

Talented and Gifted Mentors for the Promotion of Motivation, Educational, and Research Activities of Nursing Students

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Abstract

Background: Having a mentor affects nursing students' academic achievement and motivation.

Objectives: This study aimed to investigate the effects of the mentoring program delivered by talented and gifted postgraduate students on motivation, academic achievement, and research activities of undergraduate nursing students of Kashan University of Medical Sciences in 2020.

Methods: In this formal mentoring program designed as quasi-experimental pre-post-test design research, 29 out of 37 eligible undergraduate nursing students with a low-grade point average (GPA) enrolled voluntarily. After completing the Science Motivation Questionnaire (SMQ), 21 students with low or moderate motivation entered the study as part of either mentee (n=10) or the control group (n=11). Five talented master's degree students were selected as mentors, each joining with two mentees and leading them through specific programs during one semester. At the beginning and end of the semester, students' academic motivation, the number of research activities, and educational performance were evaluated and analyzed by covariance (ANCOVA) and paired t-tests.

Results: The students in the mentee group had higher academic motivation than the control group (P = 0.05); 80% of mentees had more than one research activity, while the controls had no research activities (P<0.001), and there was no significant difference between the two groups in the Grade Point Average (GPA) (P=0.110).

Conclusion: Talented students could play the role of mentors well, and applying a mentoring program enhanced undergraduate nursing students' academic motivation and research activities and prevented a decline in their GPAs.

Keywords: Nursing Students, Mentoring, Motivation, Academic Achievement, Research

Background

Nurses play a critical role in the health system (1). To train capable nurses, students must have the necessary ability in education, research and communication skills. Individual and environmental factors affect students' academic achievement, including age, gender, ethnicity, personality traits, academic motivation, curricula, and academic climate (2). The results of surveys in this field indicate that many nursing students have the low academic motivation and are anxious at the beginning of the clerkship period (3, 4).

One of the factors affecting academic motivation is having a mentor. Mentoring is an effective teaching method to minimize students' anxiety, promote their active learning, create responsibility, and improve their self-confidence. Mentors can provide emotional, professional, and research support and have professional experience and network connections (3).

In most studies conducted in nursing mentoring, undergraduate nursing students of higher academic rank have been selected as mentors. In these studies, only the educational and psychological goals were

considered as outcomes (4, 5). Talented and gifted master's degree students, who had successfully obtained their bachelor's degree and were studying at a higher education level with sufficient motivation and high educational performance, can be suitable candidates for mentorship. In a literature review, no study was found about the implementation of the mentoring program by talented mentors and the impact of the mentoring program on the research activities of nursing students.

Based on the nursing curriculum in Iran, special courses (including internal surgery, mothers, infants and children, and research methodology) are offered in the 3rd and 4th semesters. According to the available evidence (executive experience, review of SAMA educational software, and literature review), many students suffer from anxiety and academic failure in these semesters (6, 7).

Objectives

The present study aimed to investigate the effects of a mentoring program delivered by talented and gifted postgraduate students on research activities, motivation, and academic achievements of undergraduate nursing students in the 3rd and 4th semesters at Kashan University of Medical Sciences (KAUMS) in 2020.

Methods

The present study was a quasi-experimental research (a pretest-posttest control group). It was conducted at Kashan University of Medical Sciences and Health Services in the first semester of the 2019-2020 academic year.

Mentor selection: For the selection of the mentors, 19 master's degree students were identified as gifted and talented students and had at least one ongoing research project and one published article according to the official regulations (8). The executors held a meeting to explain the goals and benefits of participating in this project. Ten of them expressed their interest in participating in the study. The executors also interviewed them for other inclusion criteria such as high academic motivation, critical thinking, patience, interest in the teaching-learning process, responsibility, and being an active listener. Finally, five students were selected and entered the study as mentors.

