Effect of applying an Instructional System Design Model on Knowledge, Attitude and Satisfaction regarding Vaginal Infections among Female University Students

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Abstract

Background: Vaginal infections are common; many university students lack adequate awareness and hold misconceptions that hinder proper prevention and self-care. Systematic, well-designed educational interventions are essential to improve health knowledge and promote effective self-care practices. **The aim of this study was** to evaluate the effect of applying an instructional system design model on knowledge, attitude and satisfaction regarding vaginal infections among female university students. **Research Design:** A quasi-experimental study research design (one-group pre–post-test) was used in order to accomplish the aim of this research. **Setting:** The study was conducted at Kafer-El-Sheikh University, which contains 5 theoretical faculties, Egypt. **Research sample**: A multistage random sampling technique was used, involving 291 female students. **Tools of data collection:** Four tools were used: Tool I a structured self-administered questionnaire, personal characteristics, medical and menstrual history and students' knowledge questionnaire regarding vaginal infections. Tool II reported self-care practices. Tool III attitude assessment scale. Tool IV: satisfaction assessment scale. **Results:** Findings revealed that following the implementation of the instructional system design model, students demonstrated marked improvements across all outcomes of knowledge, self-care practices, attitudes, and satisfaction levels ($p < 0.001$) further confirm the model's impact, highlighting its effectiveness in supporting preventive behaviors and improving overall educational quality. **Conclusion:** Applying the instructional system design model proved effective in enhancing university students' knowledge, attitudes, and self-care practices regarding vaginal infections. And satisfaction with the educational sessions and teaching methods. **Recommendations:** Integrate the instructional system design model into university health education curricula.

Keywords: Attitude, Instructional System Design Model, Knowledge, Satisfaction, Vaginal infections, University students.

Introduction:

Vaginal infections represent one of the most prevalent gynecological concerns among women of reproductive age, significantly influencing their physical health, psychological well-being, and overall quality of life **(Alam et al., 2022; Worku et al., 2023).** These infections, including bacterial vaginosis, vulvovaginal candidiasis, and trichomoniasis, are primarily associated with disruptions in the vaginal microbiota, poor genital hygiene practices, and risky sexual behaviors (**Begum et al., 2021).** Globally, the World Health Organization **(WHO, 2022)** estimates that millions of women experience recurrent vaginal infections annually, often leading to discomfort, stigma, reproductive complications, and increased susceptibility to

other Sexually Transmitted Infections (STIs). Despite their high prevalence, awareness, and understanding of vaginal infections remain limited among young women, particularly university students, who are at a transitional stage characterized by newfound independence, curiosity about sexual and reproductive health, and potential exposure to misinformation **(Abdallah et al., 2023).**

University students represent a crucial target group for preventive and educational health interventions. Many studies indicate that this population often exhibits inadequate knowledge and misconceptions regarding reproductive health, including vaginal infections and hygiene practices **(Mahmoud and Hassan 2024**). Such gaps in understanding may contribute to delayed diagnosis, inappropriate self-treatment, and persistent infection cycles **(Shiferaw et al., 2020).** In addition, cultural taboos and embarrassment surrounding discussions of genital health further hinder students from seeking reliable information or professional care **(Nwagwu et al., 2022).** Thus, there is an urgent need for comprehensive, evidence-based educational programs that not only increase knowledge but also foster positive attitudes and satisfaction toward preventive health practices.

Instructional System Design (ISD) Model: The ISD model, widely represented through the ADDIE framework comprising Analysis, Design, Development, Implementation, and Evaluation, offers a systematic process for ensuring that educational programs are evidence-based, relevant, and tailored to learners' needs **(Molenda, 2021).** In the Analysis phase, learners' characteristics, prior knowledge, and learning needs are identified. The design and development stages focus on formulating clear learning objectives, selecting instructional strategies, and preparing materials. During Implementation, the educational intervention is delivered, while the Evaluation stage assesses outcomes and informs future improvements **(Branch, 2022).**

Applying the ISD model to health education enables educators to create structured, learner-centered interventions that integrate content accuracy with effective delivery methods. Studies in nursing and public health education have demonstrated that ISD-based interventions enhance learners' understanding, engagement, and satisfaction across diverse health topics, including reproductive health, chronic disease prevention, and patient safety **(Hassan & Ghoneim, 2020).** This model ensures the alignment between educational objectives, instructional activities, and evaluation methods, resulting in improved knowledge retention and attitudinal change **(Lee et al., 2023).**

Educational interventions concerning vaginal infections have primarily focused on improving knowledge about causative factors, preventive hygiene, and treatment adherence **(Gebremedhin et al., 2021).** However, evidence suggests that the success of such programs largely depends on how effectively the content is designed and delivered. Interactive, learner-focused approaches have been shown to promote better understanding and positive behavioral outcomes compared to traditional, passive instruction **(El-Kholy et al., 2020**). For example, health education programs guided by systematic instructional design have improved young women's reproductive health literacy, confidence in managing personal hygiene, and willingness to seek professional help when necessary **(Abdallah et al., 2023).**

Given that university students are in a critical developmental period for forming lifelong health behaviors, interventions that not only increase knowledge but also shape positive attitudes are essential **(Mahmoud and Hassan 2024).** Furthermore, evaluating participants' satisfaction provides insights into the acceptability and perceived usefulness of the educational program, which are key indicators of sustainability and long-term effectiveness **(Rosen et al., 2022).**

In Egypt and other Middle Eastern contexts, cultural sensitivities surrounding reproductive health often restrict open discussion and access to credible information among young women **(Al-Dahshan et al., 2022).** Implementing an ISD-based educational program on vaginal infections within university settings may therefore provide a culturally appropriate and pedagogically sound method to enhance female students' health literacy, attitudes, and satisfaction toward learning about such sensitive topics. Nurses play a critical part in preventing situations that lead to gynecological infections and in finding out wrong hygiene habits and determining the correct practices. The nurses can undertake the role of health educator and mentor through proper approaches in identifying and resolving gynecologic problems **(Ojha et al., 2025).**

Significance of the Study:

Vaginal infections are highly prevalent among women of reproductive age, including university students, yet they often remain underreported due to embarrassment, stigma, and limited awareness. Insufficient knowledge contributes to poor health-seeking behavior, delayed diagnosis, and recurrent infections that may lead to complications such as pelvic inflammatory disease, infertility, and psychological distress **(Enwa et al., 2022).**

Globally, one-third to one-half of female university students experience vaginal infections during their academic years, underscoring the need for structured health education. In Egypt, studies show a prevalence of 40–50%, with common conditions such as bacterial vaginosis and vulvovaginal candidiasis **(Rezk & Alqabbasi, 2023)**.
A systematic review by **Worku et al. (2023**) estimated the global prevalence of vaginal infections among young adult women at 40–60 %, with bacterial vaginosis ranging between 25–35 %, vulvo-vaginal candidiasis about 20–30 %, and trichomoniasis around 5–8 %.

Research by **El-Kholy et al. (2020) and Abdel-Aziz et al. (2022)** highlights gaps in awareness, hygiene practices, and medical care-seeking behaviors. These findings underscore the importance of reproductive health literacy programs. The current study gains significance by applying the Instructional System Design model, specifically the ADDIE framework, to create a systematic and learner-centered educational intervention. This approach ensures evidence-based content tailored to students' needs, enhances engagement, and improves knowledge retention. Ultimately, it supports preventive behaviors and promotes reproductive well-being among university students.

Aim of the study:

The aim of this study was to evaluate the effect to evaluate the effect of applying an instructional system design model on knowledge, attitude and satisfaction regarding vaginal infections among female university students.

