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THE CLIFF

"Nursing Journal of Kathmandu University"

Beyond Survival: Addressing Maternal and Sexual Health Through Nursing Education

Darj E

We live in a globalized world, with increasing connections over the borders. This makes us aware of serious threats, but also possibilities to valuable collaborations. The health systems only work with enough and, well-educated health providers with the right and ability to provide the highest attainable standard of health, and quality. WHO's estimated health workforce shortage of 14.7 million in 2023, is projected to decrease to 11.1 million by 2030, mostly in low- and lower-middle income countries, still a definite problem in many Southeast Asian and African countries.[1] Nurses are the largest occupational group, and many countries have developed nursing and midwifery strategies based on the global strategic directions.[2]

The term global health is wide and refers to the need for international cooperation. The Sustainable Development Goal (SDG) number three is defined as 'Ensure healthy lives and promote well-being for all at all ages'.[2] The possibility to improve health for all, is influenced by several factors, such as political will, economy, health system, education, lifestyle, infections, and the environmental situation. The word health refers likewise to various components, for example physical, mental, psychosocial, sexual health. The current version of the Cliff Nursing Journal of Kathmandu University illustrates a broad variation of health issues.

Maternal mortality is far too high around the world, and most of these deaths occur in low-income countries, furthermore most of the deaths are preventable. WHO statistics from Nepal in 1985 presented a maternal mortality rate (MMR) of 1200/100 000 livebirths, and the latest figures in 2023 show MMR 142/100 000 livebirths, a remarkable decrease in the country.[3] The SDG number three, aims to reduce maternal deaths to no more than 70/100 000 livebirths.[2] Besides reducing maternal deaths, broader dimensions of women's health, including physical, psychosocial, mental and sexual wellbeing also require continued attention and understanding. Sexuality and intimacy ought to be addressed, to improve women's health, targeting women during pregnancy and childbirth, and in the postpartum period.

The study 'Sexual Health of Women after Childbirth: A Qualitative Study' explores sexual health of women. By employing interviews, women shared their views on sexuality and intimacy in the postpartum period. The study demonstrates the need of awareness and knowledge among nurses and midwives to discuss private issues, a way to improve women's sexual health. Further to provide an accepting environment for the women to feel safe and able to talk openly on their sexual health. Similarly, a cross-sectional quantitative study 'Maternal antenatal attachment among pregnant women attending antenatal clinic of tertiary level hospital' evaluated the antenatal attachment to the foetus during pregnancies. The study shows that more than half of the included women had a low antenatal attachment to the expected child, according to their self-administrated questionnaire. The findings suggest the importance of incorporating attachment screening during antenatal care and providing targeted training for nurses and midwives to identify and support women with low maternal attachment.

Both studies underscore the need for continued education and training of nurses and midwives, which the Cliff Journal supports by serving as a platform for sharing research, innovation and professional growth.

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Readiness for Normal Childbirth and Perceived Social Support among Pregnant Women attending Antenatal Outpatient Department of Tertiary Level Hospital

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ABSTRACT

Background

Pregnancy and childbirth are transformative experiences involving physical, psychological, emotional, social, and cultural dimensions. Despite challenges like bodily changes and role shifts, comprehensive readiness is essential. Prenatal education enhances knowledge, self-efficacy, and confidence, while hormones like oxytocin and endorphins support labor progression. Social support contributes to healthier behaviors and mental well-being during pregnancy.

Objective

Assess readiness for normal childbirth and perceived social support among pregnant women.

Method

A quantitative cross-sectional study was conducted among 248 pregnant women attending antenatal outpatient department of Dhulikhel hospital with convenience sampling. The data was collected using Child Readiness Score (CRS) for childbirth readiness and Multidimensional Scale of Perceived Social Support (MSPSS) for perceived social support respectively administered through face to face interview with third trimester pregnant women.

Result

Pregnant women had lesser readiness in domains birth confidence and birth plan for normal childbirth. More than half of the respondents 64.1% had fair social support whereas less than one third respondents had poor social support. After adjusting confounders there was significant association found between childbirth readiness and increase in age by one year ($p=0.006$), adibasi/janajati caste ($p = 0.042$), secondary education ($p = 0.003$), nulliparity ($p < 0.001$). Good social support was significantly associated with readiness for normal childbirth ($p < 0.001$).

Conclusion

Pregnant women require optimal social support for higher readiness for normal childbirth. Younger, nulliparous and less educated women should be more emphasized during prenatal counseling.Strategies and interventions on improving social support, birth plan and birth confidence may be expected to improve impact on readiness for normal childbirth.

KEY WORDS

Pregnant women, Childbirth readiness, Pregnancy, Social support

INTRODUCTION

Childbirth is a significant life event with different dimensions where women need to be prepared for changes in their bodies, mental stress, shifting roles, and family dynamics.[1] Childbirth readiness is being physically and mentally prepared for pregnancy and labor and knowing how to cope more effectively during labor.[2-4] Perceived social support refers to the people's thoughts on care and appreciation individuals feel they receive from those around them. It encourages self-care and protects against the harmful effects of stress.[5] During pregnancy and childbirth, support from partners, family, and healthcare providers offers emotional, practical, and informational help, enhancing mental health and overall quality of life.[1]

Lack of childbirth readiness can lead to complications like preterm or prolonged labor, higher maternal mortality, and risks such as low birth weight and neonatal hypoxia. Moreover, poor readiness lead to unpleasant childbirth experiences which increases postpartum depression and postpartum traumatic stress disorder causing fear of future pregnancies.[6,7]

The World Health Organization (WHO) recommends that the ideal caesarean section (CS) rate should range between 10% and 15% per 100 live births. However, CS rates have nearly tripled over a decade, rising from 3.2% in 2006 to 10.5% in 2016 which is quite alarming.[8]

Factors such as low birth confidence, poor planning, limited knowledge, and fear of childbirth are linked to emotional well-being, stress, and a preference for CS in future births. The factors like lack of childbirth readiness seem to be related to their emotional well-being, stress symptoms and wishes for a CS on their next birth.[9,10]

The Childbirth Readiness Scale (CRS) is a newly validated tool to assess pregnant women's readiness, not yet used in other studies.[11] Limited research exists in developing countries on childbirth readiness and social support. This study will help to assess the normal childbirth readiness of pregnant women and perceived social support and its association.

METHODS

A cross sectional study was done to assess readiness for normal childbirth and perceived social support among pregnant women and its association with selected variables. The study was conducted in Antenatal care Outpatient Department (ANC OPD) in Dhulikhel Hospital from August to October 2022. The total sample size was 248. Convenience sampling technique was used to collect data from pregnant women.

Data collection was done using pretested structured questionnaire to obtain information from participants regarding socio demographic and obstetric characteristics. Childbirth readiness was measured using the CRS, an 18-item tool with strong reliability (Cronbach's α = 0.935). Perceived Social support was assessed using the MSPSS, a 12-item validated scale with high reliability (Cronbach's α = 0.90). This tool is based on seven point likert scale where 1 to 2.9 score was considered low support; 3 to 5 and 5.1 to 7 was considered moderate and high support respectively. Content validity was ensured through expert review. Higher CRS scores indicated higher readiness. Face to Face interview was done with the pregnant women to collect information from pregnant women.

Ethical approval was obtained from Institutional Review Committee (IRC) of Kathmandu University School of Medical Sciences (KUSMS). Informed consent was obtained from all the participants before taking information. Confidentiality was maintained during and after study and the information was not disclosed to anyone. Face to Face interview was done with the pregnant women to collect information from pregnant women. All third trimester pregnant women attending ANC OPD were included in the study population. Pregnant women who had absolute indications of cesarean section were excluded.

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 16. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used. Linear regression was applied to assess associations between childbirth readiness and perceived social support and other selected variables.

RESULTS

Part I: Socio-demographic characteristics of pregnant women

Table 1 shows that, more than two third of women (73.8%) were of age group 25-35. More than half of respondents (58.9%) level of education was above the Secondary education. Half of the respondents (50.4%) of women were homemakers; more than one third of respondents (47.6%) were of Adhibasi/Janajati. Nearly half of the women (48.8%) were from joint families. Majority of respondents (81.9%) had sufficient monthly income.

Table 2 shows that nearly two third (65.7%) of respondents had less than eight visits during their antenatal period and nearly half of respondents (45.6 %) were nulliparous.

Table 3 shows the scores of various factors of normal childbirth readiness among pregnant women. The highest mean score was in information literacy 18.11 ± 4.66 whereas lowest mean score was found to be in birth plan 15.35 ± 2.78.

Part II: Perceived Social Support among the pregnant women

Table 4 shows that more than half of the respondents 64.1% had fair social support whereas less than one third respondents had poor social support.