Mentee candidates selection: 3rd or 4th-semester nursing students with a total Grade Point Average (GPA) of less than 17 were identified (through SAMA educational software) and selected as mentees or the control groups. A briefing session was held explaining the goals and method of study. Of 37 eligible individuals, 29 students consented to participate and completed the Science Motivation Questionnaire (SMQ) (7). Of the

students with low or moderate academic motivation scores, 21 were selected to participate in the study. (Figure 1)

Mentor-mentee and control group formation: A researcher-made form was provided for a better match between the mentee and mentor. Demographic information and preferences were obtained regarding sex, religion, cultural status, place of residence, how to meet and the number of hours of contact with the other partner, and the mentor's field of study (the last item was only for mentees). Then, based on those data, out of 21 mentee candidates, two were assigned to each mentor. The remaining 11 subjects were assigned to the control group. For internal validity and to avoid compensatory competition, the control group was promised they would have a mentor next semester. The student's reluctance to continue participating in the study or mentor-mentee sessions was considered an exclusion criterion.

Intervention: Before the commencement of the semester, two sessions were held to explain the mentees' and mentors' rights and duties. Also, the participants were given an educational pamphlet and a podcast about the interactive methods, effective communication, anger management, and mutual respect. The groups were asked to focus on increasing their motivation and grade point averages, improving practical skills, and conducting research activities for the mentees. At the beginning of the semester, mentees and mentors communicated through various methods (virtual or face-to-face). Mentors guided mentees in study planning, proper studying methods and the importance of lessons, relevant educational resources, and solving sample test questions. Mentors tried to reduce mentees' anxiety in clinical settings in various ways, including saying soothing sentences, teaching procedures in the skill lab, and accompanying mentees in the first few days of hospital stay in performing procedures. In addition, the mentors taught their research knowledge to the mentees, encouraged them to participate in the research workshops, involved them in research projects, and taught them how to perform research projects from proposal writing to article submission. Each mentor-mentee group had to submit a monthly performance report form.

The supervision of the mentee mentor groups was done by the University Talented Office and a medical education specialist. The executors tried to identify and address the program's shortcomings through telephone follow-up monitoring of the groups. The mentor-mentee performance report form was checked monthly,

and appropriate feedback was given to them by the medical education specialist.

In the control group, students studied according to the routine faculty program.

Assessments: The expected outcomes of the mentoring program included students' academic motivation, academic achievement, and research activities, which were assessed in a pretest-posttest format.

The Science Motivation Questionnaire II (SMQ II), developed by Shawn M. Glynn in 2011, was used to assess students' academic motivation. The questionnaire has 25 questions and includes five subscales of motivation: intrinsic motivation, self-determination, self-efficacy, career motivation, and grade motivation. Each component is measured with 5 separate items.