The aim was achieved through:

1. Assess the level of knowledge, self-care practices and attitude regarding vaginal infections among university students before

the implementation of the ISD-based educational program.
2. Design and implement an educational program on vaginal infections guided by ISD.
3. Evaluate the effect of the ISD-based educational program on students' knowledge, self-care practices and attitude toward vaginal infections.
4. Determine students' satisfaction with the ISD-based educational program.

Research hypotheses:

H1: University students who receive educational program based on the instructional system design model will demonstrate significantly higher knowledge scores and self-care practices regarding vaginal infections after the intervention than before.

H2: University students who receive educational program based on the instructional system design model will show a positive attitude toward vaginal infection prevention after the intervention than before.

H3: University students who receive educational program based on the instructional system design model will report a high level of satisfaction after the intervention than before.

Subjects and method:

Research design:

A quasi-experimental study design (pre/ posttest, one group) was utilized to achieve the aim of the study. Quasi-experimental design refers to pre-post intervention designs and is often used to explore causal relationships. Quasi- experimental may lack the randomization and/or the comparison group characteristics of true experiments **(Maciejewski, 2020).**

Research setting:

The study was conducted at Kafer-El-Sheikh University, which contains 5 theoretical faculties. These select the faculty of art.

Sample:

A multistage random sampling technique was used to select participants from the Colleges at Kafr El-Sheikh University. The sampling process consisted of three stages.

First stage: Among the five theoretical faculties at Kafr El-Sheikh University, 60% (three faculties) were included in the study to ensure adequate representation.

Second stage: The selected faculties were chosen randomly. The total number of first-year students in these faculties was as follows: Faculty of Archaeology (86 students), Faculty of Journalism (150 students), and Faculty of Arts (1,800 students).

Third stage: Chosen from the Faculty of Arts, first-year students were selected to participate in the study. This faculty was chosen due to the higher proportion of female students (1,200 females and 600 males) and because none of the students had previously received formal education related to reproductive health.

This multistage random sampling method enhanced the representativeness of the sample while ensuring feasibility and efficiency in data collection.

Sample Size:

The sample size was calculated using the following formula:

$$n=\frac{NZ^2rq}{Nd^2+Z^2rq}$$

where $N=1200$, $Z=1.96$, $r=0.5$, $q=0.5$, and $d=0.05$.

Substituting the values yields:

$$n=\frac{1200(1.96)^2(0.5)(0.5)}{1200(0.05)^2+(1.96)^2(0.5)(0.5)}=291$$

Therefore, the minimum required sample size was **291 students**. However, to increase precision and account for potential non-response, the actual sample consisted of **1200 students** during the academic year 2024–2025.

Tools of data collection:

Four tools used for data collection:

Tool I: A structured self-administered Questionnaire: It constructed by the researchers after reviewing related literature; it included three parts:

Part I: Personal characteristics: It included 5 items such as, age, marital status, residence, monthly income, and place of residence during studying

Part II: Medical and menstrual history: It consisted of (10) questions, including the age of menarche, regularity of menstrual cycle, duration of menstruation, suffering from any menstrual disorders, suffering from pain accompanying menstruation, methods used to relieve menstrual pain, suffering from any diseases, history of previous urinary tract infection, history of previous vaginal infections and frequent occurrence of vaginal infections.

Part III: Students' knowledge questionnaire regarding vaginal infections: This tool was developed by the researchers after reviewing relevant literature **(Shelke & Vidyapeeth, 2020).** The knowledge component comprised 7 domains, designed to assess students' understanding of knowledge regarding vaginal infections such as anatomy of the female genital system, characters of vaginal discharge, meaning of vaginal infection, the causes and risk factors, signs and symptoms, prevention and control of vaginal infection and self -care measures for prevent and control of vaginal infection).

Scoring system: One (1) point was awarded for each correct response, while incorrect or "don't know" answers were assigned a score of zero (0).

Total score: The cumulative knowledge score ranged from 0 to 25.

- Good knowledge: >75% (19–25 points)
- Fair knowledge: 50–75% (13–18 points)
- Poor knowledge: <50% (0–12 points).

Tool II: Reported self-care practices questionnaire

The researchers designed this tool after reviewing the relevant literature **(Fisher & Yates, 2021)** to assess the students' reported self-care practices related to the prevention and management of vaginal infections. It aimed to evaluate the extent to which female university students adopt appropriate hygienic and preventive behaviors in their daily lives.

The questionnaire consisted of 5 statements with total 60 items of all reported self-care that covering the following main domains:

1. **Personal hygiene practices**, it consisted from 9 items.
2. **Menstrual hygiene practices,** it consisted from 12 items**.**
3. **Preventive health practices**, it consisted from 10 items.
4. **Health-seeking behavior,** it consisted from 18 items.
5. **Daily habits,** it consisted from 11 items.

Each item was rated on a **two-point scale** reflecting the frequency of practice:

- Done (1 point)
- Not done (0 points)

The **total score** ranged from **0 to 60**, with higher scores indicating better self-care practices related to vaginal infection prevention.

The total scores were categorized as follows:

- **Satisfactory:** ≥ 30 points (50–100%)
- **Unsatisfactory:** < 30 points (< 50%)

Tools III: Attitude Assessment Scale

Following the framework proposed by **El-Naggar and Abdel-Rahman (2019)**, students' attitudes toward vaginal infections and preventive behaviors were evaluated using a Likert-type scale consisting of three subscales addressing beliefs, perceptions, and attitudes related to prevention and self-care.

- **Response format:** Each statement was rated on a **three-point scale**: Agree (3), Uncertain (2), and Disagree (1).
- Total score: Possible scores ranged from 15 to 45.
  - Positive attitude: ≥50% (23-45 points)
  - Negative attitude: <50% (15- 22 points)

Tools IV: Satisfaction assessment scale:

In accordance with **Al-Qahtani and Al-Ghamdi (2020)**, students' satisfaction with the implemented educational program was evaluated post-intervention using a **10-items satisfaction questionnaire** adapted from established instructional evaluation frameworks. The academic program met my learning expectations. The teaching methods used were effective. The course content was relevant and useful. The learning materials were clear and easy to understand. The instructor's explanations were clear. The program encouraged active participation. The assessment methods were fair and appropriate. The program improved my knowledge and skills. The overall organization of the program was effective, and I am satisfied with the overall quality of the program.

- **Response format:** Each item was rated on a three-point Likert scale: strongly agree (3), Agree (2), and strongly disagree (1).
- **Total score:** The overall satisfaction score ranged from **10 to 30**.
  - High satisfaction: ≥75% (23–30 points) of the total score
  - Moderate satisfaction: 50–74% (15–22)
  - Low satisfaction**:** <50% (10–14)

Validity and Reliability:

The tools were reviewed by a panel of five experts in maternal and newborn health nursing to assess content validity, clarity, and relevance. Necessary modifications were made based on their feedback. Reliability was tested using Cronbach's alpha coefficient, which revealed high internal consistency:

- Knowledge questionnaire: $\alpha = 0.87$
- Reported self-care practices scale: $\alpha = 0.86$
- Attitude assessment scale: $\alpha = 0.83$
- Satisfaction assessment scale: $\alpha = 0.89$

Ethical Considerations:

Ethical approval for conducting the study was obtained from the Ethical Committee of the Faculty of nursing, Kafr El-Sheikh University prior to data collection. Official permissions were also secured from the administrative authorities of the selected faculties to facilitate access to the students. The purpose and procedures of the study were clearly explained to all participants before their enrollment. Each participant was informed about her right to refuse participation or withdraw from the study at any time without any penalty or loss of benefits. **Informed consent** was obtained from all participants after clarifying that participation was entirely voluntary. Confidentiality and anonymity were strictly maintained throughout all stages of the research. Participants were assured that their responses would be used solely for scientific research purposes and would remain confidential. To protect privacy, no identifying information was included in the questionnaire.

