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Perspectives of midwifery and nursing students on recommending the COVID-19 vaccine to women of reproductive age and factors influencing counseling competency: a cross-sectional study

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Abstract

Background: Vaccination rates among women of reproductive age are low, and many women are hesitant to get vaccinated.

Objectives: The aim of the study was to determine the opinions of senior midwifery and nursing students regarding the recommendation of the COVID-19 vaccine to women of reproductive age and to identify the factors that affect their counseling competency.

Methods: This cross-sectional study collected data from 504 senior midwifery and nursing students using the "Individual Identification Form," "Vaccine Opinion Form," and "Scale of Attitudes Toward the COVID-19 Vaccine" in an online environment with the snowball sampling method. Various statistical methods, such as the t-test, chi-square analysis, correlation analysis, ANOVA, logistic regression, and decision tree analysis, were used to analyses the collected data.

Results: Out of all the students, 84.3% were women, 50.2% belonged to the nursing department, and 97.6% had received at least two doses of the COVID-19 vaccine. While 44.4% of the students said they would not recommend vaccination to pregnant, breastfeeding, or planning to get pregnant women, 22.6% reported that they could suggest the COVID-19 vaccine to all three groups. The students who believed they had the competency to counsel others about vaccines and had previously received a flu shot were more likely to recommend a COVID-19 vaccine. On the other hand, the students who did not consider vaccines to be safe, believed they could be harmful, and had not received adequate training on vaccines were less likely to recommend them.

Conclusions: Students who lacked knowledge about COVID-19 vaccines and counseling competency were less likely to recommend vaccination.

Keywords: COVID-19 Vaccine, Nursing, Midwifery, Students, Pregnancy.

Introduction

While the World Health Organization (WHO) and many other international organizations recommend the COVID-19 vaccination, women of reproductive age are less likely to receive it due to their hesitation.[1,2] This is mainly because pregnant and breastfeeding women are often excluded from clinical trials, causing a lack of data on the vaccine's effectiveness and safety in this group. Additionally, concerns over fertility have contributed to vaccine hesitancy among women.[3,4] Women who are pregnant, breastfeeding, or planning to become pregnant should be advised about COVID-19 vaccinations due to the increased risk.[1,2,5]

Midwives and nurses are essential in vaccine counseling.[6] However, many of them are hesitant to promote COVID-19 vaccines and provide advice at a lower rate than physicians. It is suggested that vaccine recommendations for COVID-19 can be influenced by an individual's vaccine status, attitude towards vaccines, and knowledge of COVID-19 vaccines.[7,8]

Although studies have demonstrated the effectiveness of COVID-19 vaccines, nursing and midwifery students who provided one-on-one care in various areas during the pandemic and received training in clinics and primary

healthcare settings are a vital resource in promoting confidence among the community and women of reproductive age.[9] There was not enough evidence of sufficient vaccination recommendation and counseling competencies.[7] The evidence was limited to acceptance status and vaccination attitudes.[10,11]

Objectives

The purpose of this study was to assess the perspectives of senior midwifery and nursing students regarding the recommendation of COVID-19 vaccination for women of reproductive age, as well as the potential factors that could impact their counseling abilities.

Methods

The cross-sectional study was carried out during the period of March 15th to April 30th, 2022.

Participants

The research was conducted with senior students from the midwifery and nursing departments of Turkish universities. The sample size was calculated based on the students' recommendation that COVID-19 immunization be given to pregnant women at a rate of 20%.[7] The sampling error was set at 5%, with a 95% confidence level and a pattern effect of 2, calculated in the Epi Info program. The minimum sample size required was 492. Undergraduate midwifery and nursing programs in Turkish universities have a duration of four years. Only final-year students who were studying midwifery or nursing and agreed to participate in the study were included. Students from other classes were not included. The data was collected online using the snowball sampling method. A web-based questionnaire with informed consent was shared among midwifery and nursing students and lecturers through their social media accounts. The individuals who filled out the questionnaire were requested to spread it further on WhatsApp groups and social media platforms of their respective classes. The research aimed to collect information from a broader range of participants.

Instruments and data collection

Data were collected using the "Individual Identification Form", the "Opinion Form Regarding COVID-19 Vaccines in Reproductive Age" and the "Attitudes Towards COVID-19 Vaccine Scale."

"Individual Identification Form" was composed of ten questions that covered aspects such as age, gender, history of COVID-19 disease and vaccination, influenza vaccination, counseling competency, COVID-19 vaccine training, and keeping up-to-date with vaccine information.

