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Examination of the effect of individual innovation on entrepreneurship and problem solving skills in midwifery students

Ebelik öğrencilerinde bireysel yenilikçiliğin girişimcilik ve problem çözme becerilerine etkisinin incelenmesi

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ABSTRACT

Aim: The study was conducted to determine the effects of individual innovativeness characteristics on individual entrepreneurship perception and problem solving skills in midwifery students.

Methds: The sample of the study, which is descriptive and relationship seeker, consisted of 538 students who were studying at Inonu University, Fırat University and Munzur University Faculty of Health Sciences Department of Midwifery between March-April 2020 and accepted to participate in the study. Data were collected online using the Personal Information Form, Individual Innovativeness Scale (IIS), Individual Entrepreneurship Perception Scale (IAS) and the Problem Solving Inventory (PSI).

Results: The total score average of the students from the IIS, IAS and PSI was 65.22 ± 8.84, 66.76 ± 18.87 and 91.95 ± 15.67,respectively. According to individual innovation characteristics such as innovative, pioneering, questioning, skeptical and traditionalist, the difference between the overall average score obtained from IIS, IAS and PSI was statistically significant ($p<0.05$). In addition, a negative significant correlation was found between IIS, IAS and PSI ($r=-0.097$ $p<0.001$; $r=-0.274$ $p<0.001$, respectively) and a significant correlation was found between the Pioneer, interrogator and skeptical characteristics of students and the IAS and between the Pioneer characteristic and the PSI according to the individual characteristics of innovation ($r= 0.171$ $p<0.05$; $r= -0.148$ $p<0.05$; $r= -0.270$ $p<0.05$; $r= -0.223$ $p<0.05$, respectively).

Conclusion: It was determined that there is a statistically significant difference between the individual innovativeness characteristics of the students and their entrepreneurship perception and problem solving skills.

Keywords: entrepreneurship; individuality; midwifery; problem solving

ÖZET

Amaç: Araştırma ebelik bölümü öğrencilerinde bireysel yenilikçilik özelliklerinin, bireysel girişimcilik algısına ve problem çözme becerisine etkisini belirlemek amacıyla yapılmıştır.

Yöntem: Tanımlayıcı ve ilişki arayıcı tipte ki bu araştırmanın örneklemini, Mart-Nisan 2020 tarihleri arasında İnönü Üniversitesi, Fırat Üniversitesi ve Munzur Üniversitesi Sağlık Bilimleri Fakültesi Ebelik Bölümünde ki araştırmaya katılmayı kabul eden 538 öğrenci oluşturdu. Veriler online olarak, Kişisel Bilgi Formu, Bireysel Yenilikçilik Ölçeği (BYÖ), Bireysel Girişimcilik Algı Ölçeği (BGAÖ) ve Problem Çözme Envanteri (PÇE) ile toplandı.

Bulgular*:* Öğrencilerin BYÖ'den aldıkları toplam puan ortalaması 65.22±8.84, BGAÖ'den aldıkları toplam puan ortalaması 66.76±18.87 ve PÇBE'den aldıkları toplam puan ortalaması ise 91.95±15.67'dir. Öğrencilerin yenilikçi, öncü, sorgulayıcı, kuşkucu ve gelenekçi gibi bireysel yenilikçilik özelliklerine göre BYÖ, BGAÖ ve PÇE'den aldıkları toplam puan ortalamaları arasındaki fark istatiksel olarak anlamlı bulunmuştur ($p<0.05$). Ayrıca BYÖ ile BGAÖ ve PÇE arasında negatif yönde anlamlı korelasyon bulundu (sırasıyla $r=-0.097$ $p<0.001$; $r=-0.274$ $p<0.001$) ve öğrencilerin bireysel yenilikçilik özelliklerine göre Öncü, Sorgulayıcı ve Kuşkucu Özellikleri ile BGAÖ arasında ve Öncü özelliği ile PÇE arasında anlamlı korelasyon bulundu (sırasıyla $r=0.171$ $p<0.05$; $r=-0.148$ $p<0.05$; $r=-0.270$, $p<0.05$; $r=-0.223$, $p<0.05$).

Sonuçlar: Öğrencilerin bireysel yenilikçilik özellikleri ile, problem çözme becerisi ve girişimcilik algısı arasında istatistiksel olarak anlamlı bir fark olduğu belirlendi.