Administrative Design:

Before conducting the study, formal administrative approvals were obtained from the Dean of the Faculty of Art, Kafr El-Sheikh

University, as well as from the administrative authorities of the selected faculty involved in the research. An official letter describing the purpose, objectives, and significance of the study was submitted to each faculty to secure permission for data collection. Coordination with class coordinators and instructors was made to facilitate communication with students and to organize appropriate times for questionnaire distribution and implementation of the educational sessions.

The study was carried out in full cooperation with the Faculty administration to ensure smooth execution of all stages, including recruitment, data collection, and educational intervention.

Pilot study:

A pilot study was conducted prior to data collection to assess the feasibility, clarity, and applicability of the developed tools and procedures. It involved 10% (29 students) of the total sample, selected randomly from the same setting but excluded from the main study sample to prevent contamination of results. The objectives of the pilot study were to: Evaluate the clarity and relevance of questionnaire items. Determine the time required to complete the tools. Identify any potential ambiguities or difficulties in understanding the questions. Test the logistics and practicality of the data collection process.

Based on the pilot results, minor modifications were made to the wording of some items to enhance clarity and comprehension. The pilot study also confirmed the feasibility of the research design and the adequacy of the data collection tools for achieving the study objectives.

Field of work:

The researchers were visited the previously mentioned study setting (Faculty of Arts at Kafr El-Sheikh University, Egypt) 3 days/week Saturday, Tuesday, Thursday from 9 Am to 3 Pm and data collection extended from September 2025 to December 2025 covering 4 months. The researchers were explained the aim of the study research to the administration team such as (Dean of faculty education, Vice dean for graduate studies then students' affairs) and took permission to conduct the study and took menu of the female student's names. The study was conducted at the previously mentioned study setting through five phases included preparatory, interviewing and assessment, planning, implementation and evaluation phases.

A. Preparatory phase:

A review of the past and current literature covering all aspects helpful in designing and processing of data collection tools were available books, Journals, Internet and articles.

B. Interviewing and assessment phase:

At the beginning of the interview the researchers were greeted with the female students and presented themselves to each the participant involved in the study, the researchers were explained the purpose of the study research and provided the female students with all information about the study research to gain confidence of the students. The researchers took a written consent from any student to participate in this study. According to Design phase of the instructional system design model, the researchers were determined the tools for data collection and instructional strategies that used for the students were assessed for personal characteristics in the special separate place to maintain the privacy of the students and during this phase the data was collected by the researchers through the distribution of a structured self-administered questionnaire **(Tool. I)** (pretest) to collect female students'

personal characteristics, menstrual history and medical history. The researchers assessed the student level of knowledge regarding vaginal infection by using pre-test students' knowledge questionnaire, and then the researchers informed the students about the time of the post-test and follow up. After that, also the researchers were distributing **(Tool II):** Reported self-care practices questionnaire (Pretest) to assess female's students' self-care practices regarding vaginal infections. Finally, the researchers were distributing **(Tool III)**: Attitude assessment scale to assess the female students' perceptions, and attitudes related to prevention and self-care toward vaginal infections The average time required for completion of the questionnaire was around (20-30 minutes).

C. Planning phase:

Based on baseline data obtained from assessment phase and relevant review of literature, the development phase that included in the instructional system model was applied by the researchers to accommodate the female students' deficit knowledge and preventive behaviors regarding vaginal infections. The researchers designed four sessions and divided it into two theoretical sessions and two practical sessions. The researchers also applied the **development phase** for creating and developing the content of each session and followed the teaching strategies such as discussion the lecture and group dissuasion, brainstorming, demonstration for the content of practical session and uses instructional media such as the instructional booklet in PowerPoint on the laptop, picture of signs and types of vaginal infections, brochure. The development phase of the process can include the integration of E-Learning for delivering instruction and improving attitude. The contents were prepared according to female students' level of understanding.

D. Implementation Phase of the ADDIE model deals with the actual delivery of the content of lectures of vaginal infection to the participant in the study. There are three steps of implementation phase of the ADDIE training process: **firstly**, the researchers carried out through understanding review of local, national and international related literature about this study. This was a guide for the researchers to prepare the required information and increase their understanding of the model content and materials for achieved the goals from application of this model. **Second**, the researchers organize and arranging the studied sample according to the sessions to ensure they have access to the materials and tools they need to complete the program's activities and ensure the expansion of their knowledge to the female student. **Third**, the researchers keep the setting up an environment that is conducive to educate the female student in good and clean ventilated environment and keeps privacy for maintain confidently and trust to all the participating.

The general and specific objectives of instructional system model were stated and implemented to satisfy the actual needs of the studied sample. The study sample included 291 female students. The researchers were classified the study sample into (15) groups for the period of data collection, each group involved approximately (19 -20) female student, then the researchers were illustrating the knowledge and self-care for prevent vaginal infections through theoretical and practical sessions. The duration of each session around 30 to 45 minutes. The researchers were interviewed 19 -20 female student weekly. All these students were attended all sessions according to student's their achievement, progress and feedback. The researchers discussed one session every week according to schedule of lecture. The sessions were carried

out in a well-equipped classroom within the Faculty of Arts.

The researchers discussed the all knowledge related the types of all vaginal infection to the participant in the study through the following sessions:

First theoretical session: Overview of the female reproductive system and common vaginal infections (definition, risk factors, causes, signs and symptoms of vaginal infection).

Second theoretical session: Types of vaginal infection, early detection and prevention of vaginal infections according to each type.

First practical session: Personal hygiene practices, menstrual hygiene practices, daily habits, personal hygiene during menstruation, preventive health practices and daily habits.

Second practical session: Safe reproductive behaviors, health-seeking behavior during vaginal infection, Reinforcement, feedback, and open discussion to clarify misconceptions and summarize key learning points.

Throughout the implementation phase, students were encouraged to ask questions, share experiences, and actively participate. At the end of each session, a brief summary and feedback were provided to reinforce learning. The program delivery adhered to the instructional system design principles, ensuring systematic progression from analysis to evaluation and maintaining continuous learner engagement.

E. Evaluation phase:

Emphasized on determining the effect of instructional system design model on female university students' knowledge, reported self-care practices, attitude regarding vaginal infections by comparing the results pre, post of application of instructional system design model. Post-test was done after one-month from the last session, through schedule of visiting for follow up at Faculty of Arts at Kafr El-Sheikh University, Egypt). In order to test female students' retention of knowledge and improving attitude and satisfaction as indicators of this model. The researchers used tool no. I (part three) (pre-post-test) to assess female students' knowledge regarding vaginal infection. Tool no. II (pre-post-test) to assess reported self-care regarding vaginal infection. Tool no. III (pre-post-test) to assess attitude regarding vaginal infection. Tool no. IV to evaluated the satisfaction of the female student toward instructional system design model on related knowledge and improving attitude and satisfaction. The post-test aimed to measure the degree of improvement in participants' knowledge and attitudes, as well as their level of satisfaction with the educational sessions.

Statistical analysis:

Data was verified before computerized entry. The Statistical Package for Social Sciences (SPSS version 28) was used, followed by data analysis and tabulation. Descriptive statistics were applied (e.g., mean, standard deviation, frequency, and percentages). Also, tests of significance (Chi-square test and Friedman Test) were applied to test the study hypothesis. Pearson correlation coefficients were used to investigate the relationship between scores of knowledge and preventive behavior. A statistically significant level value was considered when ($p \leq 0.05$). A highly statistically significant level value was considered when ($p < 0.001$).

