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Effectiveness of Computer Assisted Teaching Programme on Knowledge and Practice Regarding Prevention of Genitourinary Infections Among Antenatal Women: A Quasi Experimental Study

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Abstract

Objective: To assess the effectiveness of a computer-assisted teaching programme on knowledge and practice regarding prevention of genitourinary infections among antenatal women.

Design: A quantitative quasi-experimental pre-test post-test control group design was adopted.

Setting: The study was conducted in the antenatal ward of the selected tertiary care hospital

Population: Sixty antenatal women diagnosed with urinary tract infection, vaginal candidiasis, or both were selected, with 30 participants each in the experimental and control groups.

Methods: Non-probability purposive sampling was used. Data were collected using a socio-demographic and clinical data sheet, structured knowledge questionnaire, and practice rating scale. Pre-tests were conducted for both groups. The experimental group received a one-hour computer-assisted teaching programme, while the control group received routine care. Post-tests were conducted on the seventh day. Data were analysed using descriptive and inferential statistics.

Main Outcome Measures: Knowledge and practice scores regarding prevention of genitourinary infections among antenatal women.

Results: Post-test knowledge scores ($p<0.001$) and practice scores ($p<0.05$) improved significantly in the experimental group compared with the control group. No significant correlation or demographic association was found.

Conclusion: The computer-assisted teaching programme effectively improved knowledge and self-care practices regarding prevention of genitourinary infections among antenatal women.

Relevance to Clinical Practice: Computer-assisted educational programmes can be incorporated into routine antenatal care to improve awareness and preventive practices related to genitourinary infections.

Patient or Public Contribution: Participants actively engaged in the educational intervention and assessment process.

Funding: No external funding was received for this study.

What Does This Paper Contribute to the Wider Global Clinical Community? This study highlights the effectiveness of technology-assisted educational interventions in improving knowledge and preventive practices related to genitourinary infections. The findings support the integration of structured educational

programmes into antenatal services, in resource-limited settings, to reduce maternal and neonatal morbidity associated with preventable infection.

Keywords: Urinary infection, antenatal women, computer assisted teaching.

***Main body of text**

Background of the study

During pregnancy there is progressive anatomical changes not only confined to the genital organs but also to all systems of the body. This is principally a phenomenon of maternal adaptation to the increasing demands of the growing foetus. The changes in urinary tract and genital organs contribute to genitourinary infections.[1]

Genitourinary infections are prevalent during pregnancy. Genitourinary tract infections may affect up to 41% of women of reproductive age globally and as many as 60% to 80% of these infections in pregnancy are asymptomatic.[2]

Maternal genitourinary tract infections have been significantly associated with a wide range of adverse perinatal and maternal outcomes including miscarriage, stillbirth, preterm birth, foetal growth restriction, neonatal and puerperal sepsis, neonatal encephalopathy and neonatal and maternal mortality. In developing countries where antenatal care coverage is limited, maternal infections are inadequately diagnosed and treated. Lower genital tract infections may ascend the reproductive tract and seed the amniotic cavity which can trigger an inflammatory cascade eventually resulting in a number of adverse outcomes including preterm birth, chorioamnionitis, foetal growth restriction, stillbirth, puerperal sepsis and early onset sepsis. Maternal infection accounts for an estimated 50% of preterm births, thus timely diagnosis and treatment of maternal infections is a prime target for the prevention of preterm birth as well as other adverse pregnancy outcomes.[3]

Maternal genitourinary tract infections are prevalent and substantially contribute to global maternal and neonatal morbidity and mortality, yet they are poorly quantified, detected, and treated in low income settings. Bacterial vaginosis (mainly candida infections) and urinary tract infection are the most common infections in pregnancy and there is strong evidence of their association with preterm birth, low birth weight and early onset neonatal sepsis.[3]

Objective

To assess the effectiveness of a computer-assisted teaching programme on knowledge and practice regarding prevention of genitourinary infections among antenatal women.

Hypotheses:

H1: There is a significant difference in the knowledge scores of antenatal women regarding prevention of genitourinary infections in the control and experimental group.

H2: There is a significant difference in the practice scores of antenatal women regarding prevention of genitourinary infections in the control and experimental group.

H3: There is a significant correlation between the knowledge and practice of antenatal women regarding prevention of genitourinary infections.

Methods

A quantitative approach using quasi experimental pre test post test control group design was for determining the effectiveness of computer assisted teaching programme on knowledge and practice regarding prevention of genitourinary infections among antenatal women**.** A total sample of 60 antenatal women with clinical diagnosis of UTI, vaginal candidiasis or both who meet the inclusion criteria. The purpose of the study was explained to them and informed consent was taken. Basic information was collected using socio demographic data sheet and information regarding clinical condition was collected using clinical data sheet. Pre test was conducted for both control and experimental group on the first day to assess the knowledge and practice of antenatal women regarding prevention of genitourinary infections using structured questionnaire and practice rating scale. A computer assisted teaching programme was given to the experimental group for one hour on the same day. The control group was given routine care. Post test was conducted for both control and experimental group on 7^{th} day using the same tools. Experimental group was selected after completing the data collection from the control group.

