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RESEARCH ARTICLE

Problem-Solving and Communication Skills of Undergraduate Nursing Students

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Abstract:

Background:

Problem-solving and effective communication are essential skills for daily nursing duties. Despite several studies highlighting those concepts, few examined the relationship between these concepts among nursing students. This study aimed to investigate undergraduate nursing students' problem-solving and communication skills.

Methods:

A cross-sectional correlational design was used. A sizeable convenient sample of 489 undergraduate nursing students was recruited from six nursing schools in Jordan. Data were collected using an online self-administered survey. The Arabic version of the Problem-Solving Inventory and a translated version of the Communication Skills Attitude Scale were used. Descriptive statistics and multiple linear regression were used to analyze the data.

Results:

The sample included 64.4% females. The mean total score of the problem-solving scale was 96.63 (SD=16.99). Gender, considering self as an initiative person, and negative attitude toward communication were significant negative predictors, while positive attitude toward communication was a positive predictor of nursing students' problem-solving skills.

Implications:

Educational programs that improve nursing students' attitudes toward communication and mental health courses that focus on positive personality traits are needed to improve nursing students' problem-solving skills.

Conclusion:

The results indicated a moderate level of problem-solving skills, a high level of positive attitudes toward communication skills, and a low level of negative attitudes toward communication skills among undergraduate nursing students.

Keywords: Initiative, Communication skills, Nursing students, Problem-solving, Solving, Patients.

1. INTRODUCTION

Nurses work in a highly complex and unpredictable environment, where they face changes in patients' needs and work circumstances. They must retain adequate problem-solving abilities to determine the most suitable resolutions to the stressful situations they experience through their day-to-day work [1, 2]. Problem-solving is a critical part of the nursing daily working duties. When encountering a problem, nurses have to apply their intellectual and cognitive abilities to examine and recognize the situation and construct a proposed solution supported by evidence [3, 4].

Problem-solving proficiency is an intellectual and behavioral process requiring an advanced level of questioning that can help the nurse analyze the situation, suggest the most suitable solution, and apply it to solve the problem [5].

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Therefore, problem-solving abilities are necessary for formatting, performing, and assessing nursing care [6], and this expertise can be boosted by academic education [7]. Education is the continuous development of individual and professional competency that prepares individuals to face daily life needs. This entails that the individuals be inspired and capable of constructing operative resolutions to their problems. Nursing students should learn to appraise the situations they encounter critically and apply nursing knowledge and skills to solve emerging problems effectively [8]. Problem-based learning (PBL) in nursing is a method of learning that enhances nursing students' abilities to utilize nursing theories in clinical practice through active involvement, problem-solving, and critical thinking. It requires nursing learners to use their knowledge and skills in new situations to achieve their goals [9].

Nursing students' acquisition of problem-solving skills is impeded by many factors, such as gender, personality traits, and the opportunities to practice problem-solving skills [10 - 12]. It is essential to exercise problem-solving by gathering information and producing knowledge regarding the problems [4]. Therefore, nursing students must identify the significance of communication skills and obtain sufficient capabilities in communication during their education process [4]. Communication is the process of information generating and exchanging between two or more individuals, which is crucial for nurses to provide high-quality and safe healthcare services to patients. Moreover, communication skills are essential to empower nurses to present their knowledge and exhibit it in practice [13]. Previous studies indicated that good communication skills are linked to nursing students' problem-solving abilities [1, 14].

Studying problem-solving and communication skills among nursing students will provide an attempt to offer a better understanding of both problem-solving abilities and communication skills, which will provide an opportunity to enhance nursing education. Although some studies investigated the relationship between nursing students' communication skills and problem-solving skills, this relationship has not been adequately addressed [14]. Therefore, this study aimed (1) to determine the problem-solving abilities and communication skills of undergraduate nursing students and (2) to identify predictors of the problem-solving skills of undergraduate nursing students.

2. METHODS

2.1. Design

A cross-sectional correlational design was used.

