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Original Article

Effect of digitally delivered peer education on nursing and midwifery students' attitudes toward caring for people with HIV and AIDS

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ABSTRACT

This study was designed as a one-group pre-/post-test intervention to examine the effect of peer education delivered via digital media on nursing and midwifery students' attitudes toward caring for people living with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS). The research was conducted with 225 department of nursing and department of midwifery students. In the first phase, two mentors who had previously taken a sexual health course collaborated with researchers to prepare an online educational program. In the second phase, after administering a pre-test via an online platform, mentors shared digital training content with their peers using WhatsApp and subsequently administered a post-test. Data were collected using a socio-demographic data form, the AIDS knowledge scale (AKS), and the AIDS attitude scale (AAS). Descriptive statistics, Pearson's Chi-square test, the paired t-test, the Wilcoxon test were used to analyze the data. After peer education, a statistically significant increase was observed in students' total AKS scores ($p < 0.05$), indicating enhanced knowledge levels. In contrast, their total AAS scores decreased significantly ($p < 0.05$), suggesting reduced negative attitudes toward individuals living with HIV/AIDS. Peer education delivered in a digital environment has been identified as an effective method for improving knowledge and attitudes toward HIV and AIDS.

Keywords: attitude, HIV infections, knowledge, midwifery, students, nursing, peer group

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS), caused by the human immunodeficiency virus (HIV), is a chronic disease transmitted primarily through sexual contact, blood, and from mother to child during pregnancy or delivery, continuing to pose a significant public health threat worldwide [1]. HIV and AIDS remains a major infectious disease internationally. Its rising prevalence in both Türkiye and elsewhere underscores the need for healthcare professionals to improve their knowledge and attitudes related to this condition [2]. Nursing and midwifery students play a critical role in caring for individuals living with HIV/AIDS, as they are in direct interaction with these patients. However, the literature indicates that these students often lack sufficient knowledge, display reluctance to provide care, and exhibit negative attitudes toward HIV and AIDS [3].

Prejudice and stigmatization related to HIV and AIDS can hinder the effectiveness of healthcare professionals, including nurses and midwives, in delivering services to people living with the disease. Therefore, it is crucial that students in these fields receive comprehensive training to ensure a positive attitude and a professional approach to patient care. In this context, peer education programs offered through digital platforms have emerged as a useful tool to increase HIV and AIDS knowledge and improve attitudes among students [4]. Although significant progress has been made in HIV treatment in recent years, studies still show that people living with HIV experience notable stigma, particularly in low- and middle-income countries, where public awareness of HIV remains limited [5]. Negative attitudes toward HIV-positive individuals also extend to healthcare professionals in training. Student nurses and midwives represent a potential workforce to provide equitable and respectful healthcare to people living with HIV and AIDS; however, gaps in knowledge, reluctance, and fear can lead to negative attitudes, including homophobia and stigmatization [3, 6, 7].

Lui et al. [8] reported that many medical and nursing students expressed fear of individuals with AIDS and routinely wore gloves. Similarly, in Europe, nursing students reported fears of contracting HIV during clinical practice [9]. Another study found that although 79.5% of nursing and midwifery students had general knowledge about AIDS, nearly 60.0% were unwilling to care for people living with AIDS [10]. In Türkiye, research has shown that nursing students hold negative attitudes toward people living with HIV [11]. Despite efforts in nursing education, some nurses remain fearful and tend to avoid these patients [12]. Investigating the underlying causes of fear among student nurses and midwives, providing them with accurate, up-to-date information, and developing novel educational interventions could improve both the care provided to patients and the overall quality of service.

Peer education is recognized worldwide as a core strategy for HIV prevention. Peer education has been used in nursing education for many years and has proven effective in improving knowledge and promoting attitudes and behaviour change. Moreover, evidence suggests that peer education programs can be beneficial not only for health science students but also for other groups, such as middle school students, in enhancing knowledge and positive attitudes toward HIV and AIDS [13]. With the widespread use of digital communication tools, young people frequently and effectively use these applications, making online platforms an excellent avenue to reach more participants. Improving and expanding online teaching approaches provides broader access to education [14]. Digital peer education offers additional advantages, such as flexibility, accessibility, and the ability for students to learn at their own pace, supplementing traditional teaching methods.