"Attitudes Towards COVID-19 Vaccine Scale" is a 9-item questionnaire developed by Genis et al. The questionnaire uses a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire has two sub-dimensions: positive attitude (4 items) and negative attitude (5 items). The negative attitude sub-dimension is reverse-coded. To calculate the sub-dimension scores, the items in each sub-dimension are summed, and the mean of the sum is taken. A high score in the positive attitude sub-dimension indicates a positive attitude towards the vaccine, while a high score in the negative attitude sub-dimension indicates a low negative attitude towards the vaccine. In Genis et al.'s study, the Cronbach Alpha coefficient was 0.96 for the positive attitude sub-dimension and 0.78 for the negative attitude sub-dimension.[12] In our study, the Cronbach Alpha coefficients were 0.901 and 0.778, respectively, for the positive and negative attitude sub-dimensions.

"Opinion Form Regarding COVID-19 Vaccines in Reproductive Age": The researchers have meticulously examined the subject matter and devised a comprehensive form that addresses the opinions on COVID-19 vaccines among individuals in their reproductive years. This form is thoughtfully divided into two distinct sections.[7,8,13]

The term "reproductive age" was utilized in this research to encompass women who were either "pregnant," "breastfeeding," or had intentions of becoming pregnant. The initial section of the questionnaire consisted of seven statements that assessed the inclination towards recommending vaccines based on perceptions regarding the adequacy and reliability of research findings, as well as the potential adverse effects of the vaccine on "women planning to become pregnant, pregnant women, babies, breastfeeding." Each statement was responded to with either "I agree," "I disagree," or "I have no information."

Statements that could potentially impact vaccine recommendations negatively were assigned a score of "0," while positive opinions were assigned a score of "1." The scores for all statements were then aggregated. The resulting "opinion on COVID-19 vaccines in the reproductive age" ranged from 0 to 7. An increase in the score was interpreted as a favorable outlook towards COVID-19 vaccines. The internal consistency reliability coefficient (KR-20) for this section was calculated to be 0.822.

The second section of the study comprised a set of five questions aimed at gathering students' perspectives on COVID-19 vaccination for pregnant and breastfeeding women. Additionally, their opinions on recommending the COVID-19 vaccination for pregnant women, breastfeeding women, and women planning to become pregnant were also sought. The participants were asked to rate their vaccine recommendation status on a scale of 1 to 4. The options provided were as follows: 1) I absolutely do not suggest it; 2) I cannot recommend it because I lack expertise; 3) I only recommend it to high-risk women; and 4) I definitely recommend it.

The scoring system for vaccine recommendation status was as follows: those who responded with "I definitely do not recommend and cannot recommend it because I do not have information" were assigned a score of 0, indicating that they did not recommend the vaccine. On the other hand, those who responded with "I definitely recommend it and only recommend it to high-risk people" were assigned a score of 1, indicating that they did recommend the vaccine.

Furthermore, the researchers collected responses to determine the status of recommended immunization for all categories of women of reproductive age, including pregnant, breastfeeding, and those planning to become pregnant. Participants who scored three points were categorized as "recommending the vaccine to all groups," while those who scored zero points were categorized as "not recommending the vaccine to any group."

To ensure the validity of the content of the questionnaire, five expert midwives and nurses evaluated its content. Although three items required correction, no questions were removed or added. The content validity of the questionnaire was calculated to be 0.98 using the Davis technique.

Statistical analysis

Various statistical analyses were conducted to examine the data. Descriptive statistics, chi-square, t-tests, correlation analysis, ANOVA, binary logistic regression, and decision tree analysis were utilized. The normality of the distribution was assessed using skewness and kurtosis. Logistic regression analysis with the enter method was employed to identify the factors influencing the likelihood of recommending the COVID-19 vaccine to pregnant or breastfeeding women, or those planning to become pregnant, within the reproductive age group. The predicted variables included recommending vaccination to at least one group, gender, or department, receiving three doses of the COVID-19 vaccine (booster doses), receiving the flu vaccine, having contracted COVID-19, staying updated on COVID-19 vaccine information, receiving education, subjective counseling competency, positive and negative attitude scores towards COVID-19 vaccines, and opinions regarding COVID-19 vaccines among individuals of reproductive age.

To examine the factors that predict counseling competency, a decision tree analysis was used with the CHAID (Chi-squared Automatic Interaction Detection) model. Counseling competency was treated as the dependent variable, while gender, department, having contracted COVID-19, receiving the COVID-19 vaccine and flu vaccine, experiencing post-vaccine side effects, receiving education, staying updated on information, and positive and negative attitude scores towards COVID-19 vaccines were included as independent variables in the model.

The data set was divided into two equal parts, with 50% used for scanning and the remaining 50% for testing. All statistical analyses were performed using SPSS (version 16.0, SPSS Inc., Chicago, IL, USA). A significance level of "P-value" less than 0.05 was considered statistically significant.

Ethical considerations

The study received ethical approval from the University

Social and Human Sciences Ethics Committee (03.03.2022/74). The survey form did not collect any personal data. The study adhered to the principles of the Helsinki Declaration.