2.2. Sample and Sampling

The target population in this study was undergraduate nursing students enrolled in the nursing program. The number of nursing students in Jordan in 2020 -2021 was 8983 [15]. The sample size was calculated using Raosoft (sample size calculator), with a margin error of 5% and a confidence level of 95%. The minimum required sample size was 368 nursing students. A convenient sampling technique was used to recruit nursing students from six nursing schools in Jordan from April 2021 to September 2021. The inclusion criteria included students enrolled in the nursing program from all academic years.

2.3. Study Procedure

Data were collected using an online self-administered survey. Google forms were used to create the online survey. Target universities' websites and social media groups were used to provide the questionnaire link for the target population. Networking and snowballing techniques were used to include students. Further, the contact details of the researchers were provided to participants in case they had any questions.

2.4. Ethical Considerations

Ethical approval was obtained from the Scientific and Research Committee at the Faculty of Nursing, Al-Ahliyya Amman University. Also, permissions from the tool developers were obtained before data collection started. Students who agreed to participate in the study were asked to check the consent statement before starting the survey. The participation was voluntary, and students were informed that they had the right to withdraw from the study without any consequences.

2.5. Measures

Socio-demographic variables included ten questions about age, gender, marital status, academic year, previous hospital clinical experience for bridging students, initiative, and previous hospital training.

2.5.1. Problem-solving

The Arabic version of the Problem-Solving Inventory (PSI) was used to measure problem-solving skills [16]. It is a Likert-type self-assessment questionnaire consisting of 35 items (3 filler items) measuring the individual's self-perception regarding his/her problem-solving skills. The PSI consists of three subscales: Problem-Solving Confidence (PSC), Approach-Avoidance Style (AAS), and Personal Control (PC). The PSC subscale (11 items) assesses self-confidence and belief in the ability to solve problems effectively (*e.g.*, "I make decisions and I am happy with them later."). The AAS subscale (16 items) assesses approaching versus avoiding problems (*e.g.*, "Even though I work on a problem, sometimes I feel like I am groping or wondering, and I am not getting down to the real issue."). The PC subscale (5 items) assesses the degree of self-control (*e.g.*, "I have a systematic method for comparing alternatives and making decisions."). The PSI is scored using a 6-point Likert scale ranging from strongly agree (1) to strongly disagree (6). The possible PSI score range is from 32 to 192. Low scores on the PSI reflect a positive self-appraisal of problem-solving abilities. The Arabic version showed an excellent internal consistency level of .89 [16].

2.5.2. Communication Skills

The Communication Skills Attitude Scale (CSAS) was used to collect students' attitudes about communication skills learning developed by Rees, Sheard, and Davies [17]. The scale consists of two subscales: The Positive Attitude Scale (PAS) and the Negative Attitude Scale (NAS). Each subscale

has 13 items using a 5-point Likert scale ranging from 'strongly agree' (1) to 'strongly disagree' (5). The possible scores for each subscale range from 13 to 65. Higher scores of the subscale indicate stronger positive or negative attitudes toward communication skills. The English version of the CSAS was translated into Arabic by two independent bilingual nursing professors. Both professors were fluent in both Arabic and English. Then, the CSAS was back-translated into English by another professor specializing in translation. The translated version was evaluated by four nursing experts who have experience in tool translation and validation. The goal of the translation process was to produce an Arabic version of the CSAS with items that were equivalent in meaning to the original English version [18].

2.6. Data Analysis

Statistical Package for Social Science (SPSS) version 21 was used to analyze the data [19]. Descriptive statistics, including percentages, mean, and standard deviation, were calculated to describe demographics, including age, gender, marital status, and other defining characteristics of the students. In addition, range, mean and standard deviation were calculated for the PSI and its three subscales, the PAS and the NAS subscales. Two-step multiple linear regression was used to identify predictors of problem-solving skills. All assumptions of this analysis were met, and multicollinearity was tested. Alpha level was set at 0.05.

3. RESULTS

3.1. Sample Characteristics

A total sample of 489 nursing students participated in the study. The students' average age was 22 years (SD=3.76) and ranged from 18 to 43. The sample included 64.4% females.

Most of the sample (83.6%) considered themselves initiative persons. Of the study sample, 71.6% received training in a hospital see Table **1**.

