
The Relationship Between Learning Style and Undergraduate Nursing Students' Academic Achievement in School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

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Abstract: Background: The Learning style has been the focus of numerous studies, but it remains complex and affected by many factors. Nursing students should learn large quantities of theoretical content in a short period of time. Objective: The Relationship between Learning style and undergraduate nursing students' Academic Achievement in School of nursing and midwifery, Tehran University of Medical Sciences, Tehran, Iran Methods: A correlational cross sectional study was conducted. The subjects of this study were Undergraduate nursing students 232 from school grades of years attending to school of nursing and midwifery of Tehran University of Medical Sciences. Data was collected from students through an anonymous learning style questionnaire. The questionnaire was divided into three sections including (a) demographic profile (b) Kolb's Learning Style Inventory (c) Academic achievement. An initial version of the questionnaire was piloted on a small group of nursing students as the context was validated by a panel of expertise in nursing education. All ethical considerations were applied in this study. Data analysis was carried out by using the latest version of the statistical software package SPSS (Version-21). Descriptive and analytical statistical test were used to analyze the data. Results: A total of 232 participated in study of relationship between learning styles, and undergraduate nursing students' academic achievement. One hundred –Forty three participants were female (61.6%), and 89 respondents were male (38.4%); 60.8% were between 20 and 25 years, 33.6% were <20 years, and 5.6% were >25 years old. The most frequency learning style of students was Abstract Conceptualization (37.5%). In addition, Active Experiential (30.17%), Reflective Observation (19.83%) and Concrete Experiencing (12.5%) were in the next order in LS of students. The majority of subjects (52.8%) their academic achievements were at level of Good (the Median score were between (13-16). There was no significant relationship between Learning style and Academic Achievement ($P > 0.05$). There was a relationship between Learning styles and gender ($P < 0.05$). There was a relationship between learning style and academic level ($P = 0.041$). Conclusion: Not all students are self-directed, and this study suggests that mature students are more self-directed than that entering nurse education direct from high school. Nurses' educators need to assess the Learning style and preferences of their students in order to determine the appropriateness of Self-Directed in learning.

Keywords: LS, Academic Achievement, Nursing Students', Iran, Undergraduate Degree

1. Introduction

Learning style is a concept that is important not only in shaping teaching practices, but also in highlighting issues that help faculty members and administrators think more deeply about their roles in facilitating student learning. Nurses are called upon to broaden their scope of practice and

to master technological tools and information management systems while coordinating care across teams of health professionals. As nursing education is charged with the responsibility to prepare nurses to enter a workforce that is complex, uncertain, and constantly evolving, the National League for Nursing recognizes that a critical goal for the future is to endorse academic progression options for all

nurses (1). Learning appropriate with academic field could lead to student's achievement and regarding that no significant difference was observed in academic achievement and functions of thinking styles based on the student's learning style (2). Based on a study examining the relationship between knowledge, awareness and student's learning styles (3) reported that knowledge and awareness are important key elements in teaching and learning process. It can help to develop, design and delivered educational program and enhance the student to learn. When there is coordination between teaching styles and students learning styles probably will effects on learner's attitudes and their academic achievement. For example, in Australia (2008), undergraduate paramedic students' preferred to have two learning styles including the diverger style of learning (31%) and the accommodator style of learning (26.5%) (4). Kydiam have reported that approximately 65% of the population is visual learners (5). Few study presented a useful baseline data to determine the most current LS among students and its association with functionality of thinking style and academic achievement in school of nursing and midwifery of Mashhad, Iran. Self-administrated Kolb-LSI and functions of thinking style questionnaire were conducted in 2011 with 214 nursing and midwifery students. Data were analyzed by using both descriptive statistics (mean and standard deviation) and inferential statistics (Pearson correlation coefficient, MANOVA, and Chi-square). The study findings was indicated that learning styles of majority of students were absorbent and there were significant differences among the prevalent learning styles of total students ($p=0.000$), but there was no significant between the prevalent LS of male and female students. Moreover, there was no significant difference in academic achievement and functions of thinking style based on the student's learning styles (A study was conducted in Egypt which used to investigate that how LS and preferred learning approaches influence student's LS and academic achievement in nursing faculty (6,7) and prefer their learning styles: Read and visual learning (19.4%). (6,7) Moreover, a number of studies showed that there are significant relationships between LS preference and academic achievement. Also, learning styles affect the way of students learning process (8). There were positive significant relationship between thinking styles and academic achievement (9). Improving and promoting of the academic achievement of nursing students demands have been critical role play on student's type of thinking style. Furthermore, the result showed that there was positive correlation between academic achievement and Active experimentation; while convergers had the highest grade point of average and the highest critical thinking attitude. However, the study finding also indicated that only identified the predominant LS in nursing students (10). A study conducted by Zarei (2012) who examined students' critical thinking skills in Iran. The study showed that critical thinking skills are important as contextual of developing human knowledge and identifying the related factors and developing knowledge may help to reduce individual problems. Furthermore, the result showed