Part III: Association between Child birth Readiness and Perceived social support

Table 5 shows after adjusting for the confounders, there was significant association between child birth readiness and age, educational status, caste, parity. The mean readiness score was higher by in one year increase in age compared to lower (0.006, 95% CI 0.12 to 0.72). There is significant association with secondary school (0.003, 95% CI 2.68 to 13.20), Adibasi / Janajati (0.042, 95% CI -5.51 to 0.11) and nulliparous (< 0.001, 95% CI 2.08 to 6.67) with reference group.

There is a significant association between social support and child birth readiness with good social support (< 0.01, 95% CI 11.58 to 19.49).

Table 5 Association between normal child birth readiness with socio demographic, obstetric characteristics and social support among pregnant women (n=248).

Table 1. Socio-demographic characteristics of pregnant women (n=248).

Characteristics	Frequency (f)	Percentage (%)
Age group (mean age 27.30± 3.88)		
< 25	61	24.6
25-35	183	73.8
> 35	4	1.6
Level of education		
No education	11	4.4
Basic education	23	9.3
Secondary education	68	27.4
More than secondary education	146	58.9
Occupation		
Homemaker	125	50.4
Government employee	10	4.0
Non-government employee	61	24.6
Laborers	2	0.8
Agriculture	9	3.6
Business	31	12.6
Student	10	4.0
Caste		
Brahmin/ Chhetri	100	40.3
Adhibasi/Janajati	118	47.6
Madhesi	8	3.2
Dalit	21	8.5
Muslim	1	0.4
Family Type		
Nuclear	109	44
Joint	121	48.8
Extended	18	7.2
Monthly income		
Saving	34	13.7
Insufficient	11	4.4
Sufficient	203	81.9

Table 2. Obstetrical characteristics of pregnant women (n=248)

Characteristics	Frequency (f)	Percentage (%)
Number of ANC visits		
Less than 8 visits	163	65.7
More than or equals to 8 visits	85	34.3
Parity		
Nullipara	113	45.6
Primipara	106	42.7
Multipara	29	11.7

Table 3. Normal Childbirth readiness scores among the pregnant women (n=248)

Factors	Possible Score	Mean ± Std. Deviation
Total	18-90	66.09± 9.27
Self-management	4-20	17.14 ± 2.4
Information literacy	6-30	18.11± 4.66
Birth confidence	4-20	15.36 ± 2.50
Birth plan	4-20	15.35 ± 2.78

Table 4. Perceived Social Support among pregnant women.

Social support	Frequency (f)	Percentage (%)
Poor	67	27.0
Fair	159	64.1
Good	22	8.9

DISCUSSION

In this study childbirth readiness was highest in information literacy and lowest in birth plan. More than half of the women had fair social support whereas less than one third had poor social support. Readiness was significantly associated with age, education, caste, and parity. There was significant association between social support and childbirth readiness.

In this study childbirth readiness increased, with a one year increase in age, higher by 0.42 compared to lower (0.006, 95% CI 0.12 to 0.72). A significant association was found between childbirth readiness and age, contrasting with findings from Indonesia.[12] Similar to this study, a significant association was found between age and childbirth readiness at the Bantul Banguntapan Health Center, Yogyakarta. Pregnant women in the non-risk age group (20 - 35 years) were 15.4 times more likely to be prepared for childbirth. Among them, 68.8% were ready, while 87.5% of those in the risk age group (< 20 or > 35 years) were unprepared.[13] An adequate age for marriage and pregnancy supports maturity in handling pregnancy-related challenges.[14] Younger women (< 20 years) may have lower mental and behavioral maturity, making adaptation to pregnancy more difficult.[13] Age significantly influenced childbirth readiness, with 95.4% of prepared respondents aged 20-35 years and only 4.6% aged > 35 years. The 20-

Table 5. Association between normal child birth readiness with socio demographic, obstetric characteristics and social support among pregnant women (n=248)

Characteristics	Mean (SD)	B-Coefficient (β)	p-value	95% CI	B-Coefficient (β)	p-value	95% CI
Age	27.30 ± 3.88	0.50	0.001	0.21 to 0.80	0.42	**0.006**	0.12 to 0.72
Educational status							
No education	59.09 (5.68)	Ref			Ref		
Basic	66.65 (9.05)	7.56	0.026	0.93 to 14.19	7.72	**0.011**	1.78 to 13.67
Secondary	67.5 (9.49)	8.40	0.005	2.53 to 14.29	7.94	**0.003**	2.68 to 13.20
More than secondary	65.8 (9.25)	6.79	0.019	1.14 to 12.45	7.09	**0.007**	1.96 to 12.23
Occupation							
Unemployed	66.03 (9.11)	Ref					
Employed	66.16 (9.51)	0.13	0.11	-2.20 to 2.47	-1.56	0.157	-3.73 to 0.61
Caste							
Brahmin/ Chhetri	69.45 (6.15)	Ref					
Adibasi/ Janajati	65.40 (9.89)	-4.05	0.009	-7.10 to 0.999	-2.81	**0.042**	-5.51 to 0.11
Others	65.2 (8.47)	-4.25	0.052	-8.54 to 0.03	-1.26	0.52	-5.13 to 2.59
Family Type							
Nuclear	66.99 (7.45)	Ref			Ref		
Joint	65.28 (10.79)	-1.71	0.164	-4.12-0.70	-0.46	0.671	-2.62 to 1.69
Extended	66.16 (8.12)	-0.82	0.727	-5.47 to 3.83	-0.55	0.791	-4.60 to 3.51
Monthly Income							
Insufficient	67.72 (13.79)	Ref			Ref		
Sufficient	65.99 (9.31)	2.88	0.548	-7.41 to 3.94	-0.82	0.748	-5.87 to 4.22
Saving	66.17 (7.39)	3.22	0.632	-7.91 to 4.81	0.36	0.900	-5.30 to 6.03
Parity							
Nulliparous	63.80 (10.60)	Ref			Ref		
Primiparous	65.58 (7.74)	4.79	< 0.001	2.38 to 7.20	4.41	**< 0.001**	2.08 to 6.67
Multiparous	65.96 (6.32)	2.17	0.25	-1.54 to 5.87	2.46	0.195	-1.27 to 6.13
ANC visit							
< 8 visits	68.58 (7.74)	Ref			Ref		
≥ 8 visits	65.96 (6.32)	65.72	< 0.01	64.29 to 67.16	-0.20	0.858	-2.36 to 1.97
Social support							
Poor	61.28 (8.52)	Ref			Ref		
Fair	66.66 (8.08)	5.37	< 0.001	2.97 to 7.78	5.55	**< 0.001**	3.18 to 7.91
Good	76.68 (9.96)	15.39	< 0.001	11.34 to 19.45	15.54	**< 0.001**	11.58 to 19.49

Adjusting for age, Education, Ethnicity, Occupation, Monthly income, Parity, ANC visit

35 age group is considered the safest for pregnancy due to optimal physical condition, while pregnancies at > 35 years are classified as high-risk.[2]

Compared to those with no education, child birth readiness was higher among those with secondary education by 7.94 units (0.003, 95% CI 2.68 to 13.20), or higher education by 7.09 units more than secondary (0.007, 95% CI 1.96 to 12.23) than those with no education where significant association was found between childbirth readiness and educational status which was similar to studies in Indonesia (p = 0.01). Nearly 97.5% of mothers with higher education had excellent readiness. Higher education enables better knowledge and understanding of childbirth preparation, with more educated mothers showing better readiness. In contrast, mothers with lower education levels may have less access to information, affecting their preparedness.[2]

In contrast to this study, at the Jetis I Public Health Center, Bantul, no relationship was found between education and childbirth readiness, possibly due to many respondents being educated and gaining knowledge from prenatal classes.[16] Since education alone may not have a statistical impact, the participation of 63% of pregnant women in such classes enhanced their readiness. Contrasting findings at Banguntapan II Health Center showed that most respondents with secondary education (65%) were ready for childbirth. The study suggests that readiness may stem more from knowledge gained through routine prenatal care than from education alone, as regular check-ups increase awareness and preparedness.[1,4,17]

In this study, there was no significant association between income and childbirth readiness which was similar to other studies. This may be due to other factors like physical and psychological readiness, and the availability of government programs on safe motherhood, which reduces financial barriers for childbirth.[9]

There was a significant association between child birth readiness and parity where compared to those with nulliparous, on an average the mean childbirth readiness score was higher by 4.41 units among those with nulliparous (< 0.001, 95% CI 2.08 to 6.67). In a research done in Indonesia, where the majority of the women were multigravida, there was no discernible correlation between parity and preparedness for labor. The majority of women being multigravida, 69.6%, plan their pregnancies to help mothers be prepared for childbirth.[4]

The study reveals several key factors influencing like caste and childbirth readiness where there was a significant association. But there was no significant relationship was found between income, work, and childbirth readiness.