Limitation of this study:

Postponed of some female students due to absenteeism and limited time for some student due to overload from theoretical sessions and lectures, other females complain from common cold, fever. A solution was needed to address this problem by motivation and reinforcement during sessions was used to enhance motivation for sharing in the study.

Results:

Table (1) presents the distribution of university students according to their personal characteristics. Most students were aged 17–19 years (mean 18.75) and mostly 79.4% lived in urban areas. Nearly 98.3% all were single, and most reported insufficient monthly income. The majority, 91.1% lived with the family during study, with few in university housing or with relatives. Overall, the sample consisted mainly of young, single, urban students with financial constraints.

Table (2) shows that most students (82.4%) experienced menarche between 11 and 12 years, indicating an early onset of menstruation. About 70.7% reported regular cycles, while 29.3% had irregular ones. The majority (85.9%) had menstrual durations of 3–<6 days. Although none reported diagnosed menstrual disorders, almost all (96.2%) suffered from menstrual pain, with medication (41.3%) being the most common relief method, followed by massage and relaxation techniques; however, 6.8% had urinary tract infections, and 79.1% reported vaginal infections, occurring monthly in 82.4% of cases.

Table (3) illustrates that there was a highly statistically significant difference between the results of post-intervention phase compared to pre- intervention phase in favor of post- intervention regarding all items of studied sample's knowledge about vaginal infection with ($p \leq 0.001$).

Figure (1) shows that 19.1% of the university students had satisfactory total knowledge scores regarding vaginal infection pre the application of the instructional system design model, which improved to include 80% of them post the application of the instructional system design model. While 80.9% of them had unsatisfactory total knowledge scores regarding vaginal infections before the application of the instructional system design model, this decreased to 20% after the application of the instructional system design model.

Table (4) demonstrates that there was a highly statistically significant difference between the results of post-intervention phase compared to pre- intervention phase in favor of post- intervention regarding all items of studied female university students' reported self-care practices related to the prevention and management of vaginal infections pre and post the application of the instructional system design model with ($P \leq 0.001$).

Figure (2) illustrates a clear improvement in university students' total self-care practice scores following the application of the instructional system design model. Before the intervention, the majority of students demonstrated low levels of self-care practices related to the prevention and management of vaginal infections. After the intervention, there was a substantial increase in the proportion of students achieving high scores, indicating enhanced adoption of appropriate hygienic and preventive behaviors.

Table (5) demonstrates that there was a highly statistically significant difference between the results of post-intervention phase compared to pre- intervention phase in favor of post- intervention regarding all items of studied female university students' attitudes related to the prevention and management of vaginal infections, pre and post the application of the instructional system design model ($P \leq 0.001$).

Figure (3) demonstrates that, before the intervention, 68.7% of students had a negative attitude, 23.0% had a neutral attitude, and only 8.3% showed a positive attitude. After the implementation of the ISD-based educational program, a remarkable improvement was observed, as 79.4% of students demonstrated a positive attitude, 16.2% had a neutral attitude, and only 4.4%

retained a negative attitude. These findings indicate a substantial positive shift in students' attitudes following the educational intervention, highlighting the effectiveness of the ISD model in promoting favorable health beliefs and preventive behaviors regarding vaginal infections.

Table (6) shows that female university students reported very high satisfaction with the instructional system design model. Nearly all indicators received "strongly agree," including teaching effectiveness (100%) and fairness of assessment (98%). Slightly lower yet still positive ratings appeared for clarity of materials and program organization. Overall, the model proved highly effective in meeting learning needs and ensuring strong engagement and satisfaction.

Figure (4) shows that the vast majority of students (97.9%) demonstrated a high level of satisfaction, while only 2.1% showed moderate satisfaction, and none reported low satisfaction. This indicates that the implemented instructional model was highly effective in fulfilling learners' academic and instructional expectations.

Table (7) shows that, there were highly statistically significant positive correlations between the university students' total knowledge, total self-care practices score, total student satisfaction, and total attitude scores regarding preventing and management of vaginal infection pre and post the application of the instructional system design model at ($p<0.001$).

Table (1): Distribution of the female university students according to their personal characteristics, (n=291).

Personal characteristics	No.	%
Age (Years)		
17 > 19	**285**	**97.9**
< 19	6	2.1
Mean ± SD 18.75±7.39		
Residence		
Rural	60	20.6
Urban	**231**	**79.4**
Marital status		
Single	**286**	**98.3**
Married	5	1.7
Monthly income		
Sufficient	21	7.2
Insufficient	**270**	**92.8**
The place of residence during study		
With the family	**265**	**91.1**
At relatives' homes	6	2.1
University city for students	20	6.8

Table (2): Distribution of the female university students regarding medical and menstrual history (291).

Medical and Menstrual History	No.	%
Age of menarche:		
11-<12	**240**	**82.4**
12-<13	35	12.2
>13	16	5.4
Mean ± SD 18.6±3.59		
Regularity of menstrual cycle		
Yes	**206**	**70.7**
No	85	29.3
Duration of menstruation		
3-<6	**250**	**85.9**
>6	41	14.1
Suffering from any menstrual disorders		
Yes	0	0.0
No	**291**	**100.0**
Suffering from pain accompanying menstruation		
Yes	**280**	**96.2**
No	11	3.8
Methods used to relieve menstrual pain		
Heat therapy	30	10.4
Massage	80	27.4
Relaxation and breathing techniques	61	20.9
Medication	**120**	**41.3**
Suffering from any diseases		
Yes	0	0.0
No	**291**	**100.0**
History of previous urinary tract infections		
Yes	20	6.8
No	**271**	**93.2**
History of previous vaginal infections		
Yes	**230**	**79.1**
No	61	20.9
Frequent occurrence of vaginal infections		
Every month	**240**	**82.4**
Every year	51	17.6

Table (3): Distribution of the female university students according to knowledge about vaginal infection pre- and post-application of the instructional system design model (n = 291).

General knowledge items	Pre		Post		Significance test	
	No.	%	No.	%	X^2	P-value
Anatomy of the female genital system						
Correct answer	50	17.2	255	87.6	17.48	<0.001**
Incorrect answer	241	82.8	36	12.4		
Characters of vaginal discharge						
Correct answer	90	30.9	260	89.4	19.88	<0.001**
Incorrect answer	201	69.1	31	10.6		
Meaning of vaginal infection						
Correct answer	80	27.4	220	75.6	19.44	<0.001**
Incorrect/don't know	211	72.6	71	24.4		
The causes and risk factors						
Correct answer	50	17.2	240	82.4	18.46	<0.001**
Incorrect/don't know	241	82.8	51	17.6		
Signs and symptoms						
Correct answer	44	15.2	250	85.9	19.78	<0.001**
Incorrect answer	247	84.8	41	14.1		
Prevention and control of vaginal infection						
Correct answer	88	30.2	244	83.8	18.56	<0.001**
Incorrect/don't know	203	69.8	47	16.2		
Self -care measures for prevent and control of vaginal infection						
Correct answer	45	15.4	255	87.6	18.96	<0.001**
Incorrect/don't know	246	84.6	36	12.4		

$X^{2:}$ Chi-square test. **Highly significant at p < 0.001.