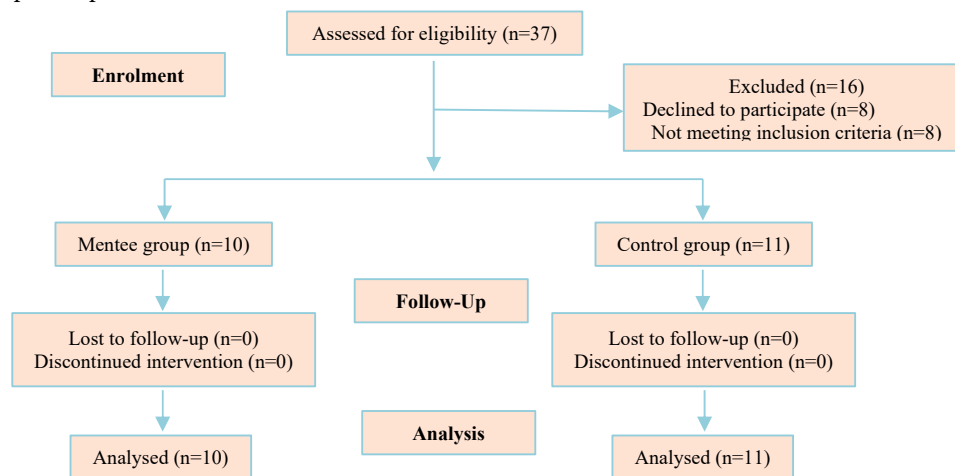


Figure 1. Consort diagram

In this questionnaire, the subject responds on a 5-point Likert scale (from 0: never to 4: always). The obtained scores range from 0 to 100 (above 85: high academic motivation, 50-85: moderate academic motivation, and below 50: low academic motivation) (9). In a study carried out at Shiraz University, the content validity of this questionnaire was confirmed using factor analysis (76.69% variance), and Cronbach's alpha coefficient was estimated to be 0.97 for the whole questionnaire and ranged from 0.90 to 0.93 for each subscale, indicating its acceptable reliability (6).

The GPA of the students in the same academic semester, which demonstrated their knowledge in theoretical and their skills in practical courses, was considered to evaluate academic achievement. GPAs were extracted through the SAMA educational system.

The database of the Vice Chancellor for Technology Research was used for measuring students' research activities. The number of cases of participation or lectures in research workshops, number of approved research proposals, conference abstract presentations, or published articles of students were extracted.

At the end of the study, the mentors and mentees were questioned with three open-ended questions about the program's strengths and weaknesses and their suggestions.

The follow-up of the groups after half a year of study was impossible because the mentoring program was

welcomed by the nursing faculty officials and was widely implemented in the faculty with the help of the Talented Office.

Data Analysis: The SPSS 24 software was applied for data analysis. Due to the normal distribution of motivation and GPA based on the Shapiro-Wilk test and the Q-Q plot, parametric statistical tests were used. Measures of central tendency and dispersion for quantitative variables, and absolute and relative frequencies for classified variables were used. Since the present study was a pretest-posttest control group one, analysis of covariance (pre-test variable as a covariate) and paired t-test were used. In addition, Fisher's exact test was applied to assess the effect of mentoring programs on the number of the students' research activities.

Results

In the present study, 21 undergraduate nursing students, (10 persons in the mentee group (8 females) and 11 persons in the control group (4 females)) participated, and no significant gender differences were observed between the two groups ($p = 0.115$).

After the implementation of the mentoring program, the findings indicated that the average score of academic motivation obtained for the mentee group (84.10 ± 80.30) was significantly higher than the same value in the control group (75.45 ± 11.44) ($p = 0.05$), indicating

that mentoring program had significantly influenced the students' academic motivation. Also, among the motivation components, only career motivation in the mentee group had a significant increase compared to the controls ($p=0.018$) (Table 1).

At the end of the semester, no significant difference was observed between the mentee (15.2 ± 22.02) and control (13.59 ± 1.48) groups in the mean score of educational performance (the GPA) ($p = 0.110$), indicating that the mentoring program did not significantly affect students' educational performance (Table 2).

Regarding research activities, none of the subjects had any research activity in the pre-test. In the post-test, in the mentee group, 80% of the students had more than one research activity, while the same value was zero in the control group ($p < 0.001$), indicating that the mentoring program had a significant effect on the student's research activities (Table 3).

The results of the surveys showed that the mentees were satisfied with the program and an effective communication was established between them and the mentors, and they were willing to continue this program.

Table 1. Investigating the effect of mentoring program implementation on academic motivation