In this study the major finding was there was significant association between childbirth readiness and social support. In comparison with poor social support, on an average the mean childbirth readiness score was higher by 5.55 unit among those with fair social support (< 0.001, 95% CI 3.18 to 7.91), higher by 15.54 units among good social support (< 0.001, 95% CI 11.58 to 19.49). However, social support is a crucial factor for childbirth readiness, especially emotional support from the husband and family. Social support, particularly from family and husbands, was shown to significantly improve maternal preparedness for childbirth. Pregnant women with adequate social support were found to be significantly more ready for childbirth. Studies show that husband's support (p=0.005), ANC visits (p=0.012), and family economic readiness (p=0.001) impact a mother's preparedness, while lack of support can affect mental health and pregnancy outcomes.[10] The majority of respondents (58.7%) had good social support, and 56.5% had childbirth readiness. This aligned with a study where 55% had a good level of readiness and 45% had enough readiness.[2] The strength of the study is the validated tool CRS and MSPSS with good validity and reliability was used for the study whereas limitation is since the study had convenience sampling so it can be generalized in the similar population and setting.

CONCLUSION

This study revealed women scored lower on birth confidence and birth plan on child birth readiness. Healthcare workers should teach them how to self-manage of their own health, create a birth plan, and have confidence in their ability to give birth. More than half of the women reported having a fair level of social support. Similarly childbirth readiness increase with age; there is a significant association between childbirth readiness and caste, education level, and parity. Strong social support showed more ready for childbirth. Prenatal counseling focusing younger women less educated and nulliparous can increase readiness of women for normal childbirth. Social support should be strengthening to increase readiness for normal childbirth.

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Usability of Virtual Reality (VR) Video for Alleviating Pain and Anxiety among Women in Latent Phase of Labour: A Quasi Experimental Study

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ABSTRACT

Background

Labor pain is a significant experience for women, involving both physiological and psychological mechanisms. Non-pharmacological approaches, such as Virtual Reality (VR) video, have been explored as alternatives for pain management during labor.

Objective

To determine the usability of virtual reality (VR) video intervention in alleviating pain and anxiety among women in the latent phase of labor.

Method

This study adopted a quasi-experimental design. A total of 66 term pregnant women in latent phase of labor with pain score level 4 to 7 having regular uterine contractions who were admitted in the labour room and midwifery-led birthing unit at Dhulikhel Hospital, Nepal were included in the study. The participants were randomly assigned to an intervention group (33 participants) and a control group (33 participants) through block randomization, ensuring an equal likelihood of selection for either the intervention or control group. The intervention group were exposed to a 20 minute video intervention, whereas the control group had received the standard care provided at labour room and birthing unit of Dhulikhel hospital. The video consists of natural scenario where woman was feeling like flowing in a boat along with the soothing background music.

Result

Most of the baseline characteristics of both intervention and control group were similar. The pain and anxiety score decreased significantly among laboring woman in intervention group compared to control group. The mean pain score decreased by 1.7 units in intervention group immediately after intervention (95% CI: -2.46 to -0.96) whereas the mean pain score decreased by 1.1 units after two hours of intervention (95% CI: -2.2 to – 0.01). Besides that, the mean anxiety score decreased by 2.9 units in intervention group immediately after intervention (95% CI: -4.8 to -0.97) and there is no significant difference in anxiety score after two hours of intervention. (p-value 0.081)

Conclusion

This study found that the virtual reality (VR) video intervention is effective on reducing pain and anxiety among labouring women during latent phase of labour.

KEY WORDS

Labour pain, Pain and anxiety, Virtual reality (VR) video

INTRODUCTION

Labor pain impacts various aspects of a woman's physiological, behavioral, sensory, and cognitive responses. Anxiety diminishes pain tolerance, prompting nurses and midwives to prioritize pain and anxiety management during labor.[1] Neuraxial blockade, including epidural, spinal, and combined spinal-epidural analgesia, represents the gold standard in pain control for laboring women, but individualized care and alternative treatments may be necessary for optimal satisfaction. Both pharmacological and non-pharmacological pain management strategies are employed, recognizing the multifaceted nature of labor discomfort.[2]

Anxiety, fear, muscle tension, and fatigue during labor exacerbate pain sensitivity, potentially leading women to opt for Cesarean Section (CS) due to reduced confidence and feelings of incompetence. Nurses endeavor to alleviate pain and anxiety, crucially so for primigravida, as persistent anxiety could result in maternal and fetal hypoxia.[3] Virtual Reality (VR) emerges as a non-pharmacological distraction therapy, providing an immersive, pleasant environment through computer-stimulated visuals and sounds. By engaging individuals in a virtual environment, VR technology helps alleviate pain and anxiety by offering a sensory-rich experience akin to the real world.[4]

While developed countries have embraced VR as an alternative pain management approach in various contexts, including labor, limited research exists in Asian countries such as Iran and Indonesia.[5-8] Notably, no similar study has been conducted in Nepal regarding the use of VR video intervention for labor pain reduction. Thus, this study aims to assess the usability of VR video technology in alleviating pain and anxiety among women during the latent phase of labor, shedding light on its potential as a novel intervention in the Nepalese context.

METHODS

Study Design and Oversight

In this study, we adopted a quasi-experimental design to assess the usability of virtual reality (VR) video in alleviating pain and anxiety among women in the latent phase of labor. Prior to commencing the study, ethical approval was obtained from IRC-KUSMS (Institutional Review Committee of Kathmandu University School of Medical Sciences) with approval number 189/22. Enrollment for the study took place from June 18th to July 29th, 2023.

Screening and Recruitment

We recruited women in the latent phase of labor who were admitted to the labor room and the Midwifery-led Birthing Unit at Dhulikhel Hospital. Inclusion criteria comprised gestational age between 37-40 weeks, age between 19-40 years, proficiency in the Nepali language, and a pre-intervention pain level of 4-7 on the Visual Analog Scale, along with regular uterine contractions. Exclusion criteria included high-risk pregnancy diagnosis, recent pharmacological pain management, non-labor-related pain, or a history of conditions that could cause discomfort while using the VR hardware, such as motion sickness, sensitivity to flashing lights, or previous injuries to the eyes, ears, neck, or arms.

Randomization and management

Participants who met the eligibility criteria provided written informed consent prior to being randomly assigned to either the intervention or control group. Block randomization with a block size of 10 was used to ensure an equal likelihood of allocation to each group. Blinding was not feasible due to the nature of data collection. The intervention group received a 20-minute VR video session featuring calm scenes and music, while the control group received standard care. Prior to data collection, the VR video underwent validation by obstetrics and gynecology consultants, nursing/midwifery staff, and laboring women.

Data collection

Data collection involved three main tools: a questionnaire for socio-demographic and obstetric history, an observational checklist for clinical characteristics from medical charts, and outcome measures using the Visual Analog Scale (VAS) for pain and Hamilton Anxiety Rating Scale (HAM-A) for anxiety.[9]

Procedure

During data collection, baseline information was obtained, and participants were positioned comfortably on their beds with continuous monitoring of vital signs. Visual privacy was ensured, and participants were briefed on the VR equipment before initiating the video session. Assistance was provided throughout, with participants monitored for comfort and safety. Post-intervention, participants were assisted in removing the VR device, offered support, and their feedback was collected.

Outcomes and Statistical Analysis

We needed samples of 66 participants to detect 0.06 unit of mean difference 10 in pain during latent phase of labor between those who use VR videos compared to those who do not with SD1 ± 0.77 in control group and SD2 ± 2.02 in VR group23 at 95% CI and 80% power.

The primary analysis adhered to the intent-to-treat principle and employed linear regression models. Baseline information encompassed all data gathered from participants at the study's outset. However, during inferential analysis, data from participants lost to follow-up were excluded to ensure the analysis relied solely on data from participants who maintained their involvement in the study, thus upholding the integrity and accuracy of the statistical inferences drawn from the data.

Baseline characteristics of the two groups were compared using mean and standard deviation for continuous variables and frequency/percentage for categorical variables. The independent t-test, Chi-square test, and Fisher's exact test were utilized to assess significant associations between the groups.

Linear regression models were employed to test the degree of association between pain and anxiety scores during the latent phase of labor and VR video intervention. These models adjusted for confounding variables such as education, area of residence, occupation, blood pressure, previous history of VR use, and plan of pain management, at a 95% confidence interval with a p-value threshold of < 0.05. All statistical analyses were conducted using STATA-14.