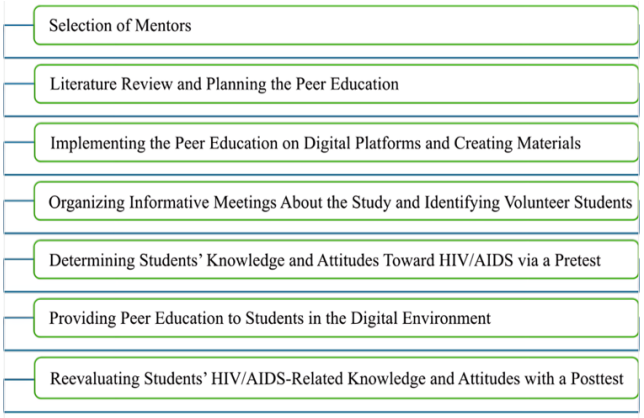

Figure 1. Flowchart of the study (Source: Authors)

Thus, this study was designed as a one-group pre-/post-test intervention to investigate how peer education delivered via digital media affects nursing and midwifery students' attitudes toward caring for people living with HIV and AIDS.

METHODS

Study Design and Setting

This intervention study was conducted as a one-group pre-/post-test design between September 16 and November 29, 2023, among 225 students enrolled in the department of nursing and department of midwifery at Amasya University. Students were eligible to participate if they were nursing or midwifery undergraduates who had already started clinical practice, provided informed consent, and were capable of independently completing the online questionnaires. The study flowchart is presented in **Figure 1**.

The study population comprised all students registered in the department of nursing and department of midwifery during the academic years 2023-2024. Power analysis was performed to determine the sample size, assuming an effect size of 0.50, 5.0% margin of error, and 80.0% power. The required sample size was calculated as 64. However, anticipating potential attrition, all students were invited to participate. Finally, 225 students completed the study.

Data Collection Tools

Socio-demographic questionnaire

A socio-demographic form was developed by the researchers based on the existing literature [10, 15, 16] to gather information on participants' demographic characteristics and attitudes toward HIV and AIDS.

AIDS attitude scale

Originally developed for medical and nursing students [15], the AIDS attitude scale (AAS) was adapted into Turkish [16]. This 15-item instrument uses a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree). Thirteen items were scored positively, while item 2 and item 8 were reverse-scored. The total scores range from 15 to 90, with higher scores indicating more negative attitudes toward HIV/AIDS. This scale has three subscales:

1. Fear of contagion (items 1-5; score range 5-30)
2. Negative feelings (items 6-9; score range 4-24)
3. Professional resistance (items 10-15; score range 6-36)

In the original study, Cronbach's alpha was 0.80; in this research, it was 0.82, suggesting strong internal consistency.

AIDS knowledge scale

The AIDS knowledge scale (AKS) comprises 21 items covering three dimensions [17]:

1. Transmission routes (7 items)
2. Prevention and general knowledge (9 items)
3. Treatment (5 items)

It used a three-point response format (true = 1, false/unsure = 0). Items 4, 5, 7, 9, 10, 12, 13, 14, 15, 16, 17, and 19 are reverse-scored. Higher total scores indicated greater knowledge of HIV/AIDS. The scale's reliability was 0.76 at development; in the present study, Cronbach's alpha was 0.70.

Digital Peer Education Program and Data Collection

Digital peer education program

Peer education on HIV and AIDS was delivered to department of nursing and department of midwifery students through digital platforms. The primary goal was to provide comprehensive information on topics such as routes of transmission, prevention measures, and treatment options for HIV/AIDS while improving attitudes toward caring for individuals living with HIV and AIDS. Because students regularly use digital platforms, this mode of delivery was selected to enable easy access to educational materials at any time and accommodate varying learning paces.

A Zoom-based lecture was recorded by mentors—students who had received formal instruction on HIV/AIDS and other sexually transmitted infections—and the researchers. The presentation, featuring PowerPoint slides, was then shared via a WhatsApp group, allowing participants to ask questions, exchange views, and seek additional information. The interactive digital approach aims to enhance both engagement and learning.

Implementation process

In the first stage, mentors (trained in HIV and AIDS and other sexually transmitted infections) worked with researchers to develop an online HIV and AIDS education program. After finalizing the training materials, the researchers administered a pre-test (AKS and AAS) using Google Forms. Next, mentors shared the prepared content on WhatsApp, encouraging participants to interact with the materials and ask questions. Finally, the same scales were administered as a post-test one month later. Data from these pre-tests and post-tests were analyzed to evaluate changes in students' knowledge and attitudes.