that there was positive correlation between academic achievement and active experimentation; while convergers had the highest grade point of average and the highest critical thinking attitude. However, the study finding also indicated that only identified the predominant learning styles in nursing students (10). The purpose of this study was determined the relationship between learning style and undergraduate nursing students' academic achievement.

2. Methods and Materials

2.1. Study Area and Period

The study was conducted in the school of nursing and midwifery, TUMS, Tehran, Iran. The study was conducted from March, 2013 to February, 2014.

2.2. Study Design

A correlational cross-sectional study was conducted to determine the relationship between Learning styles, Self directed in learning in Learning and undergraduate nursing students' academic achievement in TUMS, Tehran, Iran.

2.3. Study Population

All undergraduate nursing students who attended at the school of nursing and midwifery and they can full fill the criteria for inclusion were enrolled in the study. Each undergraduate nursing student who attended at the school of nursing and midwifery that can fulfill the criteria for inclusion was enrolled in the study. Sample characteristics was also (a) Not any work experience as a teacher among the participants, (b) The participants should be native Persian speakers, and (c) Age ≥ 17 years

2.4. Sample Size

The sample size was determined by employing stratified population in order to determine statistical formula. Formula the size was determined. The study was included at least 221 students, then the total students who enrolled at study area is 743 nursing students (11). The required minimum sample is obtained and with 5% non-response rate of total were calculated 232 were obtained.

2.5. Sampling Techniques

All undergraduate students from the total number of students about 232 were selected. The method of sampling Quota Stratified Sampling Techniques (QSST). Total undergraduate nursing students in the school from 2009-2013 were about 743 persons (Refer to Tasble.3). Regarding the sampling technique, study group from the source of population were choices for each academic year of the nursing study (year 1-4). The total participants were 67 from academic year one, 69 from second academic year, 65 from year three and 31 from academic year four nursing students in Tehran University of samples through quota stratified sampling techniques.

2.6. Instruments and Measurement

The questionnaires were self-administered and consists of: Socio-demographic characteristics which includes: Age, Sex, Marital Status, Permanent residence, Living area, Department, grade level, academic achievement, Average hours of independent study, Average hours for social activities, and students study planning. It was consists all these variables and each variable have their own options.

Learning styles questionnaires: On Kolb's LS in nursing student's questionnaire. For Learning styles was used the Persian Version of the Kolb's Learning style Inventory and Self directed in learning in nursing students 'was used the Persian Version of the Self Directed in learning readiness in Nursing students which were showed valid and reliable instruments. The Kolb's Learning style inventory questionnaire consists of 12 -items with 1-"least like you", 2-"Third most like you", 3-"Second most like you", and 4-"Most like you" grading option. It requires the respondents to rank order, their preferences. It classifies an individual's LSs based on 4 major kinds of capability. The inventory measures an individual's relative emphasis on 4 learning modes or scales: Concrete Experiencing, Reflective observation, Abstract Conceptualization and Active Experiential (12). Academic Achievement: Academic Achievement was measured using students' final grades for the courses taught by the case method (11). We were used the scale of 20 for academic achievement of nursing students. A measurement of individual grade of scaling from "Excellent" to "good" to "acceptable" to "weak". It is classified scales; 18-20 which indicates "Excellent", 16-18 indicates "Great", 13-16 indicates "Good", 10-13 indicates "Acceptable" and 0-10 indicates "weak" of students' academic achievement.

2.7. Data Collection Procedure

Data was collected from students through an anonymous self-administrated questionnaire. The questionnaire was divided into three sections including (a) demographic profile, (b) Kolb's Learning Style Inventory, (c) academic achievement. An initial version of the questionnaire was piloted on a small group of nursing students as the context was validated by a panel of expertise in nursing education. All ethical considerations were applied in this study. The time which allowed filling all questionnaires for one participant was 30 minute but they could take more time.