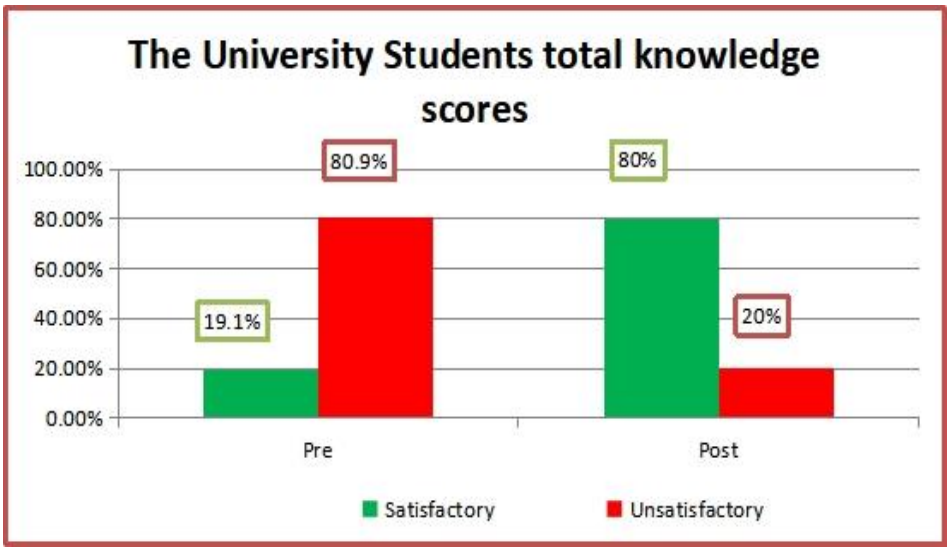

Figure (1): Percentage distribution of the university female students according to the total knowledge scores regarding vaginal infection pre and post the application of the instructional system design model, (n=291).

Table (4): Distribution of the female university students' reported self-care practices related to the prevention and management of vaginal infections pre and post the application of the instructional system design model (n = 291)

Reported self-care practices	Pre		Post		Significance test	
	No.	%	No.	%	X^2	P-value
Personal Hygiene Practices						
Done	**89**	**30.6**	**270**	**92.7**	**18.69**	**<0.001****
Not done	202	69.4	21	7.3		
Menstrual Hygiene Practices						
Done	**99**	**34.1**	**255**	**87.7**	**19.45**	**<0.001****
Not done	192	65.9	36	12.3		
Preventive Health Practices						
Done	**17**	**5.8**	**240**	**82.4**	**20.36**	**<0.001****
Not done	274	94.2	51	17.6		
Health-Seeking Behavior						
Done	**65**	**22.3**	**220**	**75.6**	**21.75**	**<0.001****
Not done	226	77.7	71	24.4		
Daily habits						
Done	**100**	**34.3**	**255**	**87.7**	**19.35**	**<0.001****
Not done	191	65.41	36	12.3		

$X^{2:}$ Chi-square test. **Highly significant at p < 0.001.

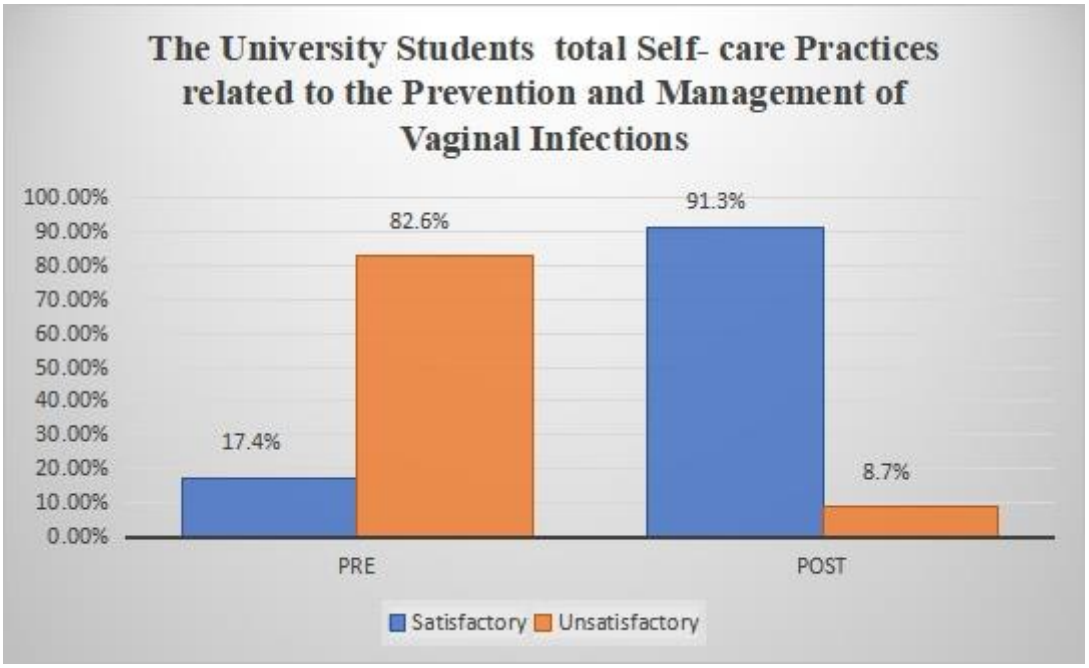

Figure (2): Percentage distribution of the university students according to the total self-care practices scores regarding prevention and management of vaginal infection pre and post the application of the instructional system design model, (n=291).

Table (5): Distribution of the female university students' Attitudes towards the preventive behaviors regarding the vaginal infection pre and post the application of the instructional system design model, (n = 291)

Attitudes items	Pre		Post		Significance test	
	No.	%	No.	%	X^2	P-value
Beliefs about vaginal infections						
Strongly agree	**21**	**18.3**	**99**	**86.1**	**30.22**	**0.001****
Agree	**15**	**13.0**	**11**	**9.6**		
Strongly disagree	**79**	**68.7**	**5**	**4.3**		
Perceptions about prevention of vaginal infection:						
Strongly agree	**30**	**26.1**	**103**	**89.6**	**29.61**	**0.001****
Agree	**10**	**8.7**	**11**	**9.6**		
Strongly disagree	**75**	**65.2**	**1**	**0.8**		
Attitudes toward self-care and health-seeking						
Strongly agree	**53**	**46.1**	**104**	**90.4**	**27.83**	**0.001****
Agree	**30**	**26.1**	**10**	**8.7**		
Strongly disagree	**32**	**27.8**	**1**	**0.8**		

X2: Chi-square test. **Highly significant at $p < 0.01$.

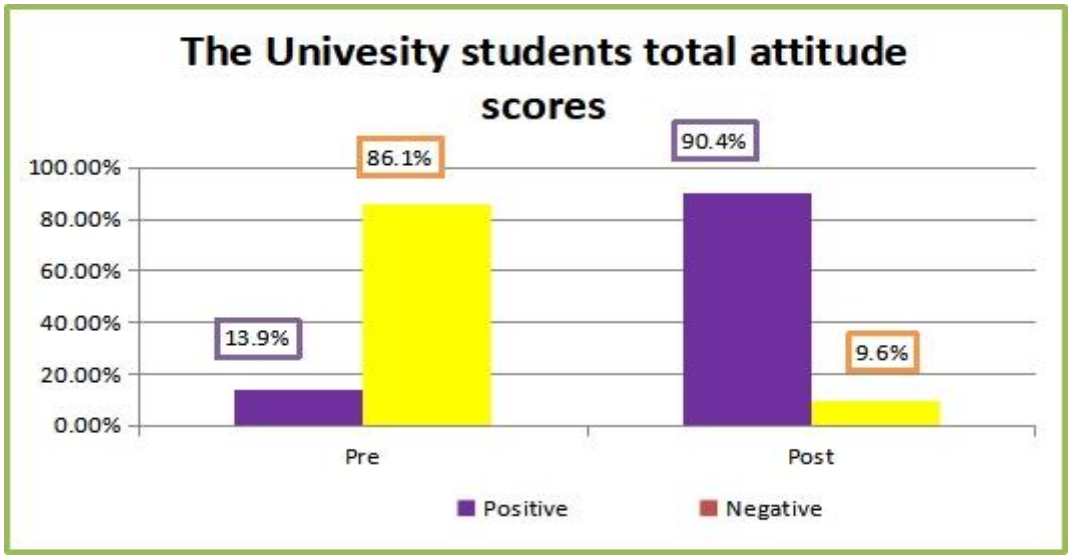

Figure (3): Percentage distribution of the university students according to the total attitude scores regarding vaginal infection pre and post the application of the instructional system design model, (n=291).