Results

The study included a total of 504 students, with a mean age of 22.29 years (range: 20–29). Among the participants, 84.3% were female, and 50.2% belonged to the nursing department. In terms of COVID-19 vaccination, 53.2% of the students had received three doses, while 80.5% had never received the flu vaccine. The findings revealed that midwifery students, those who had not been vaccinated against COVID-19 or had only received a single dose, and those who had never received the flu vaccine exhibited lower negative attitude scores towards COVID-19 vaccines. On the other hand, individuals who had received two doses and a booster dose of the COVID-19 vaccine, as well as those who stayed updated with information about COVID-19 vaccines, demonstrated higher positive attitude scores. These differences were statistically significant (P<0.05), according to Table 1.

Table 1. Students' attitudes towards the COVID-19 vaccine according to their introductory characteristics, counselling competency, current information follow-up and education status

Variables		All groups	Attitudes towards COVID-19 vaccine	
		n (%)	Positive attitude M± SD	Negative attitude M± SD
	Total	504 (100)	3.46 ± 1.06 (min-max:1-5)	3.52 ± 0.82 (min-max:1-5)
Gender	Female	425 (84.3)	3.44±1.05	3.51±0.81
	Male	79 (15.7)	3.53±1.07	3.55±0.85
	Test statistic, p		t: 0.641.p:0.522	t: 0.419.p:0.675
Department	Nursing	253 (50.2)	3.54±0.97	3.60±0.75
	Midwife	251 (49.8)	3.67±1.13	3.44±0.87
	Test statistic, p		t: 1.908. p:0.057	t: 2.199. **p:0.028**
Infected with COVID-19	Yes	171 (33.9)	3.44±1.06	3.49±0.80
	No	333 (66.1)	3.47±1.05	3.54±0.84
	Test statistic, p		t:0.278. p:0.781	t:0.617 p: 0.538
COVID-19 vaccination	No vaccine	8 (1.6)	1.84±0.89	2.18±0.83
	One dose of vaccine	4 (0.8)	2.00±1.17	2.35±1.25
	Two doses of vaccine	224 (44.4)	3.26±1.08*	3.39±0.82*.£
	Three doses of vaccine	268 (53.2)	3.69±0.95* £. $	3.68±0.73*.£.$
	Test statistic, p		F:17.582. **p≤ 0.001**	F: 16.803. **p≤ 0.001**
Side effects after COVID-19 vaccine (n=496)	No side effect	104 (20.9)	3.53±1.05	3.52±1.787
	Mild side effects	358 (72.2)	3.48±1.04	3.57±1.80
	Serious side effects	34 (6.9)	3.34±1.05	3.31±1.77
	Test statistic, p		F:0.420 p: 0.657	F:1.725. p:0.179
Flu vaccination	No vaccine	406 (80.5)	3.43±1.06	3.48±0.82
	At least one dose vaccine	98 (19.4)	3.56±1.05	3.68±0.79
	Test statistic, p		t:1.053. p:0.293	**t: 2.148. p: 0.032**
Counselling competency	Who think they can	50 (9.9)	3.68±1.14	3.54±0.99
	Not sure	289 (57.4)	3.38±1.07	3.59±0.79
	Who think they can't	165 (32.7)	3.51±1.01	3.55±0.80
	Test statistic, p		F:2.011. p: 0.135	F:0.250. p: 0.779
Up-to-date information on COVID-19 vaccines	Yes	271 (53.8)	3.62±1.03	3.58±0.84
	No	233 (46.2)	3.26±1.05	3.45±0.79
	Test statistic, p		t: 3.871, **p ≤ 0.001**	t:1.835, p:0.067
Get education on COVID-19 vaccines	Yes	101 (20.0)	3.60±0.95	3.58±0.84
	No	403 (80.0)	3.42±1.08	3.50±0.81
	Test statistic, p		t:1.585, p:0.114	t:0.814, p:0.416

*: difference with no vaccine, £: difference with one dose vaccine, $: difference with two dose vaccine

While 44.4% of respondents expressed their reluctance to recommend the COVID-19 vaccine to pregnant, breastfeeding, or women planning to become pregnant, there was no significant difference in vaccine recommendations based on the students' departments (P>0.05) [Figure 1].

However, individuals who believed in the vaccination of all pregnant and breastfeeding women against COVID-19 and indicated their willingness to recommend it to these groups, as well as those planning to become pregnant, exhibited higher scores on COVID-19 vaccine knowledge and displayed a more positive attitude towards COVID-19 vaccines during reproductive age [Table 2]. A moderate positive correlation was found between the mean score of COVID-19 vaccination attitudes among women of reproductive age and their positive (r: 0.493, P≤0.001) and negative attitude scores toward COVID-19 vaccinations (r: 0.424, P≤0.001).

It is worth noting that those who responded positively to each opinion question regarding COVID-19 immunizations in women of reproductive age expressed a higher likelihood of recommending the COVID-19 vaccine to all three groups compared to those who responded negatively. This finding is statistically significant (p ≤ 0.001) and is depicted in Figure 2.