Data Analysis

All statistical analyses were performed using the IBM SPSS Statistics 22. Descriptive statistics (frequency, percentage, mean [M], median, minimum, maximum, and standard deviation [SD]), Pearson's Chi-square test, paired sample t-test, and the Wilcoxon test were used. The Shapiro-Wilk test was used to check the normality of the distribution. The frequencies of variables before and after the intervention were compared using the chi-square test. The Wilcoxon and paired sample t-test were used to determine significant differences in the scale and subscale scores before and after education. A $p < 0.05$ was considered statistically significant.

RESULTS

The mean age of the students was 20.52 ± 3.19 years, and the majority were female. Most participants (84.4%) reported living in a nuclear family, whereas 69% stated their income was lower than their expenses. In addition, 47.6% indicated that their mothers had completed primary school or less (**Table 1**).

A total of 77.0% of the students reported having received information about HIV and AIDS prevention, most

Table 1. Socio-demographic characteristics of the students

Variables	n	Percentage (%)
Age (M): 20.52 ± 3.19		
Gender		
Female	194	86.2
Male	31	13.8
Department and year level		
Nursing		
1st year	34	15.0
2nd year	60	27.0
3rd year	80	35.0
4th year	13	6.0
Midwifery		
1st year	22	10.0
2nd year	16	7.0
Place of longest residence		
City	116	51.5
Town	76	33.8
Village	33	14.7
Living arrangements during university		
Home	29	12.9
Dormitory	196	87.1
Family type		
Nuclear	190	84.4
Extended	35	15.6
Father's education level		
Primary school or less	59	26.2
Middle school	56	24.9
High school	70	31.1
Undergraduate	38	16.9
Graduate	2	0.9
Mother's education level		
Primary school or less	107	47.6
Middle school	56	24.9
High school	44	19.6
Undergraduate	17	7.6
Graduate	1	0.4
Income status		
Less than expenses	156	69.3
Equal to expenses	43	19.1
More than expenses	26	11.6
Total	225	100

commonly from their school. Only 4.4% stated that they had ever cared for patients with HIV/AIDS. Regarding concerns about caring for an HIV and AIDS patient, the greatest concern was the risk of transmission (64.4%), followed by the possibility that the patient might hide their illness (26.7%) and the fear of harming the patient (8.9%) (**Table 2**).

After receiving peer education in the digital environment, the students' total scores on the AAS decreased significantly ($p < 0.05$), indicating a reduction in negative attitudes

Table 2. Students' HIV/AIDS-related knowledge and attitudes

Variables	n	Percentage (%)
Received information about HIV/AIDS prevention methods		
Yes	173	76.9
No	52	23.1
Sources of information		
The Internet	28	12.4
Family	33	14.7
School	149	66.2
Magazine/newspaper	1	0.4
Other	14	6.3
Knowing someone with HIV/AIDS		
Yes	2	0.9
No	223	99.1
Provided care to an HIV-positive patient		
Yes	10	4.4
No	215	95.6
Concerns when caring for HIV/AIDS patients		
Disease transmission	145	64.4
Hurting the patient	20	8.9
Disease being concealed	60	26.7

(**Table 3**). In particular, concerns about disease transmission and professional resistance subscale scores dropped significantly ($p < 0.05$), although some residual fears of contagion persisted.

Table 4 shows a statistically significant increase in the AKS total and subscale scores after the intervention ($p < 0.05$), suggesting that students' understanding of HIV/AIDS transmission, prevention, and treatment improved.

DISCUSSION

The present study examined the effects of a digital peer education intervention on nursing and midwifery students' attitudes toward caring for individuals living with HIV and AIDS. Prior to the intervention, most students had basic awareness of HIV and AIDS; however, fear of transmission and stigma led to reluctance to provide care. This finding is consistent with that of [8], who reported that nursing and medical students commonly express fear when interacting with HIV-positive individuals, often resorting to protective equipment use beyond standard precautions.