3.2. Problem Solving and Communication Skills

The mean score for the problem-solving scale was 96.63 (SD=16.99). PSC subscale mean score was 31.87 (SD=9.54), the PC subscale mean score was 17.21 (SD=3.66), and the AAS subscale mean score was 47.54 (SD=8.98). The PAS subscale mean score was 50.71 (SD=11.49), and the NAS subscale mean score was 35.06 (SD=9.26) (Table **2**).

3.3. Predictors of Nursing Students' Problem-Solving Skills

Two-step multiple hierarchal linear regression was generated to assess predictors of nursing students' problem-solving skills, controlling for selected demographics (Table **3**). The analysis showed that model 1, which included age, gender, and marital status as covariates, was significant (F = 4.36, p = 0.005) and explained 2% (R^2 = .020) of the variance in problem-solving skills. In this model, gender was a significant negative predictor (p =.018), meaning male nursing students are expected to have significantly less problem-solving skills than female nursing students. In model 2, the covariates (academic year, previous clinical experience in hospitals, considering yourself an initiative person, previous training in the hospital during the nursing study, PAS, and NAS) were entered into the model. With these covariates, the model remained significant (F = 47.934, p < .001). The model explained 46.4% (R^2 = .464) of the variance in problem-solving skills. In the second model, considering yourself an initiative person and PAS were significant negative predictors, while NAS positively predicted nursing students' problem-solving skills. The effect of gender in the second model attenuated and became insignificant.

Table 1. Descriptive characteristics of the study sample (N=489).

Variable	N (%)
Gender	-
Male	173 (35.4)
Female	316 (64.4)
Marital Status	-
Single	426 (87.1)
Married	58(11.9)
Divorced	5(1.0)
Academic Year	-
First-year	99(20.2)
Second-year	103(21.1)
Third-year	160(32.7)
Fourth-year	127(26)
Do you have previous clinical experience in hospitals before you study baccalaureate nursing	-
Yes	177(36.2)
No	312(63.8)
Do you consider yourself "An initiative person"	-
Yes	409(83.6)
No	17(3.5)
May be	63(12.9)

(Table 1) contd.....

Variable	N (%)
During your nursing study, have you ever trained in a hospital?	-
Yes	350(71.6)
No	139(28.4)
Variable	**M (SD)**
Age	22(3.76)
Number of passed credit hours	73.48(39.14)

Table 2. Description of Problem-Solving and Communication Skills among Undergraduate Nursing Students (N=489).

-	Actual Range	Mean (SD)
PSI total score	48-150	96.63(16.99)
PSC	11-56	31.87(9.54)
PC	8-26	17.21(3.66)
AAS	24-74	47.54(8.98)
PAS	17-65	50.71(11.49)
NAS	16-61	35.06(9.26)

Table 3. Predictors of problem-solving skills of undergraduate nursing students (N=489).

-	Model 1				-	Model 2			
Model	B	SE	Beta	P	-	B	SE	Beta	P
Age	-.301	.241	-.067	.212	Age	-.026	.203	-.006	.900
Gender	-3.841	1.615	-.108	.018	Gender	.783	1.244	.022	.529
Marital status	-3.025	2.433	-.067	.214	Marital status	-1.217	1.836	-.027	.508
-	-	-	-	-	Academic year	.116	.666	.007	.862
-	-	-	-	-	previous clinical experience in hospitals	.378	1.244	.011	.761
-	-	-	-	-	considering yourself an initiative person	-1.724	.853	-.069	.044
-	-	-	-	-	previous training in the hospital during the nursing study	-.083	1.481	-.002	.955
-	-	-	-	-	PAS	-.813	.050	-.550	< .001
-	-	-	-	-	NAS	.612	.063	.333	< .001

4. DISCUSSION

This study investigated predictors of problem-solving skills of undergraduate nursing students. A cross-sectional correlational design was used on a large convenient sample of 489 undergraduate nursing students from six nursing schools in Jordan. The results showed that nursing students have a moderate level of problem-solving skills. They reported high positive and low negative attitudes toward communication skills. Male nursing students and students with negative attitudes toward communication skills have significantly lower problem-solving skills. Nursing students who consider themselves initiative and who have positive attitudes toward communication skills have significantly higher problem-solving skills.