RESULTS

In total, 66 participants were enrolled in the study during the latent phase of labour. Thirty-three were randomly allocated to the control group, while the remaining 33 were assigned to the intervention group. All participants underwent a baseline interview and willingly provided consent to take part in the study.

Baseline demographic data, as depicted in table 1, showed overall similarity between the intervention and control groups, except for a higher representation of participants from the Janajati ethnic group in the intervention group compared to the control group (75.8% vs. 39.4%, p-value 0.011). There were no significant differences observed in baseline obstetric factors such as gravida and previous history of abortion. Similarly, clinical characteristics including Body Mass Index (BMI), onset of labor, cervical dilatation, and uterine contraction were compared between both groups. Additionally, most participants in both the intervention and control groups did not have a predetermined plan for pain management during labor, with proportions of 78.8% and 81.8% respectively (p-value 0.757).

Likewise, there were no notable differences found in the pre-intervention mean pain and anxiety scores between the intervention and control groups, as outlined in table 2. The average pre-intervention pain scores were 4.9 (± 0.9) and 5.3 (± 0.9) with p-values of 0.081, while the mean anxiety scores were 8.8 (± 4.8) and 9 (± 3.2) with p-values of 0.789 in the intervention and control groups respectively.

The linear regression model, as presented in table 3, assessed the impact of VR video intervention during the latent phase of labor and revealed a significant decrease in pain and anxiety scores among laboring women in the intervention group compared to the control group. This effect persisted even after adjusting for potential confounding factors such as age, gravida, abortion history, gestational age, BMI, residence, religion, occupation, onset of labor, uterine contraction, previous use of VR for any purpose, and plan of pain management. Specifically, the mean pain score decreased by 1.74 units in the intervention group immediately following the intervention (95% CI: -2.46 to -0.96), and by 1.02 units after two hours of intervention (95% CI: -2.2 to – 0.01). Similarly, the mean anxiety score decreased by 3.18 units in the intervention group immediately after the intervention (95% CI: -4.8 to -0.97). However, there was no significant difference in anxiety scores after two hours of intervention (p-value 0.081).

Table 1. Baseline characteristics of the study participants in intervention and control group (n=33)

Variable	Intervention n (%)	Control n (%)	p-value
Socio-demographic variables			
Age (Mean ± SD)	26.2(±4.2)	24.9(±4.1)	0.24**
Education (Frequency/%)			
Illiterate and Primary	7(21.2)	2(6.1)	0.149*
Secondary and higher secondary	20(60.6)	21(63.6)	
Bachelor and above	6(18.2)	10(30.3)	
Ethnic Group(frequency/%)			
Bramin and chhetri	6(18.1)	16(48.5)	0.011*
Janajati	25(75.8)	13(39.4)	
Dalit and others	2(6.1)	4(12.1)	
Obstetric Characteristics			
Gravida			
Primi	18(54.6)	20(60.6)	0.618*
Multi	15(45.4)	13(39.4)	
History of abortion			
No previous history	31(93.9)	26(78.8)	0.618***
Previous history of at least one abortion	2(6.1)	7(21.2)	
Clinical Characteristics			
Body Mass Index (Mean ± SD)	28.2(±4.24)	28.7(±4.1)	0.68**
Onset of Labour (frequency/%)			
Induction	21(63.6)	18(54.5)	0.453*
Spontaneous	12(36.4)	15(45.5)	
Pre-intervention Cervical dilatation in cm (Mean ± SD)	1.9(±0.8)	1.8(±0.6)	0.436**
Uterine contraction (frequency/%)			
Mild	6(18.2)	1(3.1)	0.105*
Moderate and severe	27(81.8)	32(96.9)	
Previous history of VR video Use (frequency/%)			
No	30(90.9)	31(93.9)	0.642*
Yes	3(9.1)	1(6.1)	
Pain management plan during labour (frequency/%)			
Back massage and others	7(21.2)	6(18.2)	0.757*
No plan	26(78.8)	27(81.8)	

* Chi-square test
**Students Independent t-test
*** Fisher's Exact Test

Table 2. Pre-intervention pain and anxiety score of the study participants in intervention and control group at baseline.

Variable	Intervention n=33	Control n=33	Mean difference (md)	95%CI	p-value
Pain score (Mean ± SD)	4.9(±0.9)	5.3(±0.9)	0.38	-0.48 - 0.81	0.081**
Anxiety score (Mean ± SD)	8.8(±4.8)	9(±3.2)	0.27	-1.76 - 2.30	0.789**

** Students Independent t-test

Table 3. Effect of VR video intervention on women at latent phase of labour in intervention group, n=28

Variables	Univariate			Multivariate		
	Coef.	95% CI	p-value	Coef.	95% CI	p-value
Pain						
Immediately after intervention	-1.69	-2.41 to -0.97	< 0.001	-1.74	-2.68 to – 0.79	0.001
After two hours of intervention	-0.86	-1.84 to 0.09	0.074	-1.02	-2.35 to 0.32	0.131
Anxiety						
Immediately after intervention	-2.57	-4.28 to -0.86	0.004	-3.18	-5.00 to -1.35	0.001
After two hours of intervention	-2.32	-4.30 to -0.34	0.022	-2.38	-4.73 to -0.35	0.05

Note: Adjusted for possible confounders age, gravida, abortion history, gestational age, BMI, residence, religion, occupation, onset of labour, uterine contraction, previous use of VR for any purpose and plan of pain management.

DISCUSSION

This study demonstrates that implementing virtual reality (VR) video interventions during the latent phase of labor significantly decreases both pain and anxiety scores compared to a control group. Importantly, there were no significant differences in baseline characteristics such as socio-demographics, obstetric factors, and clinical features between the intervention and control groups.

Specifically, our findings revealed a significant contrast in the mean pain score (p-value 0.001) and mean anxiety score (p-value = 0.003) between the intervention and control groups. The mean pain score decreased by 1.74 units in the intervention group immediately after the intervention (95% CI: -2.46 to -0.96) compared to the control group. A study conducted in Indonesia similarly highlighted a notable difference between patients in the VR group and the control group during both the latent and active phases of labor (p-value < 0.01).[11]

Corroborating these findings, a study conducted at Cedar-Sinai Medical Center in Los Angeles in 2020 showed a significant reduction in pain (-0.52) in the VR arm compared to an increase in pain (+ 0.58) in the control arm (p = 0.03).

A systematic review and meta-analysis conducted by the University of Nanjing Medical University, School of Nursing in China, further supported our study's conclusions. This review highlighted that VR could alleviate pain during labor (mean difference -1.57, p < 0.001) and active labor periods (standardized mean difference -0.41, 95% CI -0.68 to - 0.14: p < 0.003) while also reducing anxiety (SMD -1.39, 95% CI -1.99 to -0.78; p < 0.001).[12]

Similarly, a systematic review and meta-analysis of randomized controlled trials on "the impact of virtual reality on pain management during normal labor" also support our findings. This review found that virtual reality was effective in significantly reducing the VAS pain score during labor compared to the control group (MD = -1.40, 95% CI [-1.83, -0.96], p < 0.001). The anxiety score during labor was also significantly reduced among the virtual reality group (SMD = -1.15, 95% CI [- 2.18, - 0.12], p = 0.03).[13]

However, despite the effectiveness of virtual reality video intervention, there were limitations, such as only visual privacy being maintained during data collection, a small study sample size, and the control arm lacking a "sham VR" intervention.

CONCLUSION

In conclusion, this study suggests that VR video intervention effectively reduces both pain and anxiety scores among women in the latent phase of labor compared to a control group that does not utilize this intervention. Thus, this study recommends using VR video as an alternative approach to reduce immediate pain and anxiety during the latent phase of labor.

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Effectiveness of Ambulation on Labour Pain among Pregnant Women admitted in Labour Unit of Dhulikhel Hospital

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ABSTRACT

Background

Labour pain is considered to be one of the most painful childbirth experience and management of pain is the main goals of maternity care using non-pharmacological measures. Ambulation during labour is considered to be effective for reducing pain perception associated with contractions and discomfort of labour.

Objective

To investigate the effectiveness of ambulation on labour pain during first stage of Labour among pregnant women.

Method

A Quasi-experimental study was conducted at labour unit of Dhulikhel Hospital among 50 pregnant women (25 in each experimental and control group) recruited using consecutive sampling technique. Numerical pain rating scale was used to assess the labour pain in two intervals pre-test and post-test. Data was analyzed by using descriptive and inferential statistics.