Table (6): Distribution of the female university students according to the level of satisfaction towards the implementation of an instructional system design model (n = 291).

Satisfaction statements	No.	%
The educational program met my learning expectations.		
Strongly agree	**280**	**96.3**
Agree	**11**	**3.7**
Strongly disagree	**0**	**0.0**
The teaching methods used were effective		
Strongly agree	**291**	**100.0**
Agree	**0**	**0.0**
Strongly disagree	**0**	**0.0**
The course content was relevant and useful.		
Strongly agree	**270**	**92.7**
Agree	**21**	**7.3**
Strongly disagree	**0**	**0.0**
The learning materials were clear and easy to understand.		
Strongly agree	**255**	**87.6**
Agree	**35**	**12.1**
Strongly disagree	**1**	**0.3**
The instructor's explanations were clear		
Strongly agree	**270**	**92.7**
Agree	**19**	**6.6**
Strongly disagree	**2**	**0.7**
The program encouraged active participation.		
Strongly agree	**250**	**85.9**
Agree	**30**	**10.3**
Strongly disagree	**11**	**3.8**
The assessment methods were fair and appropriate		
Strongly agree	**286**	**98.2**
Agree	**5**	**1.8**
Strongly disagree	**0**	**0.0**
The program improved my knowledge and skills		
Strongly agree	**280**	**96.3**
Agree	**11**	**3.7**
Strongly disagree	**0**	**0.0**
The overall organization of the program was effective		
Strongly agree	**240**	**82.5**
Agree	**49**	**16.8**
Strongly disagree	**2**	**0.7**
Satisfied with the overall quality of the program.		
Strongly agree	**290**	**99.7**
Agree	**1**	**0.3**
Strongly disagree	**0**	**0.0**

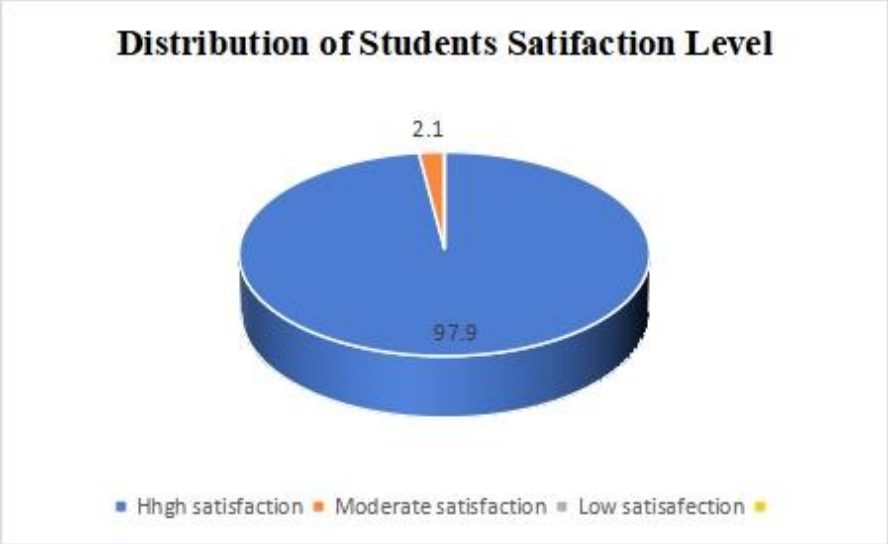

Figure (4): Distribution of students according to their level of satisfaction with the instructional system design model (n = 291).

Table (7): Correlations between the female university student total knowledge, total self-care practice, total satisfaction, and total attitude scores regarding vaginal infection pre and post the application of the instructional system design model, (n=291).

Variables	Total knowledge scores			
	Pre		Post	
	r	P-value	r	P-value
Total self-care practices score	0.539	0.001**	0.685	0.001**
Total attitude scores	0.670	0.001**	0.905	0.001**
Total student satisfaction	0.682	0.001**	0.805	0.001**

Not significant at p>0.005 **Highly significant at p < 0.001. r= correlation coefficient test

Discussion:

The present study aimed to evaluate the effect of applying an instructional system design model on knowledge, attitude and satisfaction regarding vaginal infections among female university students. The results revealed significant improvements in all aspects of participants' knowledge and self-care practices following the application of the ISD model, underscoring its effectiveness as a structured educational framework for reproductive health promotion among young females.

This study showed that most of the students were aged between 17 and 19 years, with a mean age of 18.75 ± 7.39 years, indicating that most participants were in late adolescence, a period characterized by heightened curiosity and vulnerability to health-related misinformation. Most students lived in urban areas and were single, which aligns with the demographic pattern of university populations. The finding that most of them reported insufficient income suggests that socioeconomic limitations might influence access to healthcare information and resources. Moreover, the fact that most of them lived with their families indicates a strong familial influence, which may affect personal health behaviors and openness to sexual and

reproductive health discussions. These demographic findings are consistent with **El-Sayed et al. (2021),** who noted that Egyptian female university students tend to be young, single, and financially dependent, which may limit their ability to seek private gynecological consultations or health education services. Similarly, **Abdel-Hady et al. (2020)** emphasized that limited financial means and cultural sensitivity surrounding reproductive health topics often contribute to poor awareness of vaginal hygiene and infection prevention.

The results in the present study revealed that most students experienced menarche between 11–<12 years, with the majority having regular cycles, and a normal menstrual duration of 3–<6 days. However, the high prevalence of menstrual pain and the reliance on medication as a primary coping mechanism highlight a notable gap in knowledge regarding non-pharmacological pain management. Moreover, most of the students reported a history of vaginal infections, with frequent recurrence, and a minority of them reported urinary tract infections. These findings indicate insufficient menstrual hygiene practices and a lack of preventive health knowledge among students before the educational intervention. This is consistent with **Mahmoud & Hassan (2024)**, who reported that dysmenorrhea and recurrent vaginal infections are common among female university students due to inadequate hygiene practices and limited health education. Similarly, **Mohamed & El-Hosary (2022)** found that misconceptions regarding normal vaginal physiology and delayed health-seeking behavior contribute to repeated infections among adolescent and young adult females.

As presented study showed that the students demonstrated marked improvements in knowledge after the ISD-based program. Pre-intervention, a minority of them could correctly define vaginal infection, understand causes and risk factors, and a minority of them identified symptoms correctly. Post-intervention, these percentages increased dramatically to most of them ($p < 0.001$). Similarly, knowledge regarding prevention, treatment, and complications improved significantly ($p < 0.001$). These findings validate the effectiveness of the instructional system design model as an educational tool. The structured phases of the ISD analysis, design, development, implementation, and evaluation allow for content adaptation to learners' needs and promote active learning, resulting in improved retention and understanding **(Gagné et al., 2020; Dick, Carey, & Carey, 2021**). Comparable results were reported by **Ali et al. (2023)**, who observed significant gains in reproductive health knowledge following a structured educational intervention among nursing students. Similarly, **Salem & Ibrahim (2022)** demonstrated that health education sessions based on learner-centered models effectively improved knowledge and attitudes toward genital infections among adolescent girls.