Our results demonstrate that digital peer education effectively enhanced both knowledge and attitudes, aligning with previous research indicating that digital platforms can serve as valuable tools for active learning [4, 9]. Post-intervention, there was a statistically significant improvement in scores on both the AKS and the AAS, suggesting that students felt more confident and displayed less negative bias toward those living with HIV/AIDS. These

Table 3. Significance test results of the difference between pre- and post-test mean total scores and subscale scores of the AAS (p is significance & Wilcoxon test was used)

Variables	Pre-test: M ± SD	Post-test: M ± SD	Test statistics	p
AAS total score	37.54 ±14.77	33.45 ± 13.27	**3.35**	**0.001***
Fear of contagion subscale score	17.8 ± 4.45	17.00 ± 5.51	**1.90**	**0.006***
Negative emotions subscale score	12.88 ± 3.64	12.25 ± 3.80	**1.31**	**0.189**
Professional resistance subscale score	17.70 ± 6.72	16.45 ± 7.22	**2.16**	**0.032***

Table 4. Significance test results of the difference between pre- and post-test mean total scores and subscale mean scores of the AKS (p is significance; [a]Paired sample t-test; & [b]Wilcoxon test was used)

Variables	Pre-test: M ± SD	Post-test: M ± SD	Test statistics	p
AKS total score	9.30 ± 3.40	9.94 ± 2.88	**-2.08**	**0.039***
Modes of transmission subscale score	2.97 ± 1.82	3.96 ± 2.26	**5.30**	**<0.001***
Prevention and general knowledge subscale score	5.56 ± 2.18	6.83 ± 1.62	**6.93**	**<0.001***
Treatment subscale score	1.74 ± 1.22	2.13 ± 1.34	**3.03**	**0.003***

findings mirror broader literature that highlights the benefits of interactive and accessible digital learning environments, especially in the wake of the COVID-19 pandemic [2, 10].

In this study, the total AAS score significantly decreased from a pre-test mean of 37.54 ± 14.77 to a post-test mean of 33.45 ± 13.27. Higher scores on this scale signify more negative attitudes; therefore, the decline reflects a notable shift in the positive direction. In contrast, other Turkish research has reported higher average scores (e.g., 48.80 ± 12.50), indicating more negative attitudes [16]. This difference may stem from evolving social perspectives, broader knowledge resources available to students, or the effectiveness of modern educational interventions.

Consistent with previous findings in Türkiye [11], many nursing students, despite having basic knowledge, still exhibit negative attitudes toward individuals living with HIV and AIDS. The results of our study suggest that digital education can be used extensively to mitigate these attitudes.

CONCLUSION

Digital peer education was found to be an effective method for increasing nursing and midwifery students' knowledge of HIV/AIDS and fostering more positive attitudes toward individuals living with this condition. This approach facilitates broad access to up-to-date resources and promotes interactive learning, enabling students to develop greater empathy and reduce stigma. By integrating digital peer education into standard curricula, schools can offer an adaptable, far-reaching, and student-centered approach to HIV/AIDS education.

Given the benefits observed, future research should focus on applying this intervention to a wider range of institutions with larger sample sizes to assess its long-term impact. Moreover, additional studies are recommended to investigate how improved knowledge and attitudes translate into actual clinical practice, patient outcomes, and a broader healthcare environment.

Limitations

A key limitation of this study is the one-group pre-/post-test design, which does not allow for comparisons with other control conditions or interventions. In addition, the research was conducted at a single university, which restricts its generalizability. Similar studies at different universities and in diverse contexts are needed to strengthen external validity. Another limitation is the overrepresentation of women in the sample—a common occurrence in nursing and midwifery programs. Despite these constraints, this study highlights the potential advantages of digital peer education in nursing and midwifery training and provides a foundation for future work in this area.

Author contributions: ŞKE: conceptualization, methodology, investigation, project administration, writing – original draft, writing – review & editing; **ŞÇ:** methodology, formal analysis, writing – review & editing; **MÇ:** conceptualization, resources, validation, writing – review & editing; **FD:** investigation, data curation. All authors have read and approved the final version of the manuscript.

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Ethical statement: The authors stated that the study was approved by the Social and Humanities Ethics Committee at Bartin University on 18 August 2023 with approval number 2023-SBB-0445. Additionally, written institutional permission to conduct the study with nursing and midwifery students was obtained from Amasya University Faculty of Health Sciences Dean's Office. Written informed consent was obtained from each participant. Because Amasya University did not have an active ethics committee at the time of application, ethical approval was

obtained from the Social and Humanities Ethics Committee of Bartin University.

AI statement: The authors declared that no generative AI or AI-based tools were used in the conception, design, data collection, analysis, or writing of this manuscript.

Declaration of interest: Authors declare no competing interest.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the corresponding author.

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