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THE RELATIONSHIP BETWEEN PROFESSIONAL SPECIALIZATION AND EDUCATIONAL ACHIEVEMENT AMONG NURSING, SURGERY, AND ANESTHESIA STUDENTS IN SAUDI ARABIA

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Abstract

This study investigates the relationship between professional specialization and educational achievement among nursing, surgery, and anesthesia students in Saudi Arabia. A cross-sectional survey design was employed, and data were collected from a sample of 437 students enrolled in nursing, surgery, and anesthesia programs at various universities in Saudi Arabia. The study aimed to determine if there were significant differences in educational achievement across the three specializations and to identify the factors contributing to these differences. One-way ANOVA and multiple linear regression analyses were conducted to examine the differences in educational achievement and determine the predictive effects of professional specialization on educational achievement, while controlling for demographic variables. The findings revealed significant differences in educational achievement across the three specializations, with nursing students outperforming their peers in surgery and anesthesia. The regression analysis confirmed the significant predictive effect of professional specialization on educational achievement, even after controlling for demographic variables. The study highlights the importance of considering the unique characteristics and demands of each specialization when developing strategies to enhance educational achievement among healthcare students in Saudi Arabia. Universities should tailor their support and interventions to address the specific needs and challenges faced by students in different healthcare specializations.

Introduction

Healthcare education is a critical component of the healthcare system, as it prepares future healthcare professionals to provide high-quality care to patients. In Saudi Arabia, there has been a growing demand for skilled healthcare professionals, particularly in nursing, surgery, and anesthesia (Almalki et al., 2011). To meet this demand, universities have expanded their healthcare education programs, offering specialized training in various healthcare fields

(Aldossary et al., 2008). However, despite the increasing enrollment in healthcare education programs, there is limited research on the factors influencing educational achievement among healthcare students in Saudi Arabia (Aljohani et al., 2020).

Professional specialization is one of the factors that may influence educational achievement among healthcare students. Each healthcare specialization has its unique characteristics, demands, and challenges, which may impact students' learning experiences and outcomes (Aljohani et al., 2020). For example, nursing students may face different challenges compared to surgery or anesthesia students, such as the need to develop a broad range of clinical skills and the ability to provide holistic care to patients (Almalki et al., 2011). Similarly, surgery and anesthesia students may face unique challenges related to the technical and procedural aspects of their specializations (Aldossary et al., 2008).

The purpose of this study is to investigate the relationship between professional specialization and educational achievement among nursing, surgery, and anesthesia students in Saudi Arabia. The study aims to determine if there are significant differences in educational achievement across the three specializations and to identify the factors contributing to these differences. The findings of this study may have important implications for healthcare education in Saudi Arabia, as they may inform the development of strategies to enhance educational achievement among healthcare students and improve the quality of healthcare education.

Literature Review

Educational achievement among healthcare students has been a topic of interest for researchers in various countries, including Saudi Arabia. Several studies have investigated the factors influencing educational achievement among healthcare students, including demographic variables, learning styles, and academic motivation (Aljohani et al., 2020; Almalki et al., 2011; Aldossary et al., 2008). However, there is limited research on the impact of professional specialization on educational achievement among healthcare students in Saudi Arabia.

Studies conducted in other countries have found significant differences in educational achievement across healthcare specializations. For example, a study conducted in the United States found that nursing students had higher GPAs compared to students in other healthcare specializations, such as pharmacy and physical therapy (Weil et al., 2017). Similarly, a study conducted in Australia found that medical students had higher academic performance compared to nursing and allied health students (Mills et al., 2016). These studies suggest that professional specialization may have an impact on educational achievement among healthcare students.

Several factors may contribute to the differences in educational achievement across healthcare specializations. One of the factors is the unique characteristics and demands of each specialization. For example, nursing students may need to develop a broad range of clinical skills and the ability to provide holistic care to patients, which may require different learning strategies compared to surgery or anesthesia students (Almalki et al., 2011). Similarly, surgery and anesthesia students may need to focus on developing technical and procedural skills, which may require different learning approaches compared to nursing students (Aldossary et al., 2008).

Another factor that may contribute to the differences in educational achievement across healthcare specializations is the learning environment. Each specialization may have its unique learning environment, including the availability of resources, the quality of teaching, and the level of support provided to students (Aljohani et al., 2020). For example, nursing students may have access to simulation labs and clinical placements, which may enhance their learning experiences and outcomes (Almalki et al., 2011). Similarly, surgery and anesthesia students may have access to advanced technology and equipment, which may facilitate their learning and skill development (Aldossary et al., 2008).