Binary Logistic Regression Analysis yielded significant results when examining the factors that influence the recommendation of COVID-19 vaccines to women of reproductive age (X^2: 154.570; P≤0.001). The model accurately predicts the likelihood of recommending a COVID-19 vaccine at 35.4% (Nagelkerke R^2: 0.354). Individuals who possess the belief that they can provide guidance on COVID-19 vaccinations are more inclined to recommend them (OR: 2.788; 95% CI, 1.122–6.3925), as are those who have previously received influenza vaccines (OR: 1.784; 95% CI, 1.02–1.3116). The following information suggests that individuals who are uncertain about the safety of COVID-19 vaccines approved by the World Health Organization for pregnant women are less likely to recommend these vaccines. Likewise, those who consider the research on vaccine effectiveness in pregnant women insufficient, those who believe that COVID-19 vaccines may cause severe side effects in pregnant women, and those who are concerned that the vaccine may harm the baby are also less likely to recommend the vaccines. Additionally, individuals who lack training in this field are less likely to recommend COVID-19 vaccines. These findings are based on statistical analysis, as shown in Table 3.
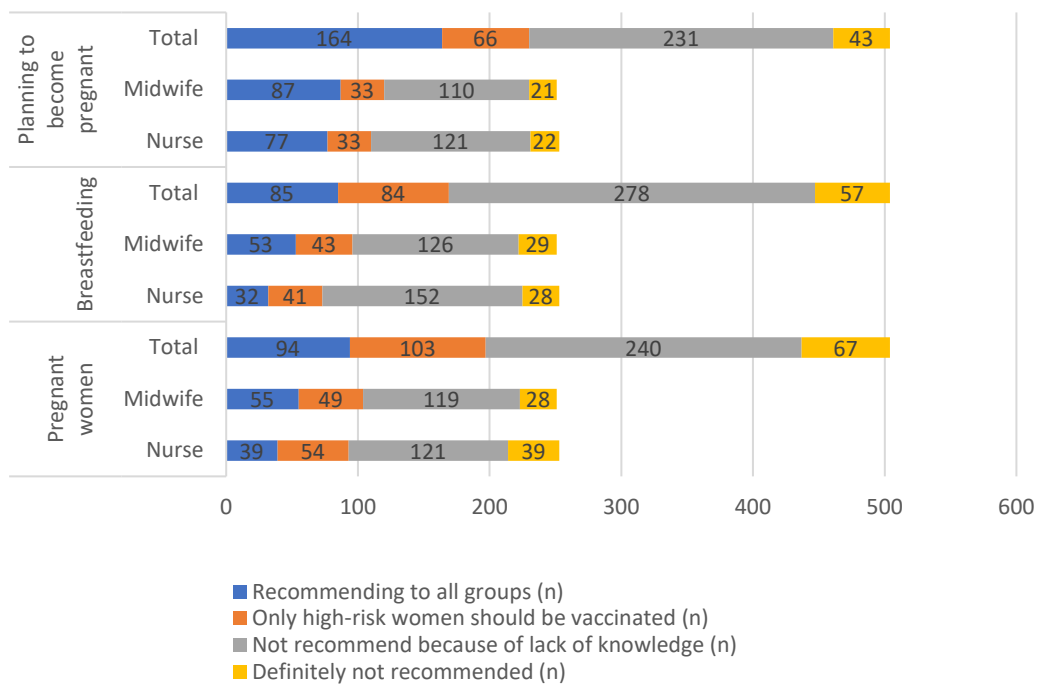

Figure 1. Distribution of midwifery and nursing students recommending COVID-19 vaccine to women of reproductive age

Table 2. Vaccination attitude and opinions about vaccination in women of reproductive age according to the COVID-19 vaccine recommendation status of the students