2.8. Data Processing and Analysis

Pilot tests were carried out during the development stages of the survey. A small number of non-sample group nursing students were completed the instruments before we were administer to the actual sample group. Based on these types of tests some error and ambiguities may be found and rectified. The times taken to complete the instruments were also being noted from the pilot tests. This was aided in the logistical planning for the administration of the instruments. The data of the questionnaire from the pilot group was processed for determining an internal consistency reliability

coefficient. The alpha- Cronbach's value of 0.98 indicated a high reliable of the questionnaire to determine the relationship between LS, and Undergraduate nursing students' academic achievement. The investigator also was carried out pilot study to ensure content and face validity. The content of validity of the translated instruments were approved/checked by advisor, professors, research coordinators, persons in the field of education in school of Nursing and Midwifery, Instructors agreement instead of the translated LSI and the concepts that characterize learning style, all questionnaire. But also the investigator was carried out a pilot study to ensure reliability (13, 14, 15) The SPSS version 21, software program was used to analyze the data. The data was analyzed using descriptive measures of central tendency including means and standard deviations to determine the range and differences between the scores. The Pearson product moment correlation provided information on the relationship between LS, and undergraduate nursing students' academic achievement. Chi-square and T-tests was used to employ to determine variations in academic achievement among nursing students. The level of significance for the study was considered $p < 0.05$. The Inferential statistics was calculated using all the participant scores as well as course subgroup.

2.9. Operational Definitions

Learning style: LS refer to performance way of information processing as determined by learning style inventory. In this study, learning style inventory describes the way student learn and how student deal with ideas and day to day situations in their life and the instrument which consists of 12 sentences with 4 option or prioritized ways (16.) Grading the option for each sentence according to how well you think each one fits with how you would go about learning something. In addition, the grading scale: 1- indicates least like you; 2- indicates third most like you; 3- indicates second most like you and 4- indicates most like you. A measurement of individual sense of ranging from "least like you" to "third most like you" to "second most like you" to "Most like you". The instrument is a 12-items five-point linker scale. Scores was assigned as 1-12 for "least like you", 13-24 for "third most like you", 25-36 for "second most like you", 37-48 for "Most like you" LS in nursing students (17).

Academic achievement: The final Grade point average obtained from courses taught. In this research, it was used the scale of 20 for academic achievement of nursing students. A measurement of individual grade of scaling from "Excellent" to "good" to "acceptable" to "weak". It is classified scales; 18-20 which indicates "Excellent", 16-18 indicates "Great", 13-16 indicates "Good", 10-13 indicates "Acceptable" and 0-10 indicates "weak" of students' academic achievement.

2.10. Data Quality Control

To ensure the quality of data, first the questionnaire was pretested. The pretest was conducted in 55 of the participants at randomly selected undergraduate students ways from the study setting. Training was given for the data collectors and

supervisors before the actual data collection. Every day after data collection, questionnaires were reviewed and checked for completeness, accuracy and clarity by the supervisors and principal investigators.

2.11. Ethical Consideration

The study was approved by the Ethical Review Boards of Tehran University of Medical Sciences, School of nursing and Midwifery, Tehran, Iran .Verbal consent was obtained from each study participants. In addition, written consent was obtained officials before conducting the study. The ethical

committee approved the consent procedure since the study had no any harm to the study participants.

3. Result

The result of F-test indicates (table 1) that there was no significant relationship between LS and Academic Achievement ($P > 0.05$). The result also indicated that the highest mean score of participants, who are mainly using AC learning Style, had great scored.

Table 1. Relationship between students' learning styles and academic achievement.

Learning Style	Academic Achievement					F-test
	Acceptable 10-13	Good 13-16	Great 16-18	Excellent 18-20	Total	
	Mean±S.D	Mean±S.D	Mean±S.D	Mean±S.D	Mean±S.D	
Concrete experience	28.62±4.646	28.69±5.038	28.10±4.606	24.33± 3.786	28.39±4.836	F=0.972 P=0.407
Abstract conceptualization	31.15±3.602	30.99±6.146	33.16±6.363	34.00±2.646	31.91±6.157	F=2.332 P=0.075
Reflective observation	30.31±3.728	30.06±5.513	28.40±5.842	28.67±5.508	29.39±5.592	F=1.655 P=0.178
Active Experimentation	30.46±7.827	30.34±5.615	30.44±6.512	33.00±4.359	30.43±6.083	F=0.185 P=0.907
Total	120.54±1.127	120.08±1.038	120.10±0.654	120.00±0.000	120.12±0.904	F=1.022 P=0.387