Anahtar kelimeler*:* bireysellik; ebelik; girişimcilik algısı; problem çözme

Introduction

Innovation is to embody an existing knowledge or thought at the right time and turn it into new knowledge that is more useful to society (Luecke, 2008). Innovation, on the other hand, is the practice that encourages the development of new and more different ideas formed by the creativity of individuals (Yazıcı, 2000). The concept of innovation is divided into different classes in terms of its characteristics, levels, areas, degrees and processes (Kumar & Uzkurt, 2011). One of them is individual innovation, which is used to determine the categories and levels of people (Kılıc, 2015). Individual innovation can be defined as being an entrepreneur against innovation, accepting innovation and taking advantage of it, that is, displaying a positive attitude as a behavior (Kılıcer, 2011). People with low innovative characteristics are people with low access to accurate information, configuration of information, problem solving, creative thinking and associated interference.

Innovation, which is vital in the field of Health, and progress in its continuation prevent unnecessary costs that may arise by increasing the opportunities for early diagnosis and treatmet (Şengün, 2016). An innovative midwife develops new approaches, ideas and, as a result, more creative alternatives than existing products to meet the needs of patients, improving the quality of the health care it provides, as well as supporting evidence-based practices in the field of midwifery (Culha, Turan & Kaya, 2017). Innovative aspects of midwives with leadership characteristics enable them to hold a managerial

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position and entrepreneurial aspects are also brought to the forefront.

Entrepreneurship covers the processes of chasing opportunities, taking risks and innovating by implementing them (Aytac & Ilhan, 2007). Basically, the principles that entrepreneurship focuses on are very similar to innovation (Cevik, 2006). Entrepreneurship has a major role in the development and settlement of innovation. Therefore, the factors affecting entrepreneurship should be determined and the attitudes and practices that will bring the entrepreneurial aspects of people to the forefront should be studied (Cetinkaya Bozkurt, Kalkan, Koyuncu & Alparslan, 2012). Entrepreneurial people should be able to communicate well with people, take risks, have an individual vision, be open to innovation and change, have a managerial spirit and be success-oriented (Arslan, 2002). As with other health services, it is important to strengthen the link between entrepreneurship and innovation for professional development in the field of midwifery. Many health problems are solved by comprehensive thinking, multidisciplinary approach and active use of problem solving abilities. In this direction, entrepreneurship develops different alternatives for solving health problems and is often used in terms of preventing diseases and improving health (Boore & Porter, 2011; Salminen, Lindberg, Gustafsson, Heinonen & Leino-Kilpi, 2014).

Problem solving is that people create goals for the problems they face. As in all areas of health, midwives in the midwifery profession are expected to effectively solve the problems encountered in patient care, management and team work. In this context, midwives are expected to be able to adapt easily to changes and developments, to achieve accurate information and to assimilate (Tezel at al., 2009). In order to improve the quality of service in health care practices, health professionals should take planned initiatives by realizing the problems of patients and gain problem-solving skills before going to professional practices (Wang, Kao Lo, Chen, Lee Hsieh & Ku, 2002). Developing Problem-solving skills requires a process and can only be gained by training (Kanbay, Aslan, Isık & Kılınc, 2013). For this reason, in order to improve students' problem-solving skills, educators need to develop different educational strategies and follow their results carefully (Karadag, Iseri & Etikan, 2014).

In light of this information, determining the individual innovation levels of midwifery students and determining the impact of this on entrepreneurship perception and problem solving skills is very important for future midwives to take a professional approach in health care practices. This research was conducted to determine the effect of individual innovation characteristics on individual entrepreneurship perception and problem solving skills in midwifery department students.

Methods

March-April 2020, the research was conducted with students studying Inonu University, Fırat University and Munzur University in the midwifery Department of the Faculty of Health Sciences. In the study, all students were tried to be reached without any sample size calculation (n=558). Survey forms created through Google Form were transmitted to student groups via social media (WhatsApp).The 538 midwifery students who agree to participate in the research (Inonu University n=251, Fırat University n=244, Munzur University n=43) were included in the study, 20 students who did not complete the questionnaire and submitted the missing questionnaire refused to participate in the study. In order to carry out the research, ethical approval was obtained from Munzur University Health Sciences Scientific Research and publication Ethics Committee (decision no: 27.02.2020/2-2) and research permission was obtained from the relevant institutions. By providing students with information about the research, volunteers who stated that their individual information would be protected were included in the research.