Variables		All groups	COVID-19 vaccine attitude		Vaccination opinion mean score in reproductive age
		n (%)	Positive attitude M± SD	Negative attitude M± SD	M± SD
Opinions of pregnant women about getting the COVID-19	Pregnant women should not be vaccinated	82 (16.3)	2.61± 0.99	2.91 ± 0.76	0.98 ± 1.12
	Only high-risk pregnant women should be vaccinated	96 (19.0)	3.34 ± 0.93[a]	3.31± 0.74[a]	2.43 ± 1.95 [a]
	Only low-risk people should be vaccinated	20 (4.0)	3.54 ± 0.89[a]	3.60 ± 0.50[a]	3.35 ± 2.11 [a]
	All pregnant women should be vaccinated	98 (19.4)	4.15 ± 0.84[a,b,c]	3.99 ± 0.82 [a,b,d]	4.61 ± 1.96 [a,b,c,d]
	Lacking sufficient knowledge	208 (41.3)	3.51 ± 1.00[a]	3.62 ± 0.72[a,b]	1.69 ± 1.72 [a,b,c]
	Test statistic, p		F:29.684, **p<0.001**	F:26.628, **p<0.001**	F:62.646, **p<0.001**
The situation of recommending the COVID-19 vaccine to pregnant women	Not recommending	307 (60.9)	3.31± 1.08	3.43 ±0.81	1.54 ± 1.63
	Recommending	197 (39.1)	3.69 ±0.98	3.67 ±0.81	3.60 ± 2.24
	Test statistic, p		t: 3.999, **p≤0.00**	t: 3.267, **p:0.001**	t:11.134, **p≤0.001**
Opinions of breastfeeding women about getting the COVID-19 vaccine	Should not	100 (19.8)	2.92 ± 1.20 [n,m]	3.15 ± 0.86 [n,m]	1.80 ± 1.78 [n]
	Shoult do	153 (30.4)	3.914 ± 0.98	3.78 ± 0.84	4.29 ± 1.99
	I don't have knowledge	251 (49.8)	3.39 ± 0.92 [n]	3.50 ± 0.72 [n]	1.38 ± 1.47[n]
	Test statistic, p		F:31.103 **p<0.001**	F:19.244 **p<0.001**	F: 144.191. **p<0.001**
Recommendation of COVID-19 vaccine to breastfeeding women	Not recommending	335 (66.5)	3.333 ±1.09	3.44±0.82	1.78 ± 1.81
	Recommending	169 (33.5)	3.70± 0.94	3.67±0.78	3.47 ± 2.29
	Test statistic, p		t: 3.717, **p≤0.001**	t: 2.943, **p:0.003**	t:8.389, **p≤ 0.001**
Recommendation of COVID-19 vaccine for those planning to pregnancy	Not recommending	274 (54.4)	3.24±1.08	3.37±0.83	1.47 ± 1.63
	Recommending	230 (45.6)	3.71±0.97	3.70±0.76	3.39 ± 2.20
	Test statistic, p		t: 5.172, **p≤0.001**	t: 4.720, **p≤ 0.001**	t:10.943, **p≤ 0.001**
Recommendation vaccination to women of reproductive age	Not recommending to any group	224 (44.4)	3.20± 1.11	3.36± 0.85	1.23± 1.42
	Recommending to at least one group	78 (15.5)	3.53 ± 0.94	3.53 ± 0.69	2.36 ± 1.79 [x]
	Recommending to two group	88 (17.5)	3.60 ± 1.05 [x]	3.63 ± 0.742[x]	3.15 ± 2.18 [x]
	Recommending to all groups	114 (22.6)	3.79 ± 0.92 [x]	3.74 ± 0.82[x]	3. 92 ± 2.26 [x,z]
	Test statistic, p		F: 9.298, **p≤0.001**	F:6.488, **p≤ 0.001**	F:57.617, **p≤ 0.001**

There is a difference with a: Pregnant women should not be vaccinated, b: Only high-risk pregnant women should be vaccinated, c: Only low-risk people should be vaccinated, d: Lacking sufficient knowledge, n: Should not, m: I don't have knowledge, x: Not recommending to any group, z: Recommending to at least one group.
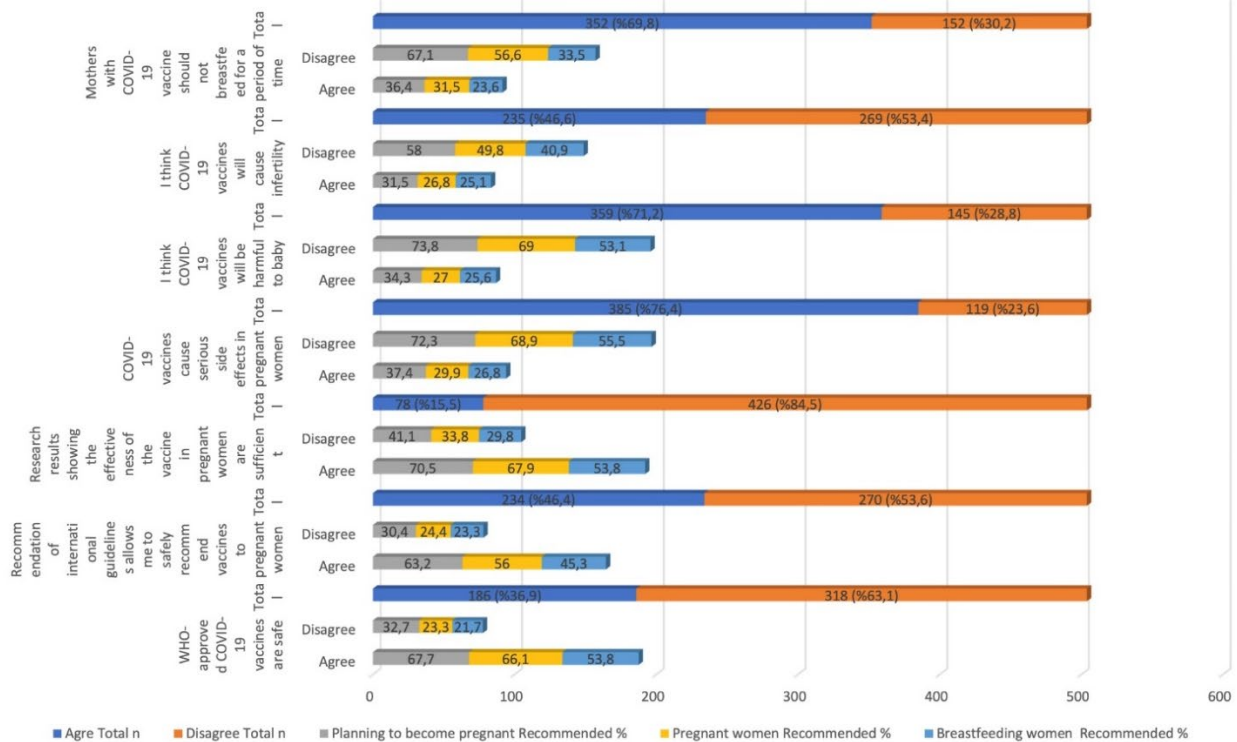
Figure 2. Distribution of the rates of recommending the COVID-19 vaccine according to participation in the views on vaccination in the reproductive age. The chi-square test revealed a significant difference in vaccination recommendation rates across the three groups (p ≤0.001)