Result

The pre-test pain score of labour was not significantly ($p=0.375$) different with median pain score (Median=5) in both experimental and control group whereas there was significant difference ($p < 0.01$) between the median post-test labour pain score of ambulation group (Median 7 with Interquartile range 6-7) and routine care group (Median 8 with Interquartile range 7-8).

Conclusion

The study revealed that the post-test pain score of experimental group was significantly lower than control group, which shows that the ambulation is effective in reducing the pain perception during labour. Thus, it is recommended to ambulate the pregnant women during first stage of labour as a part of routine care provided by the nurses/midwives.

KEY WORDS

Ambulation, Labour pain, Pregnant women

INTRODUCTION

Experiencing labour pain and giving birth is normal physiological process, being a natural phenomenon, the childbearing women experiences many demanding sensation and discomfort most commonly worry about the pain, duration and process of labour.[1] Management of pain in labour has a beneficial effect through the use of pharmacological interventions had efficacy in reducing pain but are associated with adverse maternal and fetal effects whereas non-pharmacological measures reduce pain and promote physiological birth by progressing the labour and are cost-effective.[2,3]

WHO has recommended for encouraging the adoption of mobility and upright position during labour in women at low risk pregnancies.[4] As ambulation in labour is considered effective for reposition of fetus, favorable position for birth, promote gravity for fetal descent and reduce pain perception associated with contractions and discomfort of labour.[5]

A meta-analysis of various randomized and controlled trial conducted in Brazil concluded that the vertical position helped relieve labour pain and increased comfort and women satisfaction.[6] Also an experimental research conducted in Mangalore to evaluate the effect of ambulation during first stage of labour on pain reveals that mean pain score of experimental group (6.8) is significantly less than the control group (7.5).[7]

In Nepal, various studies have been conducted regarding the factors affecting labour pain but the effectiveness of non-pharmacological measures on labour pain is scarce.[8,9] Therefore the aim of the study is to investigate the effectiveness of ambulation on labour pain during first stage of labour among pregnant women.

METHODS

A Quasi-experimental (Nonequivalent control group) design was conducted in labour unit of Dhulikhel Hospital from 18th Nov to 24th Dec 2020. Considering the Standard deviation and mean of previous similar study, the calculated sample size was 50, with 25 participants in both experimental and control group recruited using consecutive sampling technique.[10] The first participant was allocated by using lottery method where the first participant choose to be in routine care/control group and the next as the ambulation/ experimental group. Then the remaining participants were alternatively allocated.

Inclusion criteria was primigravida women having low risk singleton pregnancy with cephalic presentation of age between 18 to 35 years having cervical dilation 3-5 cm, understanding Nepali language and are willing to participate.

Women who had undergone induction/augmentation of labour and were restricted for ambulation was excluded from the study.

A structured questionnaire was used to collect the data which consists of three parts: Demographic characteristics, Obstetrical data, Numerical Pain Rating Scale (NPRS-NP). The NPRS-NP was a validated 11 point rating scale in Nepali version where 0 = no pain and 10 = worst or severe pain. Score of 1 to 3 indicate mild pain, score of 4 to 6 indicate moderate pain and rating of 7 to 10 indicate severe pain.[11] Permission was taken from the developer for slight modification and using it for assessing labour pain. The pretest was conducted in 10% of the participants and reliability of the NPRS -NP in this study was found to be excellent using chronbach alpha (r=0.85).

Ethical approval was taken from Institutional Review Committee (IRC protocol approval number 199/19) and Post Graduate Committee of Kathmandu University School of Medical Sciences. Written permission was obtained from the head of department of Obstetrics and Gynaecology. Before recruiting the participants into the study, the study objectives, procedure was explained and both informed verbal and written consent were obtained. Privacy and confidentiality of the respondents were maintained throughout the procedure by not disclosing their personal information and role in the research. Also Code number were assigned rather mentioning their names. According to the intervention protocol, Firstly the sociodemographic data were obtained through questioning and the obstetrical data such as Chorioamniotic status, head station and cervical dilatation was obtained by per vaginal examination by researcher herself being a experienced registered nurse in midwifery as well as referring the women chart to consider the principles of per vaginal examination recommended by WHO, 2014.[4] Before the manipulation pretest pain score was assessed by using NPRS-NP. After that the ambulation group was encouraged to walk for 15 mins following 30 mins rest, continuing the process for about 2 hours and 15 mins where as in control group the participants received routine care.[10] Ambulation was assisted by researcher herself throughout the duration of experiment. Immediately after the allocated time frame of intervention protocol (i.e 2 hour and 15 mins), post-test pain score was assessed from both experimental and control group by using same Numerical Pain Rating Scale by the person who was unknown about the study participant .

Obtained data was checked for completeness and the data was coded and entered into statistical Package for Social Science (SPSS version 23). Then data was analyzed on the basis of the objectives of the study using descriptive statistics (Frequency, percentage, Mean, Median, Standard deviation, Interquartile range) and inferential statistics (Chi-square test and Mann-Whitney test).

RESULTS

Table 1 shows that the women in experimental group did not differ significantly from the women in control group in terms of socio-demographic and obstetrical characteristics ($p > 0.05$).

Table 1. Association of Socio-demographic and obstetrical characteristics between Experimental and Control group (n=50)

Characteristics	Experimental group (n=25)	Control group (n=25)	χ^2	
	Frequency (%)	Frequency (%)	value	p-value
Age (completed years)				
25 or less	17(68)	17(68)	0.00	1.00
26 or above	8(32)	8(32)		
Ethnicity				
Janajati	14(56)	12(48)	0.32	0.57
Others	11(44)	13(52)		
Religion				
Hinduism	16(64)	21(84)	2.59	0.11
Others	9(36)	4(16)		
Education level				
Upto lower secondary	10(40)	10(40)	0.00	1.0
Higher secondary and above	15(60)	15(60)		
Work pattern				
Mild	13(52)	10(40)	0.72	0.39
Moderate and heavy	12(48)	15(60)		
Area of residence				
Urban municipality	14(56)	18(72)	1.38	0.24
Rural municipality	11(44)	7(28)		
Gestational age (weeks)				
37 and 38	7(28)	13(52)	3.00	0.83
39 and 40	18(72)	12(48)		
Chorioamniotic status				
Intact	20(80)	19(76)	1.17	0.73
Rupture	5(20)	6(24)		
Head station				
Less than 0	22(88)	20(80)	0.83	0.44
0 and above	3(12)	5(20)		
Cervical dilatation (cm)				
3	18(72)	19(76)	0.10	0.74
4	7(28)	6(24)		

Chi-square χ^2, p-value < 0.05

Table 2 depicts level of pain where majority (96% in experimental group and 92% in control group) had moderate intensity of labour pain on pre-test pain score. Likewise on post-test pain score, majority 88% in control group had severe pain and 56% had severe pain in experimental group.

Table 2. Pre and post-test pain level in Experimental and Control group (n=50)

Level of pain	Experimental group (n=25)		Control group (n=25)	
	Frequency (percentage)		Frequency (percentage)	
	Pre-test	Post-test	Pre-test	Post-test
Mild pain	1 (4)	0 (0)	1 (4)	0 (0)
Moderate pain	24 (96)	11 (44)	23 (92)	3 (12)
Severe pain	0 (0)	14 (56)	1 (4)	22 (88)

Table 3 reveals that there was no any significant difference between experimental and control group on pre-test pain score ($p=0.375$) while there was significant difference between experimental and control group on post-test pain score ($p < 0.05$).

Table 3. Comparison of Pain between Experimental and Control group (n=50)

Group	Pre-test pain score		Post-test pain score	
	Median	Interquartile range	Median	Interquartile range
Experimental group	5	4-5	7	6-7
Control group	5	4-5	8	7-8
p-value	0.375		**< 0.001**	

DISCUSSION

The present study revealed that the women of experimental group does not significantly differ with the women of control group regarding socio-demographic characteristics and obstetrical characteristics ($p > 0.05$) Similar findings supported by the study conducted at Egypt which shows that there were no statistically significant differences regarding age, residence, level of education and occupation, vaginal discharge, condition of membranes and bishop score on admission ($p > 0.05$).[12]

According to this study the pre-test pain score of experimental group (Md 5 with IQR 4-5) did not significantly differ ($p =0.375$) from control group (Md 5 with IQR 4-5). The findings was supported by the study conducted in Kullu, India which showed there was no significant difference ($p=0.427$) between pre-test score in control (6.650 ± 2.3005) and experimental group (6.100 ± 2.0235).[10]

In this study, the post-test labour pain score of women in routine care group (Md 8 with IQR 7-8) was significantly greater than that of women in ambulation group (Md 7 with IQR 6-7). Similar findings was suggested by study conducted in Mangalore which revealed that median pain score of experimental group (Md 6.8) was significantly ($p=0.042$) less than the control group (Md 7.5).[7] Another study conducted in Kullu, India showed the post-test pain score of labour was significantly different ($p < 0.001$) i.e 5.80 ± 2.0157 and 3.450 ± 1.6376 in control and experimental group respectively.[10] These findings are similar as both the

supporting studies had conducted in India among first time pregnant women as a sample population. Being the parts South Asian culture, Nepal and India share special closeness and are strongly interlinked by population distribution, demographic characteristics and cultural tradition.[13]

The findings of the present study also supports the recommendation of WHO which states "encouraging the adoption of mobility and upright position during labour in women at low risk".[4]

The study hypothesis "There will be significant difference between experimental and control groups regarding post-test score of labour pain." was accepted. The present findings are in the path of the evidence that suggests encouraging a women to use non-pharmacological interventions, such as ambulation, movement and position changes can reduce pain, promote labour and provide empowerment with natural coping strategies.[14]

The possible limitation of the study were firstly the per vaginal examination of all the women was not performed by the researcher herself so as to follow the recommendation of WHO that indicate 4 hours interval between the per vaginal examination for routine assessment and regarding research design Quasi-experimental design was conducted where randomization was not done to recruit the sample that may result in selection bias.