Data collection tools

Personal information form

It was created by researchers, students' identification (age, class, level and frequency of technology use, etc.) consists of 9 questions aimed at determining its characteristics.

Individual Innovation Scale (IIS)

The scale developed in order to evaluate the innovation of individuals in a general sense was established in 1977 by Hurt et al. it was developed by, and its adaptation to Turkish was made by Kılıcer, Odabası and Şengün (2010). Expressions on the scale are scored as a 5-point likert substance. Totally 12 of the scale items are positive (1, 2, 3, 5, 8, 9, 11, 12, 14, 16, 18. and 19.), 8 are negative substances (4, 6, 7, 10, 13, 15, 17. and 20.). Innovation score is calculated by adding 42 points to the score obtained by subtracting the total score obtained from positive substances from the total score obtained from negative substances. With the help of the scale, the lowest 14 points and the highest 94 points can be obtained. Individuals are interpreted as “innovative” if the calculated score is above 80 points, “Pioneer” if it is between 69 and 80 points, “interrogator” if it is between 57 and 68 points, “skeptical” if it is between 46 and 56 points, and “traditionalist” if it is below 46 points. In addition, according to the score calculated using the scale, it is also possible to evaluate the level of innovation of individuals in general. The internal consistency coefficient of the scale was found to be 0.82 (Hurt, Joseph & Cook, 1977; Kılıcer, Odabası & Şengün, 2010). In this study, cronbach's alpha value of the scale was found to be 0.79.

Individual Entrepreneurship Perception Scale (IAS)

The scale was developed by Incik and Uzun (2017) and consists of 31 items and six sub-dimensions. The minimum score that can be obtained from the scale is (31x1) 31 and the maximum score is (31x5) 155. The sub-dimensions of the scale, were identified as planning respectively (1, 2, 3, 4, 5, 6), locus of control (12, 13, 14,7, 8, 9, 10, 11,), self-confidence (17, 18, 15, 16, 19, 20), communication (21, 22, 23, 24), motivation (25, 26, 27, 28), and self-discipline (29, 30, 31). As the overall score from the scale increases, the perception of individual entrepreneurship increases in the same direction. Negative matter is not included in the scale. In the evaluation of scale items, it is encoded as 5, 4, 3, 2, and 1, with absolutely agree, (5) agree, (4) disagree, (3) disagree, (2) strongly disagree (1). Cronbach's alpha value for the sum of the scale is calculated as 0.92 (Incik & Uzun, 2017). In this study, Cronbach's alpha value of the scale was found to be 0.95**.**

Problem Solving Skill Inventory (PSI)

It was developed by Heppner and Peterson in 1982. The first adaptation, reliability and validity studies of the inventory were conducted by Taylan (1990). Inventory of 35 items is a likert-type scale, rated between 1-6. Negative substances are reversed in scoring (1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30, and 34). Some substances are excluded from scoring (9, 22, and 29). The lowest score that can be obtained from the

scale with 32 items evaluated is 32 and the highest score is 192. The height of the total scores taken from the inventory indicates that the individual perceives himself as inadequate in problem solving skills, while the low score indicates that the individual perceives himself as sufficient in problem solving. Consists of three different sub-dimension. Problem-solving confidence subscale 19, 23, 24, 27, 5, 10, 11, 12, 33, 34 and 35, Approach Avoidance subscale 1, 2, 15, 16, 17, 4, 6, 7, 8, 13, 18, 20, 21, 28, 30 and 31, and finally the personal control subscale includes 3, 14, 25, 26 and 32 questions. The Cronbach's alpha value of the scale was found between 0.77 and 0.81. (Heppner & Peterson, 1982; Taylan, 1990). In this study, the Cronbach's alpha value of the scale was found to be 0.71.

Statistical analysis

The data of the study were evaluated using SPSS 25.0 for Windows software (SPSS, Chicago, Il, USA). In addition to descriptive statistics (number, mean, percentage, and standard deviation), the Kruskal-Wallis analysis and Pearson correlation analysis were used to evaluate the relationship between variables. Statistical significance was set at P <005.