Table 3. Evaluation of factors affecting students' probability of recommending vaccines by "binary logistic regression analysis"

	B	Sig.	Exp(B)	95% C.I.for EXP(B)
Gender (Ref: male)	-0.343	0.296	0.709	0.373- 1.351
Department (Ref: midwife)	0.198	0.455	1.219	0.725- 2.050
Infected with COVID-19 (Ref: Yes)	0.203	0.374	1.225	0.783- 1.915
The status of having the reminder dose of the COVID-19 vaccine. (Ref: The person who have the booster dose.)	0.131	0.587	1.140	0.710- 1.829
Influenza vaccination status (Ref: vaccinated)	0.579	**0.042**	1.784	1.021- 3.116
Up-to-date information on COVID-19 vaccines (Ref: not doing)	0.313	0.158	1.367	0.886- 2.110
Get education on COVID-19 vaccines (Ref: not get)	-0.713	**0.012**	0.490	0.281- 0.855
Perceived competence in COVID-19 vaccines (Ref: can be)	1.025	**0.027**	2.788	1.122- 6.925
Positive attitude score towards COVID-19 vaccine	0.010	0.943	1.010	0.769- 1.327
Negative attitude score towards COVID-19 vaccine	0.054	0.758	1.055	0.749- 1.487
I think that the COVID-19 vaccines approved by the World Health Organization are safe for pregnant women. (Ref: I don't agree)	-0.663	**0.017**	0.516	0.300- 0.887
The recommendation of international guidelines to vaccinate pregnant women for COVID-19 allows me to safely recommend vaccination to pregnant women. (Ref: I don't agree)	-0.399	0.114	0.671	0.409- 1.100
I am of the opinion that the research results showing the effectiveness of the vaccine in pregnant women are sufficient. (Ref: I don't agree)	-0.840	**0.029**	0.432	0.203- 0.920
I am of the opinion that COVID-19 vaccines will cause serious side effects in pregnant women compared to non-pregnant women. (Ref: I agree)	-0.647	**0.045**	0.524	0.278- 0.986
I think COVID-19 vaccines will harm the baby (Ref: I agree)	-1.066	**0.002**	0.344	0.178- 0.667
I think COVID-19 vaccines will cause infertility (Ref: I agree)	-0.364	0.140	0.695	0.429- 1.126
I think that mothers who have had the COVID-19 vaccine should not breastfeed for a certain period of time (Ref: I agree)	-0.186	0.514	0.830	0.475- 1.451
Constant	-0.801	0.312	0.449	
* Evaluation was made according to the vaccination recommendation status in at least one of the planning to pregnancy, pregnancy or breastfeeding periods				