The academic motivation of students may also play a role in the differences in educational achievement across healthcare specializations. Studies have found that students who are intrinsically motivated and have a strong interest in their chosen specialization tend to have higher academic performance compared to students who are extrinsically motivated or have a low interest in their specialization (Aljohani et al., 2020). For example, nursing students who are passionate about caring for patients and have a strong desire to make a difference in their lives may have higher academic motivation compared to students who choose nursing as a second option or for extrinsic reasons, such as job security or high salaries (Almalki et al., 2011).

Despite the potential impact of professional specialization on educational achievement among healthcare students, there is limited research on this topic in Saudi Arabia. Most of the studies conducted in Saudi Arabia have focused on the factors influencing academic performance among medical students (Aljohani et al., 2020). There is a need for more research on the impact of professional specialization on educational achievement among healthcare students in Saudi Arabia, particularly in nursing, surgery, and anesthesia, which are critical specializations in the healthcare system.

Methodology

Research Design

This study employed a cross-sectional survey design to investigate the relationship between professional specialization and educational achievement among nursing, surgery, and anesthesia students in Saudi Arabia. Cross-sectional surveys are useful for collecting data on a large sample at a single point in time and for examining the relationships between variables (Creswell & Creswell, 2018). In this study, data were collected from a sample of nursing, surgery, and anesthesia students enrolled in various universities in Saudi Arabia using an online survey.

Sample and Sampling Technique

The target population for this study was nursing, surgery, and anesthesia students enrolled in universities in Saudi Arabia. A convenience sampling technique was used to recruit participants for the study. Convenience sampling is a non-probability sampling technique that involves recruiting participants who are easily accessible and willing to participate in the study (Etikan et al., 2016). In this study, the researchers contacted the administrators of nursing, surgery, and anesthesia programs in various universities in Saudi Arabia and requested their assistance in distributing the survey to their students. The administrators were provided with a link to the

online survey and were asked to share it with their students via email or other communication channels.

The sample size for this study was determined using G*Power software (Faul et al., 2009). Assuming a medium effect size (f = 0.25), an alpha level of 0.05, and a power of 0.80, the minimum sample size required for a one-way ANOVA with three groups was 159 participants. However, to ensure adequate representation of each specialization and to account for potential dropouts, the researchers aimed to recruit a larger sample of 450 participants, with 150 participants from each specialization.

Data Collection

Data were collected using an online survey that was developed by the researchers based on a review of the literature and consultation with experts in healthcare education. The survey consisted of two sections: (1) demographic information and (2) educational achievement. The demographic section included questions about the participants' age, gender, specialization, year of study, and university. The educational achievement section included questions about the participants' GPA, academic awards, and other indicators of academic success.

The survey was piloted with a sample of 30 healthcare students to assess its clarity, relevance, and ease of completion. Based on the feedback received from the pilot study, minor revisionswere made to the survey to improve its clarity and relevance.

The survey was administered online using Google Forms. The link to the survey was distributed to the participants via email or other communication channels by the administrators of nursing, surgery, and anesthesia programs in various universities in Saudi Arabia. The participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. They were also provided with instructions on how to complete the survey and were given the opportunity to ask questions or raise concerns.

Data Analysis

The data collected from the survey were analyzed using IBM SPSS Statistics version 26. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic characteristics of the participants and their educational achievement. One-way ANOVA was used to examine the differences in educational achievement (GPA) across the three specializations (nursing, surgery, and anesthesia). Scheffe's post hoc test was used to identify the specific groups that differed significantly from each other.

Multiple linear regression analysis was used to determine the predictive effects of professional specialization on educational achievement, while controlling for demographic variables (age, gender, year of study, and university). The assumptions of linear regression, including linearity, homoscedasticity, and normality of residuals, were checked before conducting the analysis. The significance level for all analyses was set at 0.05.

Results

Demographic Characteristics

A total of 437 healthcare students participated in the study, representing a response rate of 97.1%. The majority of the participants were female (69.8%), and the mean age was 21.5 years (SD = 1.8). The distribution of participants across the three specializations was relatively even, with 148 nursing students (33.9%), 141 surgery students (32.3%), and 148 anesthesia students (33.9%). The participants were enrolled in various universities across Saudi Arabia, with the majority (61.3%) being in their third or fourth year of study. Table 1 presents the demographic characteristics of the participants.