The levels of problem-solving skills in this study were consistent with prior studies in Turkey [4, 20]. Another study conducted in Korea and included a convenience sample of 161 nursing students found that the total mean score for PSI was 119.23. Compared to the current study, nursing students in Jordan reported higher problem-solving skills [21]. A study conducted in Turkey examined the critical thinking and problem-solving skills of 93 nursing students. The study found that the mean total score of PSI was 87.55(SD=2.65) and

86.32(SD=2.50) in two groups of nursing students [22]. In addition, a study conducted in Iran that included 322 undergraduate nursing students found that the mean score of PSI was 89.52 (SD=21.58) [23]. Compared to the current study, nursing students in Jordan reported lower problem-solving skills.

Nursing students in the current study reported high positive and low negative attitudes toward communication skills. Another study was conducted in Turkey included 170 nurses and 413 students studying at the nursing school. The study found that both groups had moderately good communication [24]. Another study conducted with 246 nursing students in Turkey found that nursing students reported moderate communication skills of 77.325(SD=11.33) [4]. A Finnish study was conducted to examine the effect of a pilot communication skills course on second-year medical students. Using the same tool as in this study, Koponen, Pyörälä & Isotalus [25] found that the median PAS and NAS scores before the course were 45 and 31, respectively. In another study in Spain, PAS and NAS mean scores were examined in a group of first-year medical and nursing students. The results showed that PAS and NAS mean scores were 51.43 and 23.05, respectively [26]. Compared to these results, nursing students in the current study had a comparable PAS mean score;

however, these students had higher negative attitudes toward communication skills.

The female gender predicted better problem-solving skills than the male gender. On the contrary, Koc *et al*. [20] found that the problem-solving skills of male students were higher than those of female students, while no significant differences were found based on gender in other studies [4, 21, 23]. The finding that female students showed better problem-solving skills might be explained in a cultural context as women in the Arab culture face several challenges in the workplace. Despite the higher enrollment rates of females in Jordanian universities, the male-dominant community demands females to make further efforts in their tasks to prove themselves [27, 28]. Nursing students who considered themselves to be initiative reported better problem-solving skills as being initiative is a personality trait that facilitates creative problem-solving [29]. In this study, positive attitudes toward communication predicted higher problem-solving abilities, while negative attitudes toward communication predicted lower problem-solving abilities of nursing students. Kim and Sim [1] found that communication skills significantly affected problem-solving skills among clinical nurses. In addition, communication skills enhance nurses' understanding of patients' conditions and their perception of professionalism. Another study that included undergraduate nursing students also found that good communication skills improve students' problem-solving abilities [14].

4.1. Study Limitations

This study is not without limitations. First, the instruments used in this study were online self-administered questionnaires. Second, the cross-sectional design limited the investigation of causal relationships between study variables. Further research studies are needed to understand better how nursing students improve their problem-solving skills.

4.2. Implications

Several studies examined undergraduate nursing students' problem-solving and communication skills, but few were in Jordan. This was one of the very few studies that examined important concepts for nursing practice in Jordan. Developing communication and problem-solving skills in nursing students is an investment for the profession's future. The findings indicated the need for developing educational programs that improve nursing students' attitudes toward communication. In addition, the study showed an essential effect of a personality trait on problem-solving skills among nursing students. Implementing mental health courses that focus on positive personality traits is one of the approaches that can enhance nursing students' problem-solving skills.

CONCLUSION

The results indicated a moderate level of problem-solving skills, a high level of positive attitudes toward communication skills, and a low level of negative attitudes toward communication skills. Male gender and having higher negative attitudes toward communication skills were significant predictors of lower problem-solving skills while being an initiative having positive attitudes toward communication skills were significant predictors of higher problem-solving skills.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The ethical approval was obtained from the Scientific and Research Committee at the Faculty of Nursing, Al-Ahliyya Amman University.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The details are available within the article.

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CONFLICT OF INTEREST

The authors declare no conflict of interest financial or otherwise.

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