Variable	Time	Group		p-value*	Effect size(η^2)
		Mentee (Mean \pm SD)	Control (Mean \pm SD)		
Intrinsic motivation	Pre-test	13.70 \pm 1.64	11.18 \pm 1.78	0.219	0.083
	Post-test	15.9 \pm 2.33	12.00 \pm 2.49		
	Mean Difference (95%CI)	2.20 (1.32-3.08)	0.82 (-0.26-1.89)		
	p-value**	<0.001	0.121		
Self-determination	Pre-test	15.40 \pm 1.78	15.45 \pm 2.81	0.134	0.120
	Post-test	16.80 \pm 2.39	15.82 \pm 3.22		
	Mean Difference (95%CI)	1.40 (-0.08-2.88)	0.27 (-0.40-0.95)		
	p-value**	0.061	0.391		
Self-efficacy	Pre-test	15.70 \pm 1.57	15.00 \pm 2.97	0.140	0.117
	Post-test	17.60 \pm 1.95	16.00 \pm 3.03		
	Mean Difference (95%CI)	1.90 (1.11-2.69)	1 (-0.08-2.08)		
	p-value**	<0.001	0.067		
Career motivation	Pre-test	16.80 \pm 2.25	18.45 \pm 1.69	0.018	0.274
	Post-test	18.20 \pm 1.99	18.18 \pm 1.94		
	Mean Difference (95%CI)	1.40 (0.49-2.30)	-0.27 (-0.95-0.40)		
	p-value**	0.007	0.391		
Grade motivation	Pre-test	14.50 \pm 1.43	11.91 \pm 1.22	0.675	0.010
	Post-test	16.30 \pm 2.41	13.45 \pm 2.07		
	Mean Difference (95%CI)	1.80 (0.64-2.96)	1.54 (0.58-2.51)		
	p-value**	0.007	0.005		
Academic motivation (Total score)	Pre-test	76.10 \pm 7.62	72.09 \pm 9.62	0.050	0.197
	Post-test	84.80 \pm 10.30	75.45 \pm 11.44		
	Mean Difference (95%CI)	8.70 (4.82-12.57)	3.36 (0.082-6.64)		
	p-value**	0.001	0.045		

*ANCOVA, **Paired t-test

The mentors criticized the program on some issues, such as the lack of attendance of some mentees in the online or face- to-face meetings, and their own lack of knowledge in answering some of the mentees' questions. The mentors suggested participating in workshops on the future of the field, especially on the topic of continuing education in postgraduate studies, and launching student publications to promote the research motivations of undergraduate students.

Discussion

The present study aimed to determine the effects of mentoring programs on motivation, academic achievement, and research activities of undergraduate

nursing students of KAUMS. Academic achievement is one of the most important measures applied to assess students' ability to complete university education, reach the final stage of graduation, and predict their future status in terms of necessary qualifications and scientific and practical skills. Today, many nursing students have insufficient academic achievements and are not interested in improving their scientific level (3). Their demotivation and low scientific level can adversely influence the community's health (1). Demotivation can lead to emotional and behavioral problems, and thereby pessimism, anxiety, depression, mental disorders, and dramatic decline in personal, academic, social, and occupational performance (10).

In the present study, talented and gifted master's degree nursing students, who had successfully obtained their bachelor's degree and were studying at a higher education level with sufficient motivation and high educational performance, were tasked to guide, counsel, and be role models for undergraduate nursing students who were demotivated and had a poor academic performance. In contrast, in previous studies in the field of nursing mentoring, undergraduate nursing students (students of the same or higher semester) were selected

as peer mentors and often guided mentees only in clinical courses (3-5).

Despite the established importance of mentorship, mentoring relationships can be challenging to develop and sustain. Cultural differences, differences in communication styles, implicit bias, and assumptions about others may act as barriers or adversely affect mentoring relationships (2).

Table 2. The effect of mentoring program implementation on students on educational performance

Variable	Time	Group		p- value*	Effect size(η^2)
		Mentee (Mean \pm SD)	Control (Mean \pm SD)		
Grade Point Average (GPA)	Pre-test	15.53 \pm 1.24	14.79 \pm 1.44	0.110	0.136
	Post-test	15.22 \pm 2.02	13.59 \pm 1.48		
	Mean Difference (95%CI)	-0.31 (-1.33-0.70)	-1.20 (-1.79--0.62)		
	p-value**	0.506	0.001		

*ANCOVA, **Paired t-test

Table 3. Investigating the effect of mentoring program on the number of students' research activities

Variable	Group	Mentee N(%)	Control N(%)	p-value*
Number of research activities in the post-test	0	0	2 (18.2)	<0.001
	1	2 (20)	9 (81.8)	
	>1	8 (80)	0	

*Fisher's exact test

In this study, to improve the quality of mentor-mentee relationships, various criteria were considered in selecting the mentors, including being a talented and gifted student, availability, persistence, interest in teaching, and diverse social relations. In addition, for matching the mentees with the mentors, the personal matching method was used based on similarity in gender, residence, culture, age, and field of interest (7).