The improvement was illustrated the support of these findings. Before the ISD intervention, a minority of students had satisfactory knowledge levels, while most of them exhibited unsatisfactory knowledge. Following the program, most of them achieved satisfactory knowledge, and the proportion of those with unsatisfactory knowledge decreased to one fifth. This dramatic shift highlights the transformative impact of the ISD model on students' cognitive outcomes. This finding aligns with **El-Sayed et al. (2021)** and **Abd El-Moneim et al. (2022)**, who found that targeted health education interventions significantly enhance young women's awareness and preventive behaviors regarding reproductive tract infections. The observed post-intervention improvement also reflects the

success of the ISD model in fostering meaningful learning, as described by Gagne's theory of instructional events, where organized, repetitive, and feedback-driven instruction enhances information retention and application in real-life contexts.

From the researchers' perspective, the findings of this study provide compelling evidence of the efficacy of the ISD-based educational model in promoting reproductive health literacy among university students. The significant post-intervention gains suggest that well-structured instructional programs not only improve knowledge but may also influence preventive behaviors and health-seeking attitudes in the long term. The researchers believe that such educational interventions should be institutionally integrated into university health promotion curricula. Given the high prevalence of vaginal infections and poor pre-existing knowledge levels, periodic health education programs, particularly those grounded in instructional design principles, are essential to empower young women, reduce infection risks, and promote overall reproductive well-being.

As illustrated through the application of the instructional system design model led to a remarkable improvement in university students' self-care practices concerning the prevention and management of vaginal infections. Before the intervention, a relatively small proportion of students exhibited satisfactory levels of hygienic and preventive practices, indicating a lack of awareness and proper behavioral application.

The significant post-intervention improvements align with findings from **Ali et al. (2023)** and **El-Sayed et al. (2021)**, who documented similar enhancements in preventive and hygienic practices among university students following structured educational interventions on reproductive health. Likewise, **Mohamed and El-Hosary (2024)** found that targeted educational programs significantly improved self-care behaviors and reduced the prevalence of reproductive tract infections among female students. The researchers believe that this improvement is directly attributed to the systematic and learner-centered nature of the ISD model, which encourages active participation, repetition, feedback, and assessment—all essential for lasting behavioral change. As **Gagné et al. (2020) and Dick and Carey (2021)** suggest, such instructional frameworks facilitate not only cognitive understanding but also behavioral reinforcement through structured, stepwise learning processes.

The results presented demonstrate a highly significant transformation in students' attitudes toward preventive behaviors after the application of the ISD model ($p < 0.001$). Before the intervention, attitudes were generally poor or uncertain, as evidenced by the high proportions of disagreement and misconception across attitude domains. For example, only less than one fifth of students strongly agreed with correct statements about vaginal infections, and a majority of them strongly disagreed, reflecting poor awareness and stigmatization surrounding vaginal health topics. After the educational program, there was a dramatic positive shift: most of the students strongly agreed with correct belief statements, preventive behavior statements, positive self-care and health-seeking attitudes. The proportion of students with strongly disagree responses dropped to less than one tenth in all domains. These findings were further supported by Figure 3, which shows that the percentage of students with positive attitudes increased from a minority of them pre-intervention to most of them post-intervention, while negative attitudes sharply decreased.

This profound shift highlights the ISD model's role in altering attitude and enhancing motivation toward preventive behaviors. The structured and interactive educational sessions appear to have corrected misconceptions, reduced stigma, and empowered students to take proactive steps in managing their reproductive health. These findings are consistent with **Salem and Ibrahim (2022)**, who reported significant improvements in health beliefs and attitudes among adolescent girls following reproductive health education sessions. Similarly**, Abd El-Moneim et al. (2022)** found that participants' attitudes toward hygiene and preventive behaviors improved markedly after attending structured learning programs. From the researchers' perspective, the substantial improvements observed across knowledge, practices, and attitudes confirm that the instructional system design model is an effective educational strategy for promoting reproductive and preventive health awareness among university students. Its structured, evidence-based approach provides clear learning objectives, content alignment, active engagement, and evaluation—all of which contribute to cognitive and behavioral transformation.

The researchers assert that this model facilitates not only the acquisition of information but also the internalization and practical application of health-promoting behaviors. By incorporating interactive activities, visual materials, and feedback mechanisms, the ISD-based intervention successfully addressed the students' initial misconceptions and promoted a deeper understanding of vaginal hygiene, infection prevention, and health-seeking actions. Moreover, the study underscores the importance of integrating reproductive health education into university curricula, especially for young women in their late adolescence, who often face cultural taboos and limited access to accurate information. Continuous implementation of such educational programs could reduce the prevalence of vaginal infections, enhance menstrual hygiene management, and promote lifelong healthy habits.

The findings presented revealed that was a highly significant improvement ($p < 0.001$) in university students' attitudes toward preventive behaviors related to vaginal infections following the implementation of the instructional system design model. This positive change encompassed all measured attitude domains—beliefs about vaginal infections, perceptions regarding prevention, and attitudes toward self-care and health-seeking behaviors. Before the educational intervention, the majority of students demonstrated unfavorable or uncertain attitudes, characterized by misconceptions and limited awareness regarding vaginal infection prevention. For instance, a minority of students strongly agreed with positive belief statements about vaginal infections, while a majority of them strongly disagreed. Similarly, a minority of them strongly agreed with statements related to preventive behaviors, and just less than half of them strongly agreed with favorable attitudes toward self-care and health-seeking. These results indicate a general lack of reproductive health knowledge, negative perceptions, and low confidence in practicing preventive measures, findings that align with earlier research by **Mahmoud and Hassan (2024)** and **El-Sayed et al. (2021),** who reported low baseline awareness and negative attitudes toward genital hygiene among young women prior to health education programs.

Following the ISD-based educational intervention, there was a substantial and statistically significant enhancement in all attitude components. The percentage of students who strongly agreed with positive belief statements about vaginal infections

increased from a minority to most of them. Perceptions regarding prevention improved from a minority of them, and positive attitudes toward self-care and health-seeking rose from a minority of them to most of them. In contrast, the proportion of students who strongly disagreed with these statements decreased dramatically to below one tenth in all domains. These results demonstrate a significant shift from negative or neutral attitudes to positive, informed, and proactive perspectives toward vaginal health. Such findings affirm the effectiveness of the ISD model as a framework for health education. The model's systematic structure—consisting of analysis, design, development, implementation, and evaluation—ensures that instructional content is tailored to learners' needs, encourages active participation, and promotes retention and application of knowledge. According to **Gagné et al. (2020)** and **Dick, Carey, & Carey (2021)**, ISD-based interventions facilitate deep learning and attitudinal change by integrating cognitive, affective, and behavioral learning domains. In this context, the ISD model appears to have corrected misconceptions, fostered self-efficacy, and encouraged engagement in preventive health behaviors.

The observed improvements are consistent with studies conducted by **Ali et al. (2023**) and **Mohamed & El-Hosary (2024),** who found that structured educational programs on reproductive tract infections significantly improved female students' health beliefs, attitudes, and behaviors. Similarly, **Salem and Ibrahim (2022**) demonstrated that learner-centered reproductive health education enhanced adolescent girls' positive attitudes toward hygiene and medical consultation-seeking behaviors. These comparable findings across different populations reinforce the conclusion that structured, theory-based educational models like the ISD are effective in promoting positive health attitudes and behavioral change. From the researchers' viewpoint, these results highlight the trans-formative potential of the instructional system design model in addressing attitudinal barriers toward reproductive health among young women. The marked shift in attitudes following the ISD intervention suggests that when students are engaged through systematic, interactive, and evidence-based instructional methods, they develop a deeper understanding and a stronger sense of responsibility toward their own health.