CONCLUSION

The findings of the study revealed the post-test labour pain score of women in control group was significantly greater than that of women in experimental group which accepts the study hypothesis, "there will be significant difference between experimental and control groups regarding post-test score of labour pain." Therefore based on the results, study can be concluded that ambulation reduces the pain perception of women during labour.

The strength of the study was using consecutive sampling to recruit sample which ensures more representativeness of the sample. The post-test pain score of labour was assessed by the person who was unknown about the study participant which reduces the risk of detection bias. The study was implemented by researcher herself to maintain the uniformity of the procedure.

The findings of the study can provide baseline reference to maternal health care providers to plan and implement practices of ambulation as routine care for laboring women. Further study can be done to find the effect of ambulation on different aspects such as duration of labour and mode of delivery.

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Undergraduate Nursing Students' Experience and Satisfaction with Online Learning: A cross-sectional study

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ABSTRACT

Background

The perception of online learning is a crucial precursor to satisfaction, influencing student engagement and educational outcomes. Assessing students' perception, along with the perceived advantages and disadvantages, is essential for enhancing the effectiveness of online learning.

Objective

This study aimed to investigate the relationship between perceptions of online learning and satisfaction with its benefits and challenges among undergraduate nursing students.

Method

We conducted a web-based cross-sectional study among undergraduate nursing students using a semi-structured self-administered questionnaire and analyzed data with descriptive statistics and Poisson regression models in "R".

Result

Among 202 undergraduate nursing students (median age 22 years; mean 24 weekly class hours) 80% used both Wi-Fi and mobile data to attend online classes. Over half had a positive perception (55.4%) and satisfaction (53%) with online learning. After adjusting for age, perceived technical competency, prior online teaching experience, family support, COVID-19-related stress, students with a positive perception were 52% more likely to report satisfaction (aPR: 1.52, CI: 1.14-2.03). Students commonly cited independent learning, platform innovation and efficiency, supportive home environments, improved technical skills, flexibility, better communication, and course continuity as benefits. Perceived barriers included technological dependence, limited peer interaction, high costs, and physical ailments.

Conclusion

Positive perception significantly influenced student satisfaction with online learning. Online learning can effectively complement traditional education if its limitations are adequately addressed. Targeted strategies such as faculty and student training, interactive and engaging content, virtual clinical simulations, feedback collection and integration, and subsidized internet access might enhance the effectiveness of online nursing education.

KEY WORDS

Experience, Nursing-students, Online-learning, Satisfaction

INTRODUCTION

Online learning education delivered electronically through multimedia platforms emerged in the 1960s, with Canada launching the first complete online course in 1984. The internet later revolutionized this modality by enabling virtual classrooms and interactive platforms. Since then, synchronous and asynchronous formats have rapidly expanded.[1]

The COVID-19 pandemic in 2020 triggered a rapid shift to remote instruction globally, accelerating online learning adoption while revealing its limitations.[2]

Understanding students' perceptions and satisfaction with online learning is essential, particularly in nursing education, where reduced clinical exposure during virtual learning has contributed to student dissatisfaction.[3] These insights are crucial for designing hybrid learning models that balance theoretical and practical training, ensuring preparedness for future challenges in nursing education.[4] Factors such as student characteristics, faculty performance, and technological elements influence students' perceptions of online learning.[5,6] Positive perceptions foster satisfaction, which is linked to improved student engagement and academic outcomes.[5-7] Conversely, negative perceptions-driven by technical issues, untrained faculty, limited interaction, and poor support-can reduce satisfaction, increase dropout rates, and impede learning.[5-7]

Although past studies have examined factors influencing either perception or satisfaction, a few have explored their interrelationship.[5,6] In Nepal, a countrywide lockdown on March 24, 2020, to curb the spread of COVID-19 and contain the virus, prompted Kathmandu University School of Medical Sciences (KUSMS) to shift entirely to synchronous online learning with minimal preparation.[2] This study examined the association between students' perceptions and satisfaction with online learning during the COVID-19 pandemic and explored its perceived advantages and barriers among undergraduate nursing students.

METHODS

We conducted a cross-sectional study involving 202 undergraduate nursing students enrolled in the Bachelor of Science in Nursing (B.Sc.), Bachelor of Nursing Science (BNS), or Bachelor of Midwifery (BMid) programs at KUSMS during the 2020/2021 academic year using total enumeration sampling. Eligible participants were 18 years or older, attended online classes, and were willing to provide consent. After receiving verbal approval from the academic nursing director, we obtained the students' contact information and distributed study details via email, which included informed consent and a self-administered questionnaire. We followed up with non-responders through email, phone, and Viber. The Ethics Review Board of KUSMS approved the study (Approval No. 114/20). We utilized a modified version of the Evaluation of Online Learning Questionnaire by Sit et al. adapted through expert consultation.[8] The English questionnaire was administered via Google Forms and included logic features such as skip patterns and auto-checks.

Study variables included socio-demographics (age, residence, nursing program and year of study, and perceived family support), online learning-related factors (internet access, devices, costs, weekly study hours and self-directed learning hours, previous online learning and teaching experience, platforms used, activities conducted, and perceived technical competency), perceived COVID-19-related stress, satisfaction, and perceptions of online learning. We assessed stress and satisfaction using a single-item, 4-point Likert scale (1= strongly disagree to 4=strongly agree), and dichotomized for analysis. We measured perception across domains of online learning (information access, flexibility and convenience, peer interaction, teacher interaction, supplementary resources, and learning enhancement) using 29 statements rated on a 4-point Likert scale. After reversing negatively worded items, we summed the scores (range: 31-124) and categorized scores below the mean (75.6) as negative perception. The tool demonstrated high reliability (Cronbach's alpha of 0.86). Open-ended questions assessed perceived advantages, disadvantages, and improvement suggestions on course completion with online classes.

We exported and coded data in Google Sheets and analyzed in R software (version 2024.04.0+735). Descriptive statistics, including frequencies, percentages, mean, range, standard deviation, median, and interquartile range, summarize the data. We used bivariate and multivariate Poisson regression models to assess the associations between perception and satisfaction with online learning, adjusting for age, COVID-19-related stress, monthly internet cost, perceived technical competency, prior online teaching experience, and family support. We reviewed the responses to open-ended questions and grouped them into different categories based on similar meanings and recurring patterns, as previously done.[8]

RESULTS

All 202 participants were female nursing students aged 18-31 years, attending online classes from various provinces in Nepal, with 58% from Bagmati Province. The majority (63%) were enrolled in the BSc Nursing program.

Most students (70%) used both mobile and computer devices, and 80% accessed classes using mobile data and Wi-Fi. Classes were held 6 days a week with a median of 24 instructional hours (IQR: 20, 27.5) and 12 hours (IQR: 7,18) of self-directed learning per week.

All students completed online examinations (internal assessments, and/or pre-university), conducted under strict instructor-led quality control. They also engaged in curricular activities, such as case study presentations (45.4%), health teaching (62%), in-service education (11%), research proposal presentations (12%), and role-plays and simulation (6%) online.

Students primarily used Google Meet and Zoom for conducting and attending classes, while instructors shared materials via Google Classroom and communicated through Facebook Messenger, Viber, and Gmail. Although only 14% had prior experience with online learning, all reported using the internet for academic purposes. Notably, 86% reported COVID's impact on education.