Data were collected using an interview schedule comprising a socio-demographic and clinical data sheet, a structured questionnaire to assess knowledge, and a practice rating scale to evaluate self-care practices regarding prevention of genitourinary infections among antenatal women.

Data analysis

The collected data were analyzed using descriptive and inferential statistics.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee, and permission was secured from the hospital authorities. Written informed consent was obtained from all participants prior to data collection.

Patient and Public Involvement

Antenatal women participated voluntarily in the study after informed consent was obtained. Participants contributed by responding to the assessment tools and actively engaging in the computer-assisted teaching programme. However, patients or the public were not involved in the design, conduct, reporting, or dissemination plans of the research.

Core Outcome Sets

The core outcomes assessed in this study were the knowledge and self-care practices of antenatal women regarding prevention of genitourinary infections. Outcomes were measured using a structured knowledge questionnaire and a practice rating scale before and after the intervention.

Results

The pre-test findings revealed that the majority of antenatal women had average knowledge regarding prevention of genitourinary infections. In the control group, 86.66% had average knowledge, 6.67% had good knowledge, and 6.67% had poor knowledge. Similarly, in the experimental group, 90% had average knowledge, 6.67% had good knowledge, and 3.33% had poor knowledge. There was no significant difference between the control and experimental groups in the pre-test knowledge scores ($\chi^2 = 0.35$, df = 2).

Regarding practice, 53.33% of antenatal women in the control group and 56.67% in the experimental group had good self-care practices related to prevention of genitourinary infections, whereas 46.67% in the control group and 43.33% in the experimental group had poor practices. No significant difference was observed between the groups in pre-test practice scores ($\chi^2 = 0.07$, df = 1).

Post-test analysis showed a significant improvement in the knowledge scores of antenatal women in the experimental group compared to the control group. The obtained Mann–Whitney U value of 197 was significant at $p<0.001$, indicating that the computer-assisted teaching programme was highly effective in improving knowledge regarding prevention of genitourinary infections.

A significant improvement was also observed in the post-test practice scores of the experimental group compared with the control group. The obtained Mann–Whitney U value of 319.5 was significant at $p<0.05$, revealing that the computer-assisted teaching programme was effective in improving self-care practices regarding prevention of genitourinary infections.

The study further revealed that there was no significant correlation between knowledge and practice scores among antenatal women. Additionally, no significant association was found between knowledge and practice scores and selected demographic variables such as age, gravida, education, and occupation.

Discussion

The main aim of this study was to determine the effectiveness of computer assisted teaching programme on knowledge and practice regarding prevention of genitourinary infections among antenatal women.

The present study revealed that majority of antenatal women in the control group (86.66%) and in the experimental group (90%) had average knowledge regarding prevention of genitourinary infections. Among the antenatal women 6.67% in the control group and 3.33% in the experimental group had poor knowledge regarding prevention of genitourinary infections.

The study findings are almost congruent with the findings of a descriptive study that was conducted in maternity ward and antenatal outpatient department of Western Regional Hospital, Pokhara Nepal where it was found that majority (65.05%) of the primigravida women had average knowledge regarding urinary tract infection.[4]

The present study also revealed that among antenatal women 53.33% in the control group and 56.67% in the experimental group had good practice regarding prevention of genitourinary infections and 46.67% in the control group and 43.33% in the experimental group had poor practice regarding prevention of genitourinary infections.

The present study findings are contradictory with the findings of a descriptive study that was conducted to evaluate health behaviours that are associated with vaginal infections on 360 married women at reproductive age from 18 to 44 years from eight governmental rural and urban primary health care centres in Ismailia, Egypt. The study revealed that majority of the infected women (83%) had unsatisfactory level of health behaviour.[5] The difference in the findings might be due to the small sample size selected for the present study.

The present study determined the effectiveness of computer assisted teaching programme on knowledge and practice regarding prevention of genitourinary infections among antenatal women. The study findings revealed that computer assisted teaching programme was very effective in improving the knowledge and practice of antenatal women regarding the prevention of genitourinary infections.