Results

The introductory characteristics of the students are given in Table 1. The average age of the students is 20.55 ± 1.87 years old, 46.7% of them are studying at Inonu University and 42.9% of them are Midwifery 1st grade students. The most used technological device by the students was the smart phone with 92.9%. 56.1% of the students stated the frequency of smartphone use as "frequently" and 82.0% of them were undecided about the level of innovation they perceived themselves (Table 1).

Table 1. Distribution of students' descriptive characteristics (n=538)

Variables	n	%
Age (y) (Mean±SD)	20.55 ± 1.87	
School		
Inonu university	251	46.6
Fırat university	244	45.4
Munzur university	43	8.0
Class		
Midwifery 1st class	231	42.9
Midwifery 2nd class	11	20.6
Midwifery 3rd grade	116	21.6
Midwifery 4th grade	80	14.9
Technological tool used		
Computer	32	5.9
Tablet	6	1.2
Smarth phone	500	92.9
Frequency of use		
Rarely	9	1.7
Sometimes	71	13.2
Frequently	302	56.1
Often	156	29.0
Innovative self-perception level of students *		
Innovator	79	14.7
Unstable	442	82.0
Traditionalist	17	3.3

* The level of innovation asked by the researcher

In Table 2, the distribution of the average score taken by students from IIS, IAS and PSI is given, the total average score taken by students from IIS is 65.22±8.84 (min:38; max: 38-91), the total average score taken from IAS is 66.76±18.87 (min:31; max: 147). IAS also an average of the points they received from the sub-dimensions, respectively; 13.69±4.16 (min:6; max: 30), 16.94± 4.83(min:8; max: 40), 12.30± 4.24(min:6; max: 30), 8.45 ±2.78(min:4; max: 20), 8.62 ±3.13(min:4; max: 20), and 6.74 ±2.07(min:3; max: 15). The average score of the students from PSI is 92.57±17.58 and the min-max value is 57-168. The average score they received from the sub-dimensions of the PSI, respectively; 28.92 ±6.74, 46.05± 8.89, 16.97± 3.61 and min-max values are 11-53, 23-97, 8-56, respectively.

Table 2. Distribution of min-max values with the average score obtained by students from IIS, IAS, PSI and the sub-dimensions of these scales (n=538)

	Mean ± SD	Min-Max
IIS Total	65.22±8.84	38-91
IAS Total	66.76±18.87	31-147
Planning	13.69±4.16	6-30
Focus of control	16.94± 4.83	8-40
Self-confidence	12.30± 4.24	6-30
Communication	8.45 ±2.78	4-20
Motivation	8.62 ±3.13	4-20
Self-Discipline	6.74 ±2.07	3-15
PSI Total	91.95±15.67	57-168
Problem solving confidence	28.92 ±6.74	11-53
Approach avoidance	46.05± 8.89	23-97
Personal control	16.97± 3.61	8-56

IIS: Individual Innovation Scale
IAS: Individual Entrepreneurship Perception Scale
PSI: Problem Solving Skill Inventory

Chart 1 shows the distribution of innovation characteristics of midwifery students according to individual innovation characteristics. According to this distribution, 5.6% of the students participating in the study are innovative, 30.3% are pioneer, 48% are interrogator, 14.5% are skeptical, and 1.7% are traditionalist.

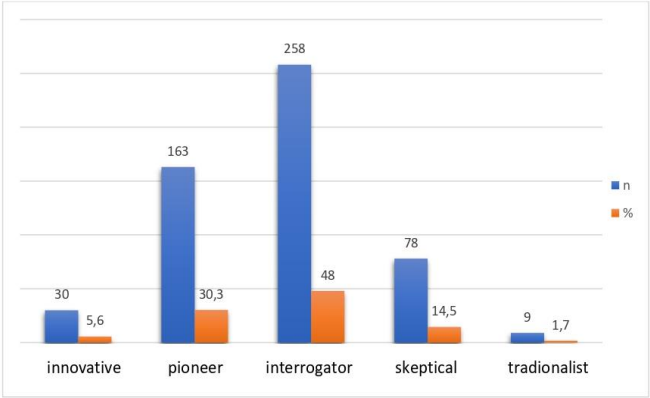

Chart 1. Distribution of students by individual innovation characteristics (n)%

In Table 3, a comparison of the total average score obtained from IAS and PSI is given according to the individual innovation characteristics of the students. It was determined that there was a statistically significant difference between the innovative, pioneer, interrogator, skeptical and traditionalist characteristics of the students' IAS and PSI total score averages and that this difference was more significant in the skeptical, pioneer and interrogator characteristics (KW=24.371, p<0.05; KW=51.807, p<0.05) (Tablo 3). In Table 4, correlations were given between the students' total IIS score and their total