The analysis of the decision tree revealed that obtaining training and staying updated with current information are key factors influencing counseling competency among students. The model was able to explain 50.0% of the variability in counseling competency. According to the model, individuals who received training on vaccines were more likely to believe they could provide counseling compared to those who did not receive training. Conversely, among those who did not receive training, individuals who stayed updated with current information had a higher belief in their ability to provide counseling (P<0.05) [Figure 3].
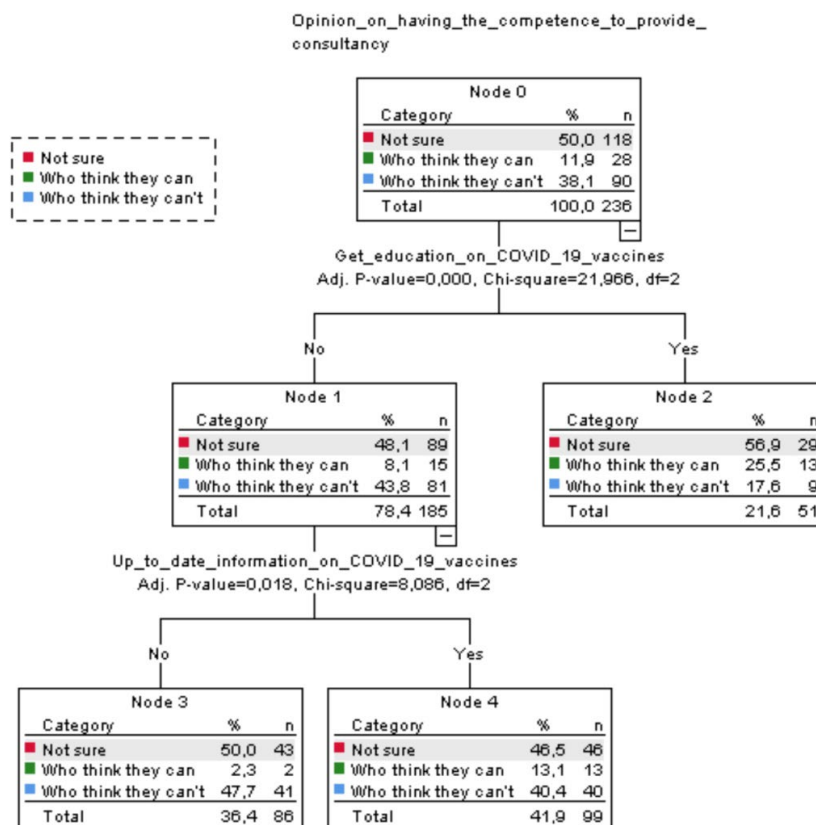
Figure 3. Distribution of variables affecting students' opinion on counselling competency according to the decision tree model

Discussion

This study holds great significance as it is the initial examination aimed at assessing the various factors that impact the attitudes of nursing and midwifery students towards recommending the COVID-19 vaccine to women of reproductive age. Additionally, it emphasizes the importance of students acquiring knowledge and counseling abilities in this particular area.

It has been reported that the proportion of women in their reproductive years who are willing to receive the COVID-19 vaccine is lower compared to the overall population. It is of utmost importance for these women to receive guidance and recommendations from healthcare professionals, not only regarding the COVID-19 vaccine but also in relation to other vaccines developed during this period. This support is crucial to ensuring their informed decision-making and overall well-being.[1,14,15]

Nevertheless, students, similar to other healthcare practitioners, exhibit a low inclination towards considering the endorsement of the COVID-19 vaccine for women who are pregnant, breastfeeding, or intending to conceive.[7,8,16]

In Bradfield et al.'s investigation, the proportion of midwifery students advocating for the COVID-19 vaccine among individuals planning pregnancy and expectant mothers was comparable to the current study (17.9%–28.6%, respectively), while the proportion of those who expressed their reluctance (39.3%–35.7%) was higher.[7] The decline in the proportion of individuals not recommending the vaccine could be attributed to the mounting evidence regarding its efficacy and safety throughout the span of a year. Although no further

research involving students has been published, studies involving other healthcare professionals in prenatal care indicate that obstetricians and medical practitioners prescribe COVID-19 vaccination at a higher rate than midwives and nurses.[7,8,16] In the present study, there is no disparity in the vaccination recommendation status between nursing and midwifery students. It is heartening to observe that the percentage of students in both groups who stated they would never suggest vaccination to any woman of reproductive age is minimal.

Strong recommendations for vaccination from healthcare professionals can have a significant impact on immunization rates among women of reproductive age.[1,14,15] However, there are various factors that influence healthcare professionals' recommendations for vaccination for their patients. Consistent with existing literature, our study found that students who had previously received the influenza vaccine were 1.8 times more likely to recommend vaccination.[13] It is widely acknowledged that a positive attitude towards vaccinations, especially COVID-19 vaccines, can greatly influence vaccination recommendations.[8,17] Similarly to previous research, although students who have a positive attitude towards the COVID-19 vaccine tend to recommend vaccines at a higher rate, it is evident that a positive attitude alone is not sufficient for vaccine advocacy. Lack of training on the subject reduces the likelihood of recommending vaccines, while believing in one's counseling competence increases the likelihood by 2.8 times. Based on the literature and our study's findings, it is crucial to enhance students' counseling skills and improve the dissemination of information regarding vaccinations.