The present study finding is consistent with the findings of a study that was conducted to assess the effectiveness of awareness programme on urinary tract infection among 1000 antenatal mothers in selected

hospitals of Udupi District, Karnataka in 2015. This study concluded that there is significant effect of awareness programme of UTI on knowledge of antenatal women.[6]

The present study finding is also consistent with the finding of a quasi experimental study that was conducted to determine the effect of the intervention guidelines on self care practices of antenatal women with urinary tract infection. This study concluded that there is significant effect of intervention guidelines on self care practices of antenatal women with urinary tract infection.[7]

The present study finding is congruent with a quasi experimental study that was carried out among 300 pregnant women to determine the effect of an educational intervention based on the self efficacy theory on improving self care behaviours among pregnant women. This study concluded that the use of an educational intervention based on self efficacy theory had positive effects on the knowledge and self care behaviours of pregnant women.[8]

The present study also found out the correlation between the knowledge and practice of antenatal women regarding prevention of genitourinary infections. The study revealed that there is no significant correlation between the knowledge and practice of antenatal women regarding prevention of genitourinary infections.

The present study finding is contradictory with the finding of a quasi experimental study that was conducted to determine the effect of health education based on theory of planned behaviour on behavioural promotion of urinary tract infection prevention in a sample of 100 pregnant women. The study finding concluded that there was significant positive correlation between knowledge and performance for the prevention of UTI.[9] The difference in the findings might be due to the small sample size selected for the present study.

The present study also found out the association of knowledge and practice of antenatal women regarding prevention of genitourinary infections with selected variables such as age, gravida, education and occupation. The study revealed that there is no significant association of knowledge and practice of antenatal women regarding prevention of genitourinary infections with selected variables such as age, gravida, education and occupation.

The present study finding is contradictory with the finding of a study that was conducted among 40 rural women of reproductive age group to assess the effectiveness of planned teaching programme on knowledge related to reproductive tract infections at community health centre, Uttarakhand, India. The study concluded that there was a significant association of knowledge level of women regarding prevention of reproductive tract infections with age and educational status.[10] The difference in the findings might be due to the small sample size selected for the present study.

Strengths and Limitations

The key strength of the study is that, it used a quasi-experimental control group design and assessed both knowledge and practice outcomes using a structured intervention. However, the study had a small sample size, used purposive sampling, was conducted in a single hospital, and had a short follow-up period with self-reported practice assessment.

Interpretation Considering Other Evidence

The findings of the present study are consistent with previous studies showing that educational and awareness programmes significantly improve knowledge and self-care practices among antenatal women regarding urinary and reproductive tract infections. Similar studies also demonstrated positive effects of educational interventions on preventive behaviours and maternal self-care practices during pregnancy.

However, unlike some previous studies, the present study did not find a significant correlation between knowledge and practice, which may be attributed to the smaller sample size and shorter follow-up period.

Conclusion

Based on the findings of the present study, it was revealed that majority of the antenatal women do not have adequate knowledge and practice regarding prevention of genitourinary infections. This study also concluded that computer assisted teaching programme is very effective in improving the knowledge and practice of antenatal women regarding prevention of genitourinary infections. The present study results also revealed that there is no significant correlation between the knowledge and practice of antenatal women regarding prevention of genitourinary infections and there is no significant association of knowledge and practice of antenatal women regarding prevention of genitourinary infections with selected variables such as age, gravida, education and occupation.

Research Recommendations

- Similar studies can be conducted with larger sample sizes to improve generalizability.
- Long-term follow-up studies are recommended to evaluate retention of knowledge and sustainability of practices.
- Comparative studies can be conducted using different educational methods such as mobile-based learning, video-assisted teaching, or interactive counselling.
- Future research may include multiple healthcare settings and diverse populations.
- Studies assessing the direct impact of educational interventions on maternal and neonatal health outcomes are recommended.

Relevance to Clinical Practice

The study emphasizes the important role of nurse-led educational interventions in antenatal care. Computer-assisted teaching programmes can be integrated into routine maternal healthcare services to improve awareness, encourage preventive self-care practices, and reduce complications associated with genitourinary infections during pregnancy. The intervention is cost-effective, structured, and feasible for implementation in both hospital and community healthcare settings.

Disclosure of Interests

The author declare that they have no financial, personal, political, intellectual, or religious conflicts of interest related to this study

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Knowledge of antenatal women regarding prevention of genitourinary infections

Table 1

Frequency distribution and percentage of antenatal women based on pre test scores of knowledge (n=60)

Knowledge scores	Control (n=30)		Experimental (n=30)		df	χ^2
	f	%	f	%		
Good (24-34)	2	6.67	2	6.67		
Average (13-23)	26	86.66	27	90	2	0.35
Poor (0-12)	2	6.67	1	3.33		

Table 2

Frequency distribution and percentage of antenatal women based on pre test scores of practice (n=60)

Practice scores	Control (n=30)		Experimental (n=30)		df	χ^2
	f	%	f	%		
Good (36- 48)	16	53.33	17	56.67	1	0.07
Poor (0- 35)	14	46.67	13	43.33		