In this study, initial briefing sessions were held before the intervention, and the program's goals were explained. Various interactive methods, effective communication, anger management, and mutual respect were also taught to determine appropriate expectations between the mentor and the mentee. Manuel's article in 2021 outlines the key to the success of mentoring training programs: training mentees to explain their needs to mentors, assisting mentors to perform their duties, being loyal and appreciative, asking for feedback, and creating a mentorship network (10).

Mentoring program significantly influenced the students' academic motivation after one semester. Numerous factors influence the motivation of nursing students during their study period. Socio-cultural issues

related to this field (reduced level of dignity and the society's lack of right understanding of the field of nursing), relevant educational issues (high volume training and difficulty of courses, gap between theory and practice in nursing, lack of interest in some courses), compatibility of student personality with this field, faculty management, students' living conditions, work experiences in hospital wards, doctors' dominance over nurses, the possibility of getting sick, experiencing patients' problems in the workplace, and being away from family can reduce the motivation of nursing student (6). Doing research along with educational activities and having a mentor are mentioned as factors playing an influential role in enhancing undergraduate nursing students' motivation (2). In the present study, the mentee group students showed higher motivation than the control group. Considering the relative stability of educational, cultural, etc., conditions of students in the two mentorship and control groups, it may be concluded that in the mentorship group, the presence of motivated mentors can be considered as the reason for the enhanced motivation of the low-motivated nursing undergraduate students. The results of O'Keefe's study confirm this conclusion (11).

After implementing the mentoring program during one semester in this study, students' GPA did not change significantly in the mentee group. This result is inconsistent with Nora et al.'s study on 200 students, who indicated that students' knowledge and educational performance enhanced after implementing a mentoring program for two years. This inconsistency can be attributed to the difference between the present study and their study's duration of intervention and

monitoring (six months vs. two years) (12). Based on the nursing curriculum, the third and fourth semesters are the beginning of the clerkship period, and the exams are both written and practical. In multiple studies, GPA was used as the performance assessment criteria in educational interventions (13). Therefore, it can be asserted that students' GPA score demonstrates their knowledge in theoretical courses and their skills in practical ones. In the present study, the scores of theoretical and practical exams were not extracted separately. Therefore, it cannot be clarified that the lack of GPA improvement in the mentee group was caused by which category of courses.

The research activities of undergraduate students were also considered in this study. At the end of the study, the mentee group had significantly higher research activities (including frequency of attendance or number of lectures in research method workshops, number of approved proposals, number of articles and abstracts submitted or being published) compared to the control group. In other words, the mentoring program significantly affected students' research activities. According to a literature review, there is no study evaluating the effect of the mentoring program in research in nursing education (4, 5). Daneshmandi (2017) and Mitchell (2009) have achieved similar results in their studies on faculty and teachers. According to them, the mentoring program promotes research activities and helps to build groups to carry out research activities, including writing research projects and activities, attendance in conferences and seminars, and participating in research projects and similar activities (14, 15).

Conclusion

Talented and gifted master's degree nursing students in the role of mentors can promote academic motivation, prevent academic failure, and improve the research status of undergraduate nursing students.

It is recommended that the mentorship program be continued for a longer period to allow a better assessment of its impacts on academic achievement. Due to the COVID-19 epidemic and the development of e-learning, implementing a virtual mentoring program is recommended. Evaluation of the motivation and academic achievement and research activities of the mentors also is recommended.

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Ethical approval: The study was approved by the Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (ethical code: IR.KAUMS.MEDNT.REC.1397.107).

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