Table 3. Comparison of the total average score obtained by students from IAS and PSI according to individual innovation characteristics (n=538)

	Innovator (n=30)	Pioneer (n=163)	Interrogator (n=258)	Skeptical (n=78)	Tradionalist (n=9)	Test and p value
IAS	74.63±20.94	65.04±12.26	63.95±18.94	76.61±23.65	66.77±29.32	KW=24.371 p=0.000
PSI	86.03±19.66	88.50±13.94	91.72±15.76	101.47±13.00	98.33±15.45	KW=51.807 p=0.000

IIS: Individual Innovation Scale
IAS: Individual Entrepreneurship Perception Scale
PSI: Problem Solving Skill Inventory
KW: Kruskall-Wallis Analysis

Table 4. Correlation between students' total IIS score and their total scores from IAS, PSI and the sub-dimensions of these scales according to individual innovation characteristics

		IIS	Innovator	Pioneer	Interrogator	Skeptical	Tradionalist
IAS	**r**	-0.097**	0.020	0.171*	-0.148*	-0.270*	0.313
	p	<0.001	0.915	0.029	0.017	0.017	0.413
PSI	**r**	-0.274**	0.085	-0.223*	-0.079	-0.060	-0.278
	p	<0.001	0.657	0.004	0.207	0.602	0.468

IIS: Individual Innovation Scale
IAS:Individual Entrepreneurship Perception Scale
PSI: Problem Solving Skill Inventory

IAS, PSI scores according to individual innovation characteristics. A negative significant correlation was found between IIS and IAS and PSI (r=-0.097 p<0.001; r=-0.274 p<0.001, respectively). In addition, a significant correlation was found between pioneer, interrogator and skeptical characteristics and IAS according to the individual characteristics of innovation of students, and between pioneer and PSI (r=0.171 p<0.05; r=-0.148 p<0.05; r=-0.270, p<0.05; r=-0.223, p<0.05, respectively) (Table 4).

Discussion

Individual innovation can be defined as being an entrepreneur versus innovation (Kılıcer, 2011). People with low innovative characteristics are people with low problem solving ability and lack of interventional direction. Individual innovation and entrepreneurship are vital in the field of health. Because it is important for midwives to develop creative alternatives to meet the needs of patients and to improve their ability to cope with the problems they face. For this reason, this research was conducted to determine the impact of individual innovation characteristics on individual entrepreneurship perception and problem solving skills in midwifery department students.

According to the average score of the students participating in the study from the individual innovation scale, it was determined that the students had an interrogative property (65.22±8.84). In the research conducted by Korucu and Olpak, the average score of students was 63.99; in the study conducted by Genc the average level of individual innovation of university students was 62.09; in the study conducted by Bodur the total score of individual innovation (innovation) of stunted nursing students was 63.12 (Korucu & Olpak, 2015; Bodur, 2018). These findings support the findings of our study and the individual innovativeness characteristics of the students are at a high level according to their mean scores. Interrogator students are wary of innovation and prefer to avoid taking risks. This result parallels other studies that assess university students' individual levels of innovation (Kılıcer, 2011; Kert & Tekdal, 2012; Korucu & Olpak, 2015; Bodur, 2018). It is noteworthy that there are few “innovators” among students. Students can be said to be pioneering in noticing innovations and able to opinion leadership, but they are questioning because they are afraid to take risks. However, innovative individuals see experimenting with new ideas and taking risks as a way of life. According to these results, we can say that university students are cautious about innovation and expect innovation to be recognized by society first, after observing a concrete perception of utility, they accept innovation.

