations of both universities (57.1 percent) related to measurement tools with the reliability of 90-70 percent. The mean value reliability of standard tools in all dissertations of both universities was  $0.84 \pm 0.09$ .

Among standard tools used in the studied dissertations, the validity of tool for sample available in majority of dissertations in two universities (69.1%) has not be re-examined. In cases where the validity of the standard tools for available sample had been re-examined, the most common method to examine validity in dissertations of both universities was content validity, so that 97.0 percent of tools used have been examined using content validity. Among standard tools used in studied dissertations, the reliability of tool in the available sample for majority of dissertations of both universities (71.7%) has not been re-examined. The most common method to examine reliability of tool in the available sample (63.3%) was Cronbach's alpha. Additionally, in terms of reliability, the highest frequency observed among dissertations of both universities (57.1 percent) related to measurement tools with the reliability of 90-70 percent. The mean value reliability of standard tools in all dissertations of both universities was  $0.87 \pm 0.07$ .

Out of 102 psychological tool used by students of University of Medical Sciences, manometer (19.6 percent) was the most commonly used tool. Out of 15 physiological tools used by students of Islamic Azad University, weight was the mostly used tool (26.7 percent). In dissertations of both universities, weight and manometer were the mostly used tool (17.9%). In studies where physiological measurement tools have been used, properties of these tools have not been studied.

### DISCUSSION AND CONCLUSION

In dissertations of both universities, the use of one type of measuring tool has the highest frequency and the lowest frequency related to use of six measuring tools. In a study conducted by Zachariah and Meru in 2014 to evaluate the validity and reliability of master's degree dissertation in the social sciences, half of the dissertations used only one tool. This result was in line with current study result. In general, 73% of dissertations of two universities have been conducted by using a questionnaire. Frequency of other tools in dissertation of two universities respectively is as follows. Khastar et al in 2011 conducted a study to evaluate the methodology, analysis method, and data collection tools in dissertations of Public Administration from 1998 to 2007 defended at Tehran University. They concluded that 68.0% of the dissertations used questionnaire, 17.0 % of them used interview form, and 2.0 % of them used checklist. This result in in line with the result of current study in terms of frequency of tool used. According to the results of the study conducted by Azizi and Farhikhteh in 2013, frequency distribution of components of the methodology used in the marketing dissertations of four universities of Tehran, 97% of the dissertations used questionnaire, 13.7% of them used interview form and 1% of them used checklist. This study is in line with the current study in terms of the most common tool used. Enjin in 2011 evaluated the tools used in the PhD dissertations of educational sciences in Turkey. He concluded that 63% of them used scale, 30% of them used interview form, and 12% of them used observation as tool that is inconsistent with current study. Zachariah and Meru in 2014 examined the psychometric properties of a data collection tools in Social Sciences dissertation in Turkey. They concluded that 48.3 percent of them used scale, 13.1% of them used questionnaire, 7.7% them used interview form, and 2.1% of them used checklist that is not consistent with results of our study. In medical science dissertations, according to different variables measured, discrepancy in frequency of using tool is not unexpected.

Out of 102 physiological tools used in dissertations of two universities, weight and manometer had the highest use (17.9 percent) by students. Purkakhki et al in 2007 examined and criticized measuring the validity and reliability of biophysiological tools used in master dissertations in Department of Nursing and Midwifery at Shahid Beheshti University of Medical Sciences. They concluded that among 343 samples, 7 of the dissertations used physiological tool and mostly biophysiological tool used in medium were microscope and thermometer. These findings are inconsistent with the results of current study.

In majority of dissertations of both universities, measuring tool was mainly researcher-made tool (50.5%). The results of the study of conducted by Sefik et al in 2012 in determining the validity and reliability of the data collection tool used in evaluation plan of studies in Turkey showed that most of the tools used have been made by researcher. This finding was in line with the current study. In a study conducted by Zachariah Meru in 2014 to examine the validity and reliability of master dissertations in the social sciences, it was shown that half of the used tools were researcher-made tool.

Among the researcher-made tools in the studied dissertations, tool validity in majority of dissertations (85.7%) had been investigated. The most common method to examine the validity in dissertations of both universities was content validity so that 99% of used tools have been investigated using content validity. Based on the results of the study conducted by Sefik et al in 2014 to determine the validity and reliability of the data collection tools in evaluation plan of studies in Turkey, the method used in 50% of researcher-made tools to prove the validity was content validity.

Among the most common tools in the studied dissertations, the standard tool reliability standard has been considered in majority of dissertations of these two universities 97.8%. Results indicated that almost in less than half of dissertations, standard tool reliability has not been considered. The most common validity method of standard tool considered in dissertations of both universities was validity by referring to reference. It means that researchers have referred to reference proving the validity without mentioning the type of the validity. 54.3% of the tools used have been considered by referring to reference. It should be mentioned that in 5.6% of the cases, reliability proving methods such as re-test, correlation coefficient, internal consistency and linear regression were considered mistakenly as method to prove the validity.

Among the standard tools used in the studied dissertations, tool validity for sample in majority of dissertations of both universities (69.1%) has not been re-examined. In cases where validity of standard tool for available sample has been examined, the most common method to examine the validity in dissertations of both universities was content validity so that 97% of tools used have been investigated using content validity.

Enjin in 2011 examined the tools used in the educational sciences doctoral dissertations in Turkey. He concluded that validity levels in measuring tools have had shortcoming and they vary from 4.74 to 0.37 on average. Zarshenas et al in 2012 investigated the quality of methodologies of dissertations of PhD dental students in General Dentistry Department. They concluded that in 66.2% of dissertations, the validity of measurement tool has not been referred. Janet et al in 2011 conducted a study with the aim of identifying the properties of the measurement tool used in health care research. They concluded that the validity in 50% of the cases has been proved using content validity. Azizi and Farhikhteh in 2013 found that 86.2% of dissertations used content validity, 10.2% of them used face validity, and in 2% of them, the method to prove the validity was unknown. These findings are in line with the results of the current study.

Among the researcher-made tools used in studied dissertations, the reliability of the tools has been examined in majority of them (62.4%). In other words, in one-third of the all dissertations, it has not been examined. The most common method to examine the reliability in the researcher-made tool (41.8%) was re-test. Based on the results of the study conducted by Sefik et al in 2000 to determine the validity and reliability of the data collection tool in evaluation plan of studies in Turkey, the method to prove the reliability in 58% of researcher-made tools was Cronbach's alpha. This result is not in line with result of current study.

Among the standard tools used in the investigated dissertations, the reliability of tool in majority of dissertations of both universities (75.3%) has been considered. The reliability of standard tool has been investigated in the majority of dissertation of both universities (61.9%) Cronbach's alpha. In terms of reliability value, the mostly observed reliability among the dissertations of both universities (57.1%) related to measurement tools with reliability of 70-90%. Then value of reliability of standard tools in dissertations of both universities was  $0.84 \pm 0.09$ . In 13.1% of the cases, the value of reliability was unknown.

These findings suggest that researchers, supervisors, and referees did not have enough information about the kinds of tools or showed no required sensitivity in providing their feedback. Janet in 2011, quoted by Stabroek, stated that all current studies have significant shortcoming in properties of tools used. The results of this research indicate that there are some problems in the process of proving the validity and reliability of measuring tools. It is necessary that researchers, supervisors, and referees to pay enough attention to this issue. In addition, the issue that those dissertations have not considered these properties and developed by supervisors and referees is worth discussing.

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