Table 1. Demographic and online learning related characteristics of participants (n=202)

Characteristics	Frequency (%)
Age (in years), Median (IQR)	22 (18 - 23)
Nursing Program	
Bachelor of Science in Nursing (BSc Nursing)	127 (62.9)
Bachelor in Nursing Science (BNS)	55 (27.2)
Bachelor in Midwifery	20 (9.9)
Program year of study	
1st year	63 (31.2)
2nd year	75 (37.1)
3rd year	33 (16.3)
4th year	31 (14.4)
Residence	
Province 1	31 (15.3)
Province 2	15 (7.4)
Province 3	117 (58.0)
Province 4	15 (7.4)
Province 5	19 (9.4)
Province 6	1 (0.5)
Province 7	4(2.0)
Type of Internet used	
Both mobile data and Wifi	161 (79.7)
Wi-Fi only	33 (16.3)
Mobile data only	8 (4)
Weekly class hours, Mean (±SD)	24 (6.5)
Weekly self-directed learning hours, Mean (±SD)	12.3 (6.3)
Previous experience of online learning	28 (13.8)
Conducted classes online as a student teacher	81 (40.0)
Monthly cost of internet in NRs., Median (IQR)	1500 (1000 - 2000)
Perceived technical competency	145 (71.8)
Other siblings attending or conducting online classes	79 (39.1)
Perceived family support for online classes	164 (81.2)
Perceived stress due to COVID-19	174 (86.1)

NRs- Nepalese Rupees
IQR: Interquartile Range (Q1, Q3), SD: Standard deviation

Perception of different domains of online learning

Over half (55.4%) of respondents had a positive perception of online learning. Table 2 presents their responses to perception statements across all six domains. In terms of access to information and learning materials, while 88% agreed that teachers provided adequate information on the subject evaluations, only 54% reported having access to missed classes' recordings. Concerning flexibility and convenience, most students (79%) appreciated the opportunity to search independently for answers, and 72% reported learning at their own pace and completing tasks on time. However, 77% disagreed that they spent more time studying than during in-person classes, and 43% preferred traditional class timings. Regarding peer interaction, although 81% of students felt they received help from classmates, only 55% believed they had sufficient group study opportunities. Moreover, 52% struggled to interact electronically with peers, and 55% reported feelings of isolation. In terms of teacher interaction, most students (91%) felt encouraged by the teachers to take responsibility for their own learning, and 61% were comfortable providing feedback. Nonetheless, only 30% found electronic communication with teachers as effective as in-person interaction. With respect to face-to-face sessions, while 69% valued in-person interaction, only 30% felt they received enough of it. Finally, regarding enhanced learning and understanding, most (75%) agreed that online activities stimulated their thinking, and 63% felt that instructors were skilled in facilitating online classes. However, only 54% felt confident learning difficult content online, and only 42% believed they understood concepts better through online learning.

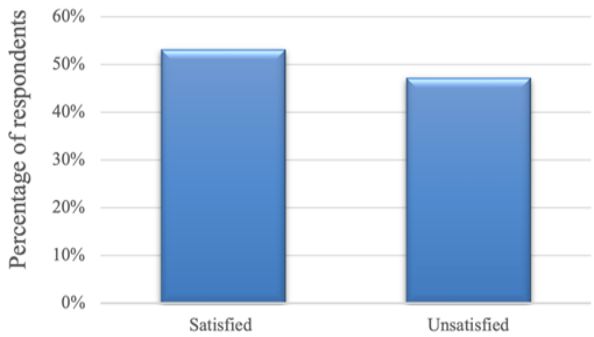

Fig. 1. Overall satisfaction of undergraduate nursing students with online learning

Factors associated with online learning

In univariate models, satisfaction was significantly higher among students with a positive perception (PR:1.80; 95% CI: 1.33-2.43, p-value: < 0.004), older age, prior experience as a student teacher, perceived technical competency,

Table 2. **Perceptions of undergraduate nursing students across key domains of online learning (n=202)**

Statements regarding perception of online learning	DS n(%)	D n(%)	A n(%)	AS n(%)	Mean score (SD)
Domain A: Access to information and learning materials					
Adequate learning materials/sources for classes were provided so that I can gain a thorough understanding of the subjects taught.	3 (1.5)	44 (21.8)	144 (71.2)	11 (5.5)	2.8 (0.5)
The information for joining every online class was clearly communicated with me so that I could attend it easily.	7 (3.5)	31 (15.3)	126 (62.4)	38 (18.8)	2.9 (0.7)
Our teachers provided adequate information regarding the evaluation of the subjects being taught.	3 (1.5)	21 (10.4)	160 (79.2)	18 (8.9)	2.9(0.5)
There was opportunity to access the class recordings that I was not able to attend.	25 (12.4)	67 (33.2)	92 (45.5)	18 (8.9)	2.5(0.8)
Domain B: Flexibility and convenience					
I was able to learn the subjects at my own pace.	1 (0.5)	57 (28.2)	131 (64.8)	13 (6.5)	2.7 (0.5)
I was able to complete tasks at time with more ease.	2 (1.0)	53 (26.2)	132 (65.3)	15 (7.5)	2.8(0.6)
The timings of classes were more preferable than onsite classes.	13 (6.4)	74 (36.6)	107 (53.0)	8 (4)	2.5 (0.7)
I spent more time on studying during online learning compared to onsite classes at college.	27 (13.3)	128 (63.4)	43 (21.3)	4 (2.0)	2.1 (0.6)
Through online learning, I was able to search for answers to my questions in internet rather than asking the teacher.	4 (2.0)	39 (19.3)	132 (65.3)	27 (13.4)	2.9 (0.6)
With the use of electronic communication, I felt comfortable for asking questions when I did not understand something during online class.	8 (4.0)	63 (31.2)	125 (61.8)	6 (3.0)	2.6 (0.6)
Domain C: Opportunity for interacting with peers					
There was adequate opportunity to interact with peers during teaching learning sessions online.	19 (9.4)	84 (41.6)	85 (42)	14 (7.0)	2.5 (0.8)
I felt isolated from other classmates during online learning.	26 (12.9)	65 (32.1)	95 (47.0)	16 (8.0)	2.5 (0.8)
I could obtain help from other students when I encountered difficulty.	12 (6.0)	26 (12.8)	147 (72.8)	17 (8.4)	2.8 (0.6)
It was difficult for me to interact with my classmates through electronic communication modality.	16 (8.0)	80 (39.6)	94 (46.4)	12 (6)	2.5 (0.7)
There was adequate opportunity to study with other students in online groups.	9 (4.4)	81 (40.1)	107 (53)	5 (2.5)	2.5 (0.6)
I was comfortable and actively participated in discussion with peers and other online learning activities.	6 (3)	58 (28.7)	128 (63.3)	10 (5.0)	2.7 (0.6)
Domain D: Opportunity for interacting with teachers					
There was adequate opportunity to interact with teachers during online learning sessions.	10 (5.0)	75 (37.1)	113 (55.9)	4 (2)	2.5 (0.6)
I was encouraged to take responsibility of my own learning by my teachers.	1 (0.5)	17 (8.4)	171 (84.7)	13 (6.4)	2.9 (0.4)
I received adequate feedback from my subject teachers on my performance during online learning sessions.	12 (5.9)	63 (31.2)	114 (56.1)	13 (6.8)	2.6 (0.7)
The timing and nature of response from the lecturers was up to my expectation.	8 (4.0)	67 (33.1)	121 (59.9)	6 (3)	2.6 (0.6)
Email and other electronic communication with the teacher was effective compared to in person communication.	27 (13.4)	115 (56.9)	53 (26.2)	7 (3.5)	2.2 (0.7)
There was adequate opportunity to provide feedback to my teachers/ facilitators.	9 (4.4)	70 (34.6)	121 (60)	2 (1)	2.6 (0.6)
Domain E: The value of supplementary face to face resource sessions					
The face-to-face interaction during online learning was adequate.	23 (11.3)	119 (59)	60 (29.7)	0	2.2 (0.6)
The face-to-face interaction during online learning was valuable.	9 (4.5)	53 (26.2)	130 (64.3)	10 (5.0)	2.7 (0.6)
Domain F: Enhanced learning and understanding					
I was better able to understand the concepts taught via online learning.	16 (8.0)	101 (50.0)	84 (41.5)	1 (0.5)	2.3 (0.6)
All teachers were well skillful enough to facilitate my learning via online mode.	11 (5.4)	63 (31.2)	123 (60.9)	5 (2.5)	2.6 (0.6)
The online learning activities were able to stimulate my thinking about the subject content.	5 (2.5)	44 (21.8)	150 (74.2)	3 (1.5)	2.7 (0.5)
The technology (e.g. video clips, video presentation) used for the online courses did not work in the way they were supposed to facilitate my learning.	8 (3.9)	98 (48.5)	89 (44.1)	7 (3.5)	2.4 (0.6)
Online teaching approach built my confidence in my ability to learn difficult subject matter.	16 (7.9)	76 (37.6)	102 (50.5)	8 (4)	2.5 (0.7)

DS=Disagree Strongly, D=Disagree, A=Agree, AS= Agree Strongly

Table 3. Association between satisfaction and perception of online learning among undergraduate nursing students at KUSMS (n=202)

Characteristics	Bivariate analysis			Adjusted Model*		
	PR	95% CI	p-value	aPR	95% CI	p-value
Perception of online learning						
Negative perception	Ref			Ref		
Positive perception	1.80	1.33-2.43	0.004	1.52	1.14-2.03	0.052

Note:PR=Prevalence Ratio
*Adjusting variables: age, monthly internet cost, prior online teaching experience, perceived technical competency, COVID-19 related stress, and perceived family support.

lower COVID-19 related stress, and perceived strong family support. Monthly internet showed no significant association with satisfaction. In our final multivariable model (Table 3), positive perception remained significantly associated with satisfaction (aPR: 1.52, CI: 1.14-2.03, p-value: 0.052) after adjusting for age, monthly internet cost, prior online teaching experience, perceived technical competency, COVID-19 related stress, and family support.