The average score of the students in the study on the entrepreneurship perception scale was 66.76±18.87. Considering that the highest score that can be obtained from the scale is 155, and as the score increases, the perception of individual entrepreneurship also increases in the same direction, it can be said that the perception of individual entrepreneurship in the study is at a low level. In the study conducted by Kılavuz and Aydın, nursing students' IAS total score average was 119.98, Bahar and his colleagues were 136.78, Dolu and his colleagues were 139.75 (Kılavuz & Aydın, 2020; Bahar, Kocacal Güler, Arslan, Inem & Cimen, 2019; Dolu, Temucin & Ozkan, 2016). We believe that this difference between our study and the literature was caused by the difference in the personality characteristics of students. At the same time, considering that among the factors affecting entrepreneurship perception, the personel level of self-innovative perception also has an effect (Akpinar & Kücükgöksel, 2015), according to the results obtained in our study, students are ambivalent about their level of innovative perception (45%). This also negatively affects students' perception of entrepreneurship.

The average score of the students participating in the study from the inventory of problem solving skills is

91.95±15.67. In the study conducted by Tezel and colleagues, the average PCH score of nursing students was 89.9±22.1. In the study conducted by Durmaz and his colleagues, the average PSI score of School of health students was 82.37±19.23, in Altun's the study, the average score of students in the nursing and midwifery PSI 84.74±19.00. And in the study of Koç and his colleagues, the average score of midwifery students was 107.88±12.91, in Yildirim's study, nurses 'PSI scale total score was 93.03, in Basar's study, the PSI scale total score was 88.47. In the study conducted by Erkus and Bahcecik the average score of nurses was 101.41 and the average score of executive nurses was 102.67 (Altun, 2003; Durmaz at al., 2007; Koç, Koyuncu & Saglam, 2015; Tezel at al., 2009; Yıldırım, 2016; Basar, Akin & Durna 2011; Erkus & Bahcecik, 2015). The height of the total scores taken from the inventory (32-192) indicates that the individual perceives himself as inadequate in the PSI, while the person is considered positive in its decrease. In our study, we can say that the problem solving skills of students are moderate in accordance with the literature (Yıldırım, 2016; Basar, Akin &Durna 2011; Erkus & Bahcecik, 2015).

In our study, the difference between the average score obtained by students from IAS and PSI according to individual innovation characteristics was statistically significant ($p<0.05$). In addition, our study found a negative significant correlation between IIS, IAS and PSI, respectively ($r=-0.097$ $p<0.001$; $r=-0.274$ $p<0.001$). And a significant correlation was found between the pioneer, interrogator and skeptical characteristics of students and the IAS and between the pioneer characteristic and the PSI according to the individual characteristics of innovation (respectively $r=0.171$ $p<0.05$; $r=-0.148$ $p<0.05$; $r=-0.270$, $p<0.05$; $r=-0.223$, $p<0.05$). Different studies have not been found in the literature examining the relationship between IAS and PSI according to individual innovation characteristics. Based on these findings, the fact that students participating in the study have interrogator characteristics within individual innovation characteristics negatively affects their perception of entrepreneurship and problem solving skills.

Limitations

This work has several important limitations. First, since data is collected online, the accuracy of students' responses can be questioned. In addition, our study was conducted only with students of the midwifery department of 3 universities. Therefore, the findings cannot be generalized to all midwifery students.

Conclusion and Recommendations

The results showed that midwifery students had questionable traits against individual innovations and therefore low levels of entrepreneurship. It can also be said that as students' level of innovation increases, their entrepreneurial tendencies will increase positively and their problem-solving skills will improve.

The working group of this study was composed of midwifery department students studying at the Faculty of Health Sciences in three state universities. For this reason, in order to generalize the research findings, it is recommended to conduct more extensive research, including students studying at different faculties of Health Sciences. Also, in future research, individual differences are taken into account various individual features that may be considered effective on innovation studies, the variable is considered important because it would enable the individual to gain knowledge about innovation more.

Conflict of interest

The authors declare that there were no potential conflicts of interest with regard to the research, authorship and/or publication of this article.

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Ethics Committee Approval

Ethics committee approval for this study was obtained from the Ethics Committee of Munzur University with the decision dated 27.02.2020 and numbered 2020 / 9-6 (Number: 27.02.2020/2-2).

Informed Consent

Informed consent was obtained from midwifery students who participated in this study.

Peer-review

Externally peer-reviewed.

Author Contributions

Z.S .: Collection of Data, Writing the Article.

Ü.U .: Statistical Analysis, Critical Reading.

A.N.Y.: Writing the Article, Statistical Analysis, Critical Reading.

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