Table 1
Demographic Characteristics of the Participants (N = 437)

Characteristic	**n**	**%**
Gender		
Male	132	30.2
Female	305	69.8
Specialization		
Nursing	148	33.9
Surgery	141	32.3
Anesthesia	148	33.9
Year of Study		
First	28	6.4
Second	141	32.3
Third	150	34.3

Characteristic	n	%
Fourth	118	27.0
University		
King Saud University	112	25.6
King Abdulaziz University	98	22.4
Imam Abdulrahman Bin Faisal University	74	16.9
King Khalid University	64	14.6
Qassim University	89	20.4

Educational Achievement

The mean GPA of the participants was 3.72 (SD = 0.46), with a range of 2.30 to 4.95. Nursing students had the highest mean GPA (M = 3.88, SD = 0.42), followed by surgery students (M = 3.69, SD = 0.44) and anesthesia students (M = 3.59, SD = 0.49). One-way ANOVA revealed a significant difference in GPA across the three specializations, $F(2, 434) = 14.83$, $p < .001$. Scheffe's post hoc test indicated that nursing students had significantly higher GPAs compared to surgery students ($p = .003$) and anesthesia students ($p < .001$), but there was no significant difference between surgery and anesthesia students ($p = .176$).

Table 2 presents the means and standard deviations of GPA by specialization, along with the results of the one-way ANOVA and Scheffe's post hoc test.

Table 2
Means and Standard Deviations of GPA by Specialization (N = 437)

Specialization	n	M	SD	F(2, 434)	p
Nursing	148	3.88	0.42	14.83	<.001
Surgery	141	3.69	0.44		

Specialization	n	M	SD	F(2, 434)	p
Anesthesia	148	3.59	0.49		

Note. Means with different subscripts differ significantly at $p < .05$ based on Scheffe's post hoc test.

Predictive Effects of Professional Specialization on Educational Achievement

Multiple linear regression analysis was conducted to determine the predictive effects of professional specialization on educational achievement (GPA), while controlling for demographic variables (age, gender, year of study, and university). The assumptions of linear regression were met, with no evidence of multicollinearity (variance inflation factors < 2.5), linearity (scatterplots showed linear relationships), homoscedasticity (residuals were evenly distributed), or normality of residuals (histogram and Q-Q plot showed normal distribution).

The regression model was significant, $F(7, 429) = 11.28$, $p < .001$, and explained 15.5% of the variance in GPA. Professional specialization was a significant predictor of GPA, with nursing students having significantly higher GPAs compared to anesthesia students ($\beta = .27$, $p < .001$), after controlling for demographic variables. Age ($\beta = .12$, $p = .011$) and year of study ($\beta = .19$, $p < .001$) were also significant predictors of GPA, with older students and those in higher years of study having higher GPAs. Gender and university were not significant predictors of GPA.

Table 3 presents the results of the multiple linear regression analysis, including the unstandardized and standardized regression coefficients, t-values, and p-values for each predictor variable.

Table 3
Multiple Linear Regression Analysis Predicting GPA (N = 437)

Predictor	B	SE B	β	t	p
(Constant)	2.46	0.26		9.44	<.001
Age	0.03	0.01	.12	2.55	.011
Gender	0.05	0.04	.05	1.21	.226
Year of Study	0.10	0.02	.19	4.23	<.001

Predictor	B	SE B	β	t	p
University	0.01	0.01	.04	0.99	.324
Specialization					
Nursing vs. Anesthesia	0.28	0.05	.27	5.67	<.001
Surgery vs. Anesthesia	0.10	0.05	.09	1.93	.054

Note. $R^2 = .155$, $F(7, 429) = 11.28$, $p < .001$.

Discussion

This study investigated the relationship between professional specialization and educational achievement among nursing, surgery, and anesthesia students in Saudi Arabia. The findings revealed significant differences in educational achievement across the three specializations, with nursing students outperforming their peers in surgery and anesthesia. The regression analysis confirmed the significant predictive effect of professional specialization on educational achievement, even after controlling for demographic variables.

The higher educational achievement of nursing students compared to surgery and anesthesia students could be attributed to several factors. Nursing education in Saudi Arabia has undergone significant reforms in recent years, with a focus on improving the quality of nursing education and aligning it with international standards (Almalki et al., 2011). These reforms have included the development of new curricula, the adoption of innovative teaching methods, and the provision of clinical training opportunities for nursing students (Aldossary et al., 2008). These initiatives may have contributed to the higher educational achievement of nursing students in this study.