The findings presented that indicated a consistently high level of satisfaction among female university students regarding the implemented instructional system design model. The overwhelmingly positive responses reflect the success of the program in aligning instructional strategies with learners' expectations and needs. The most notable outcome is the exceptionally high percentage of students who strongly agreed that the teaching methods used within the program were effective. This result highlights the instructional model's ability to incorporate evidence-based teaching practices that promote active learning and knowledge acquisition. High satisfaction scores for meeting learning expectations, the most of them improvement of knowledge and skills most of them fairness of assessments, and overall program quality further reinforce the instructional model's effectiveness. These findings correspond with studies demonstrating that well-structured instructional design models such as ADDIE, Dick and Carey, and Kemp models contribute to higher student engagement, clearer instructional pathways, and improved learning outcomes **(Branch, 2019; Dick, Carey & Carey, 2021).**

When learning activities are logically sequenced and assessments are aligned with

learning objectives, students tend to perceive the educational experience as more coherent, fair, and supportive of their academic growth. Despite slightly lower strong agreement levels on clarity of learning materials, most of them, encouragement of active participation most of them, and program organization, the overall pattern still reflects substantial satisfaction. These areas may represent opportunities for refinement rather than indicating weakness. Comparable research suggests that even high-performing instructional programs benefit from enhancing material accessibility and fostering more interactive learning environments **(Morrison, Ross & Kemp, 2019).**

This result illustrates that a marked improvement of female students' total satisfaction scores post-implementation of the ISD model, confirming its positive influence. The shift from pre- to post-application underscores the model's role in improving students' perceptions of instructional quality, aligning with empirical evidence that structured instructional design frameworks enhance learner outcomes when systematically implemented **(Molenda, 2021).** Overall, the results suggest that the instructional system design model was successful in providing a coherent, student-centered, and pedagogically sound educational experience that addressed learners' needs and supported high levels of academic satisfaction. From the researcher's perspective, the results strongly affirm the effectiveness of adopting a systematic instructional design model within higher education settings. The high levels of student satisfaction across almost all indicators reflect not only the model's appropriateness but also its practical value in improving instructional quality.

In summary, the researchers believe that the instructional system design model significantly contributed to improving the learning environment and student outcomes. Its successful implementation provides strong justification for its continued use and potential adaptation across other university programs.

The present study reveals that highly statistically significant positive correlations between university students' total knowledge, total self-care practice, total satisfaction, and total attitude scores regarding the prevention and management of vaginal infections, both before and after the implementation of the instructional system design model ($p < 0.001$). These correlations suggest that the ISD model not only improved each variable individually but also strengthened the interrelationships among them. The strong correlation between knowledge and self-care practice indicates that as students' understanding of vaginal infections increased, their ability to adopt appropriate preventive behaviors improved correspondingly. This finding aligns with health education research asserting that enhanced knowledge is a foundational driver of improved self-care behaviors, especially in reproductive and women's health contexts **(Glanz, Rimer & Viswanath, 2023).** When learners receive structured, evidence-based instruction, they are more likely to translate health knowledge into practical actions that promote well-being.

Similarly, the significant correlation between knowledge and attitudes suggests that the ISD model contributed to more positive perceptions and beliefs about vaginal health practices. Educational interventions grounded in systematic instructional design have been shown to foster more constructive attitudes by clarifying misconceptions and providing scientifically accurate information **(Bastable, 2022).** Furthermore, the strong positive correlation between student satisfaction and the other measured variables reinforces the effectiveness of the ISD approach. High satisfaction typically reflects students'

perception that the learning experience is relevant, well-organized, and responsive to their needs. As supported by prior studies, increased satisfaction often leads to greater engagement, sustained behavioral changes, and improved learning outcomes (**Keller, 2020).** Overall, the significant positive correlations across all variables demonstrate the successful integration and effectiveness of the instructional system design model. By enhancing knowledge, shaping attitudes, and improving practical behaviors, the ISD model created a coherent and impactful learning experience that supported student empowerment in managing vaginal health.

From the researcher's perspective, these results offer compelling evidence that the ISD model was highly successful in enhancing students' knowledge, attitudes, practices, and overall satisfaction regarding vaginal infection prevention and management. The consistency and strength of the correlations indicate that the learning components within the program were well-aligned and mutually reinforced. The researchers believe that the ISD model provided a clear structure for female students, enabling them to understand the relevance of the content and apply it meaningfully in real-life contexts. The significant improvement post-intervention suggests that systematic instructional planning, when combined with interactive teaching methods and relevant educational materials, can greatly influence health-related learning outcomes. These findings underscore the importance of continuing to use and expand ISD-based educational programs, especially in sensitive and essential health topics such as vaginal infection prevention. The model's ability to link cognitive, behavioral, and affective domains highlights its value as a powerful tool for improving women's health literacy among university students.

Conclusion:

The study concluded that applying the instructional system design model significantly improved female university students' knowledge, reported self-care practices, attitudes, and satisfaction regarding the prevention and management of vaginal infections. The model provided a systematic, learner-centered approach that effectively closed knowledge gaps and promoted healthier practices. Highly significant improvements were observed across all measured outcomes after the intervention. Overall, the ISD model proved effective and supports its use in future health education programs and curriculum planning. Therefore, the research hypotheses were supported, and the research aims were achieved.

Recommendations:

1. Integrate the instructional system design model into university health education curricula.
2. Expand the educational program to other faculties and student groups, particularly those with limited health literacy, to enhance preventive behaviors related to vaginal infections and other women's health issues.
3. Conduct periodic refresher sessions or follow-up workshops to reinforce self-care practices and ensure sustained knowledge retention.
4. Implement similar ISD-based programs in other health topics, such as reproductive health, sexually transmitted infection prevention and personal hygiene, to promote broader health awareness.

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تأثير تطبيق نموذج تصميم نظام تعليمي على معلومات وإتجاهات ورضا طالبات الجامعة فيما يتعلق بالعدوى المهبلية

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تُعدّ التهابات المهبل شائعة؛ إذ يفتقر العديد من طالبات الجامعات إلى الوعي الكافي، ويحملن مفاهيم خاطئة تعيق الوقاية السليمة والرعاية الذاتية. لذا، تُعدّ التدخلات التعليمية المنهجية والمصممة جيدًا ضرورية لتحسين المعلومات الصحية وتعزيز ممارسات الرعاية الذاتية الفعّالة. الهدف: تقييم تأثير تطبيق نموذج تصميم نظام تعليمي على معلومات واتجاهات ورضا طالبات الجامعة فيما يتعلق بالعدوى المهبلية. تصميم البحث: استُخدم تصميم بحث شبه تجريبي (مجموعة واحدة، اختبار قبلي وبعدي) لتحقيق هدف هذا البحث. مكان الدراسة: أُجريت الدراسة في جامعة كفر الشيخ، التي تضم ٥ كليات نظرية، مصر. عينة الدراسة: استُخدمت تقنية أخذ العينات العشوائية متعددة المراحل، وشملت ٢٩١ طالبة. أدوات جمع البيانات: استُخدمت أربع أدوات لجمع البيانات. النتائج: كشفت النتائج أنه بعد تطبيق نموذج تصميم النظام التعليمي، أظهر الطلابات تحسناً ملحوظاً في جميع جوانب المعلومات، وممارسات الرعاية الذاتية، والاتجاهات، ومستويات الرضا، مما يؤكد أثر النموذج، ويبرز فعاليته في دعم السلوكيات الوقائية وتحسين جودة التعليم بشكل عام. الإستنتاج: أثبت تطبيق نموذج تصميم النظام التعليمي فعاليته في تعزيز معلومات طالبات الجامعة، واتجاهاتهم، وممارسات الرعاية الذاتية لديهم فيما يتعلق بالتهابات المهبل، بالإضافة إلى رضاهم عن الجلسات التعليمية وأساليب التدريس. التوصيات: دمج نموذج تصميم النظام التعليمي في مناهج التعليم الصحي الجامعي.