To effectively counsel women of reproductive age, students must possess specialized knowledge and counseling skills.[13,18] However, a significant number of students in the current study admitted that they lacked the qualifications to provide counseling on vaccines and were unable to recommend them to these groups due to insufficient knowledge. It has been documented in the literature that midwives and nurses who are well-informed about vaccines during the reproductive period and have received proper training are more inclined to offer advice

and recommend vaccines, although the authority and resources for prescribing and administering vaccines may vary by country.[19,20] According to the findings of the present study, a mere 20% of the students reported undergoing COVID-19 vaccination training. Consistent with the existing literature, it was observed that those students who had not received such training were less likely to be advised to get vaccinated. To enhance their knowledge and confidence in providing consultations, it is suggested that nursing and midwifery curricula incorporate education on vaccinations, including those relevant to reproductive age and specifically COVID-19 vaccines.[17,18]

The acquisition of knowledge and the ability to apply it effectively are crucial elements in the advancement of counseling competency. According to the study's findings, competency in counseling is directly connected to having proper training and remaining up-to-date on current information, which is consistent with previous research.[18,21] To foster the development of vaccine counseling skills, it is beneficial to devise concise interventions that address the underlying causes of vaccine instability in women of reproductive age. Additionally, instructing students on the utilization of motivational interview techniques and providing them with opportunities to practice their skills through simulated patient interactions or role-playing exercises prior to engaging in real-world scenarios can significantly contribute to their growth in this area.[19,21] It is imperative for students to stay abreast of the latest information; however, in the rapidly evolving landscape of information dissemination and the prevalence of an infodemic environment during the pandemic era, it may be challenging for students to access reliable and well-substantiated resources. As a result, it is crucial to teach students how to critically assess and synthesize material, allowing them to create guides and research findings that are backed by a high degree of evidence.

Pregnant and nursing women frequently refuse the COVID-19 vaccination owing to worries about its safety, effectiveness, potential damage to the newborn, and fear of negative side effects.[14,15] These worries are shared by healthcare professionals who care for women of

reproductive age. The belief that vaccines may not be safe for this particular group, the potential harm they may cause to the baby, and the lack of sufficient research results for pregnant women all contribute to the hesitancy in recommending vaccines.[7,8,17] Similarly, our findings indicate that students also face a similar situation. To address this issue, it is crucial to equip students with up-to-date knowledge on the safety and efficacy of vaccines during the reproductive age. This will enable them to engage in informed discussions with their clients and alleviate their anxieties by recommending vaccines based on reliable information.[8]

Whether or not healthcare professionals have received the COVID-19 vaccine can impact the immunization recommendations they provide to their consumers.[8,16] In the current study, it was found that the vaccination status of the providers did not significantly predict their recommendation for immunization. This could be attributed to the fact that almost all of the students involved in the study had already been vaccinated. While it is encouraging that a large majority of the students received at least two doses of the vaccine, the fact that a significant portion did not receive the booster dose may indicate some level of hesitation.[2] To address this issue, it is important to investigate the reasons behind this hesitancy and provide appropriate counseling and support to the students to prevent the development of vaccine hesitancy.

Given that the study design adopts a cross-sectional research approach, it is important to acknowledge its limitations in terms of making causal inferences. The research sample may not be representative of all students in the country due to the unconventional online sampling procedure employed. Furthermore, as the study exclusively focuses on senior nursing and midwifery students, it becomes challenging to generalize the findings to students studying in different classes. It is worth noting that self-report surveys can introduce information bias. In order to assess students' counseling competencies more objectively, future research should consider evaluating vaccination counseling skills through direct observation or other objective measures rather than relying solely on self-evaluation.

Conclusions

According to the findings of the study, the majority of students had been administered at least two doses of the vaccine. However, despite this, they did not feel confident enough to provide guidance on vaccination and counseling to women who are of reproductive age. The study aimed to evaluate the factors influencing the thoughts of midwifery and nursing students who have completed their education regarding the recommendation of the COVID-19 vaccine to pregnant, breastfeeding, and prospective pregnant women.

The ongoing pandemic has further emphasized the global shortage of nurses, prompting some countries to rely on student midwives and nurses to fill the gap. This situation underscores the importance of providing a well-rounded education to students. Equipped with comprehensive knowledge and counseling skills, midwifery and nursing students can significantly contribute to increasing vaccination rates among women of reproductive age and society as a whole, both in normal and extraordinary circumstances. Therefore, it is recommended to enhance vaccine training prior to graduation in order to address this issue effectively.

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

Abbreviations

Coronavirus disease 2019: COVID-19;
World Health Organization: WHO.

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

The data used in this study are available from the

corresponding author on request.

Ethics approval and consent to participate

To conduct the study, the University Social and Human Sciences Ethics Committee (03.03.2022/74) granted ethical approval. This study was conducted in accordance with the Principles of the Helsinki Declaration.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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