Table 2 shows that students in this study had mainly AC learning styles. Although female students had a higher AC mean score than male students (32.36±6.408; 31.02±5.717 respectively) but there was no statistically relationship between LS and Gender. In addition, students in age between 20-25 years old had a higher AC mean score than other

groups. There was no statistically relationship between learning style and age classification, academic level. However, there was relationship between AC learning style and academic achievement (F=4.890; P=0.003) and AE learning style and academic achievement as component.

Table 2. Students' learning styles according to some of demographic characteristics.

Variables	Description	Concrete Experience		Reflective Observation		Abstract Conceptualization		Active Experimentation		Total	
		M±SD	F P	M±SD	F P	M±SD	F P	M±SD	F P	M±SD	F P
Sex	Female	27.86±4.848	F=2.482 P=0.117	32.36±6.408	F=2.57 P=0.110	29.35±6.102	F=0.049 P=0.824	30.57±6.292	F=0.001 P=0.972	120.13±0.906	F=0.648 P=0.422
	Male	28.90±4.941		31.02±5.717		29.52±4.578		30.60±5.900		120.03±0.923	
	Total	28.26±4.899		31.84±6.174		29.41±5.55		30.58±6.132		120.09±0.911	
Age (Year)	<20	27.59±4.96	F=1.265 P=0.284	29.06±5.317	F=0.233 P=0.792	31.76±5.955	F=0.112 P=0.894	31.58±5.863	F=2.029 P=0.134	119.99±0.781	F=1.034 P=0.357
	20-25	28.67±4.992		29.58±5.655		31.96±6.231		29.93±6.306		120.13±0.781	
	>25	27.85±2.940		29.69±5.893		31.15±7.244		31.62±5.157		120.31±0.855	
	Total	28.26±4.899		29.41±5.557		31.84±6.174		30.58±6.132		120.09±0.911	
Academic year	First year	29.03±5.102	F=1.012 P=0.388	29.64±5.022	F=0.928 P=0.428	31.47±5.754	F=4.890 P=0.003	29.83±6.202	F=2.748 P=0.044	119.97±0.942	F=0.804 P=0.493
	Second year	28.36±4.567		29.11±5.479		30.42±5.535		32.22±6.271		120.11±0.848	
	Third year	27.63±4.712		28.88±5.920		34.18±6.151		29.52±5.829		120.22±0.944	
	Fourth Year	27.74±5.568		30.77±6.009		31.03±7.273		30.52±5.750		120.06±0.929	
	Total	28.26±4.899		29.41±5.557		31.84±6.174		30.58±6.132		120.09±0.911	

4. Discussion

The fourth objective was to determine any relationship

between LS and nursing students' academic achievement in TUMS. The current study shows there was no significant relationship between learning styles and academic

achievement. The highest mean score of participants, who are mainly using AC learning style, had great scored. Similar with present study which was conducted by Panahi et al(2012), Ahanachian et al (2012) showed that there was no significant relationship between LS and academic achievement (18,19). In contrast, Yang et al (2013) showed that academic achievement of students who were convergers was significantly higher than those who were Divergers/accommodators (19). Yang et al (2012) found that one third of respondents were shown to be convergers in their LS (33.3%). The academic achievement of students who were convergers was significantly higher than those who were learning styles(19). Different researcher have been used to explain academic achievement besides different in ability, which are not easy to control, students have specific LS that may influence their academic achievement (20,21,22,23,24).The few existing studies-the majority from the united states-report significantly increased achievement in the profession when students have studied with strategies congruent to their LS preferences (25,26,27,28,29). Another study which conducted by Salehi (2007) who described that there was no significant relationship between curriculum grade and the accommodator, and diverger style (30). This study result also indicated that the highest mean score of participants, who are mainly using AC learning Style had great scored. The main reason might be: point towards a need to increase the LS preference in their academic study. This was further evidence in the suggestions from participants, considering this achievement of nursing students, it seems necessary to take in to account the qualities education based on their learning style during study. This may students with direction for need of further learning styles. In similar with current study result, Previous studies which conducted by Nilson (2010) who have shown that convergers seem to prefer many types of experiences, practice sessions, investigations, demonstrations, and problem solving (31). This agrees with Malcomn (2009) who showed academic performance privileges for converging and assimilating LSs and he believed that the converger's greatest strength is in the practical application of ideas (32). Similar finding were found by Thain et al. (2011) who suggested that understanding a student's leaning style is helpful in providing a successful learning experience, no matter what teaching method is utilized (33). Another similar ideas by Kazu (2009) who found to facilitate learning we must understand who are students are and their LSs to truly be effective (34). In addition ,a study which conducted by Kavale & Lefever (2007) who described the Dunn model for using instructional strategies that are responsive to students' LS will improve their academic achievement and attitude toward learning (35).The present study also determined a relationship between learning styles and a number of sociodemographic characteristics. Undergraduate nursing students are some of the most studied groups with regard to learning styles and Kolbs LSI is the most frequently used instrument, which determine LS. No study assessing LS of undergraduate nursing has used the most recent version of Kolb LSI