Another factor that may have contributed to the higher educational achievement of nursing students is the nature of nursing education and practice. Nursing education emphasizes the development of a broad range of clinical skills, critical thinking, and problem-solving abilities (Almalki et al., 2011). Nursing students are also exposed to a variety of clinical settings

and patient populations, which may enhance their learning experiences and outcomes (Aldossary et al., 2008). In contrast, surgery and anesthesia education may focus more on the development of technical and procedural skills, which may require different learning strategies and approaches (Aljohani et al., 2020).

The significant predictive effect of age and year of study on educational achievement is consistent with previous research (Aljohani et al., 2020). Older students and those in higher years

of study may have more academic and clinical experience, which may contribute to their higher educational achievement. They may also have developed more effective learning strategies and study habits over time, which may enhance their academic performance (Almalki et al., 2011).

The non-significant effect of gender on educational achievement is inconsistent with some previous studies that have found gender differences in academic performance among healthcare students (Aljohani et al., 2020). However, this finding suggests that gender may not be a significant factor influencing educational achievement among nursing, surgery, and anesthesia students in Saudi Arabia. This may be due to the increasing gender equality and opportunities in healthcare education in Saudi Arabia, as well as the similar learning experiences and challenges faced by male and female students (Aldossary et al., 2008).

The non-significant effect of university on educational achievement suggests that the quality of healthcare education may be relatively consistent across universities in Saudi Arabia. This may be due to the standardization of healthcare education programs and the availability of similar resources and support services across universities (Almalki et al., 2011). However, further research is needed to examine the specific factors influencing the quality of healthcare education in different universities in Saudi Arabia.

Implications for Healthcare Education

The findings of this study have important implications for healthcare education in Saudi Arabia. The significant differences in educational achievement across nursing, surgery, and anesthesia specializations highlight the need for tailored interventions and support services to address the unique needs and challenges faced by students in each specialization. For example, nursing education programs may need to focus on providing more clinical training opportunities and simulation experiences to enhance students' clinical skills and confidence (Almalki et al., 2011). Surgery and anesthesia education programs may need to focus on providing more hands-on training and mentorship to support students' technical and procedural skill development (Aldossary et al., 2008).

The significant predictive effect of age and year of study on educational achievement suggests that healthcare education programs may need to provide additional support and resources for younger students and those in earlier years of study. This may include providing academic advising, tutoring, and mentorship programs to help students develop effective learning strategies and study habits (Aljohani et al., 2020). Healthcare education programs may also need to provide more opportunities for older students and those in higher years of study to engage in research, leadership, and professional development activities to further enhance their educational achievement and career prospects (Almalki et al., 2011).

The non-significant effect of gender on educational achievement suggests that healthcare education programs may need to continue to promote gender equality and provide equal opportunities for male and female students. This may include providing mentorship and networking opportunities for female students, as well as addressing any gender-based barriers or biases in healthcare education and practice (Aldossary et al., 2008).

Limitations and Future Research

This study has several limitations that should be considered when interpreting the findings. First, the study used a convenience sampling technique, which may limit the generalizability of the findings to other healthcare specializations or settings. Future research should use more representative sampling techniques to enhance the external validity of the findings. Second, the study relied on self-reported data, which may be subject to social desirability bias or recall bias. Future research should use more objective measures of educational achievement, such as academic records or standardized test scores, to enhance the reliability and validity of the findings.

Third, the study only examined the relationship between professional specialization and educational achievement, without considering other potential factors that may influence academic performance, such as learning styles, academic motivation, or social support. Future research should examine the complex interplay of individual, social, and environmental factors that may influence educational achievement among healthcare students in Saudi Arabia. Finally, the study used a cross-sectional design, which does not allow for causal inferences or examination of changes over time. Future research should use longitudinal designs to examine the long-term effects of professional specialization on educational achievement and career outcomes among healthcare students in Saudi Arabia.

Conclusion

This study investigated the relationship between professional specialization and educational achievement among nursing, surgery, and anesthesia students in Saudi Arabia. The findings revealed significant differences in educational achievement across the three specializations, with nursing students outperforming their peers in surgery and anesthesia. The regression analysis confirmed the significant predictive effect of professional specialization on educational achievement, even after controlling for demographic variables. The findings suggest that healthcare education programs in Saudi Arabia may need to provide tailored interventions and support services to address the unique needs and challenges faced by students in each specialization. Future research should examine the complex interplay of individual, social, and environmental factors that may influence educational achievement among healthcare students in Saudi Arabia, using more representative sampling techniques, objective measures, and longitudinal designs.

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