(Version 3.1). But, this instrument was currently used in the United State of America to identify LS of otolargology resident(6).This study indicates that students in this study had mainly AC learning styles. Although female students had a higher AC mean score than male students. However, there was no relationship between LS and Gender. In contrast, D'Amore et al (2012) showed that female students had a higher reflective observation (RO) score than male students (37). This study result also indicated that there was no statistically relationship between learning style and age classification, academic level. However, there was relationship between AC learning style and academic achievement and AE learning style and academic achievement as a component. In similar, Smith (2012) showed that there was no relationship between LS and age, previous employment or nursing experience (38). This is unexpected since it would be anticipated that those with more experience would have more a balanced LS.. In contrast, the study which was conducted by Fleming et al (2011) who found the most common dominant LS in first year was the dual learning category (35%) while a large proportion of the students (53%) in their final year had no dominant LS (39). In contrast, the study was conducted by Erol (2010) in Tukey, who explored the Kolb LSs inventory was used to explore the LS of the study group(40).This is agreed with Aziz et al (2013), who determined Reflector the LS was the most common among the students .The preferred LSs were statistically independent of the demo graphic variables examined such as level of academic years, sex, race and pre-University qualifications (41,42,43). The main reasons might be: the questionnaire used may not be a suitable tool to detect any gender differences in LS or it may not include questions related to the areas of differences. Students who are RO learning style in the previous studies are motivated themselves to discover the relevancy of a environment or situation. They may like to reason from concrete, specific information and to explore what a system has to offer, and they may prefer to have information presented to them in a detailed, systematic, reasoned manner.

5. Conclusion

This is the first study which conducted among undergraduate nursing students' relationship between LS, and their academic achievement in school of nursing and midwifery of TUMS. More research with larger groups is needed to generalize this result. Meanwhile, Practitioners in universities, school of nursing and midwifery, higher education need consideration in identifying the factors that lead to change their LS and academic achievement. In nursing, the rapidly changing health care delivery and practices require sound LS, and decision making skills. Furthermore, it is necessary to provide students with the skills to seek analyze and utilize information effectively. Further research is needed to include variables such as Academic achievement that may influence RO, AE in LS in undergraduate nursing students as suggested by different

previous studies. Educate all students who are attend universities, college and any higher educational level about the main purpose and importance of LS. The study could be replicated in a greater number of nursing and midwifery schools at different Universities and institutions of higher education. Replicating the study with students in other educational disciplines might yield beneficial insight into classroom engagement as well. Persistence between gender groups was another serious issue in this finding that might also be an area of future research. Conduct a study using Kolb's learning style with full permission in place of LS which has been developed for the nursing profession. The main recommendation is to repetition of this study with a larger sample size. Conducting action research that would apply specific techniques to target diverse perspectives, communication with faculty and peers, asking questions in class, class discussions, and perceived difficulty of course work, and preparation for class is recommended.

Authors Contribution

AA has made substantial contributions to beginning and design, collection of data, analysis and interpretation of data and in drafting the manuscripts and correcting the comment given by the advisors. SS and NM involved in revising the research paper and the manuscript critically with important intellectual context; also participated in the approval of the final version to be published in its design and coordination. He participated in the approval and funding process, participated in the design of the study participated in its design and coordination. In addition, all Authors had greater contribution in reviewing the manuscript English and topography and helped to draft the manuscript.

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