Perceived advantages and disadvantages of online learning

Students highlighted several benefits and limitations of virtual learning during the COVID-19 pandemic. We present their frequency in table 4.

Perceived advantages

-Enhanced independent learning: Online classes prompted critical thinking and self-directed learning. Students reported better conceptual understanding, timely task completion, and reduced academic pressure.

-Innovative and efficient platform: Students valued the ability to access, and revisit recorded lectures and considered online platforms innovative and time-efficient alternatives to traditional learning.

-Favorable learning environment: Many found the home safer, more comfortable, less distracting, and less intimidating than the university environment. Family love, affection, and support fostered emotional well-being, focus, and academic performance.

-Improved digital skills: Virtual learning improved their technical proficiency, boosting confidence in using digital tools for academic tasks and conducting presentations.

-Flexibility: Students valued the ability to attend classes from home at their own pace, finding the sessions less intense than in-person lectures.

-Improved communication: Despite physical separation, students reported improved communication with peers and instructors via Viber, email, and messaging platforms.

Table 4. Frequency of perceived advantages and disadvantages of online learning

Perceived Advantages	n
Enhanced independent learning	99
Innovative and efficient platform	91
Favorable learning environment	81
Improved digital skills	82
Flexibility	76
Improved communication	72
Academic continuity	65
Perceived disadvantages	
Reduced effectiveness	199
Technological reliance	145
Limited human interaction	134
Physical ailments	79
High cost	45
Lack of clinical exposure	37

-Academic continuity: Online learning ensured uninterrupted education, enabling students to complete the academic year despite lockdown restrictions.

Perceived drawbacks

-Reduced effectiveness: All students found online classes less engaging and motivating, with limited access to physical resources and increased household distractions at some points.

-Technological reliance: Dependence on digital format led to stress during power outages or internet disruptions, causing missed classes and delayed examinations.

-Limited human interaction: Students experienced social isolation due to minimal peer and teacher interaction.

-Physical ailments: Extended screen time led to eye strain, headaches, fatigue, neck pain, and backaches.

-Increased costs: Online learning-imposed burdens on students due to the need for electronic devices, internet access, and electricity, in addition to tuition fees.

-Lack of clinical exposure: Students emphasized that online platforms could not substitute for hands-on clinical training essential in nursing education.

Students unanimously recommended implementing virtual simulations and resuming in-person clinical training at the university hospitals post-lockdown, with appropriate precautions. To enhance future online learning, they proposed several strategies. For technical improvements, they suggested reimbursing internet costs for students to ensure stable access, adopting a reliable university-hosted platform for both teaching and examinations, and providing recorded lectures for review. Methodological improvements included using interactive teaching methods such as videos, simulations, group discussions, and

multimedia tools; supplying adequate learning resources; and conducting regular assessments with feedback. To improve communication, students recommended encouraging camera use to increase interaction, integrating student feedback into teaching practices, and fostering instructor empathy. They also emphasized the need for faculty training in digital tools, student orientation on online platforms, punctual classes, and prompt alternatives for canceled sessions.

DISCUSSION

Among the nursing students of KUSMS, 55% had a positive perception of online learning, and 53% were satisfied with it. The students with a positive perception had 1.5 times higher prevalence of satisfaction. Reported benefits of online learning included enhanced independent learning, an innovative and flexible platform, a supportive home environment, improved technical skills, better communication, and uninterrupted coursework. However, students also noted key drawbacks - technological dependence, physical ailments, high cost, limited social interaction, and unsuitability of online modality for clinical training.

Students had an overall positive perception of online learning, which aligns with earlier studies conducted before and during the COVID-19 pandemic among medical and non-medical students.[9-11] Like others, our participants felt online learning improved autonomy, technological confidence, and communication with faculty and classmates, while offering continuity and flexibility during the pandemic.[7,11,12]

Forty-three percent of students perceived virtual classes as less effective, particularly for learning practical nursing skills. Likely, 20-77% of students in various national and international studies reported negative perceptions of online learning.[10,11,13,14] Though interaction with peers and teachers is an important factor for learning, students found it lacking in the online setting. Other commonly cited disadvantages included complete dependence on technology, higher costs, monotony, reduced motivation, feelings of isolation, and screen-related health issues, as echoed widely in existing literature.[7,8,10,11]

Despite these challenges, participant satisfaction remained relatively high, consistent with other studies.[12,15] Our findings corroborate with studies reporting that older students tend to be more disciplined, motivated, engaged, confident, and less anxious, contributing to a more favorable attitude towards online learning.[16,17] Similarly, other studies indicate that pandemic-related anxiety impaired students' cognitive performance, attention, and engagement, leading to negative perception and dissatisfaction, whereas those with lower anxiety levels adapted more positively and viewed online learning as an opportunity.[16,18]

KUSMS implemented online medical education for the first time during the pandemic, yet students perceived it positively. Online education enables prompt teacher-student communication and rapid delivery of updated, standardized materials. It allows students to build knowledge at their own pace, take ownership of their learning, and develop self-discipline, time management, and autonomy.[7,15,16] These benefits, echoed by our participants, might have reinforced their expectations and fostered positive perceptions and satisfaction.[19] However, there is a wide variability in satisfaction across studies, which may also stem from differences in institutional preparedness, heterogeneous satisfaction assessment tools, and student backgrounds.

Students highlighted drawbacks of reduced interactivity and accountability in an online setting, which may impact their learning outcomes and mental health.[16,18] Technical issues, such as poor connectivity and limited support, further compounded their dissatisfaction.[11,15,16] Participants recommended improvements, including recorded lectures, interactive teaching methods such as videos, conducting frequent exams, and consistent feedback collection and integration to enhance learning. They emphasized the need for hands-on clinical experience to develop essential nursing skills alongside online learning. Other studies raised similar concerns where medical students expressed worry about their clinical competency post-graduation from the university, following online education.[9,14,15,20] As suggested, incorporating recorded demonstrations, virtual simulations using high-fidelity manikins, and dry lab sessions could bridge this gap.

Overall, students' positive perception and satisfaction suggest online learning could serve as a viable complement to traditional teaching. Our findings collectively underscore the need for addressing technological and pedagogical barriers, such as offering reliable internet access, training faculty, and adopting interactive approaches to optimize future online education. Future studies should examine how perception and satisfaction influence academic and clinical outcomes.

This is the first Nepalese study assessing the association between satisfaction and perception of online learning among undergraduate nursing students, along with the perceived strengths, weaknesses, and improvement suggestions. We used prevalence ratios for more accurate association estimates, as odds ratios can overstate effects in cross-sectional studies.[21]

No male students were enrolled at KUSMS during data collection, and we excluded intermediate and postgraduate nursing students due to the varied online class structures across different programs. Therefore, the findings generalize only to bachelor-level female nursing students. We assessed student satisfaction using a single statement, which may not capture all aspects of satisfaction. The

cross-sectional design prevents causal inference; however, a comprehensive assessment of positive and negative perceptions using both closed and open-ended questions regarding online learning provides insights into their potential influence on satisfaction.

CONCLUSION

Undergraduate nursing students at KUSMS with positive perceptions were more likely to be satisfied with this teaching modality. They viewed online learning as an innovative, effective, and flexible medium, and noted enhancements in their technical and communication skills. Universities should adequately train faculty and students in digital tools, use interactive multimedia to boost engagement, implement virtual simulations for clinical training, collect and act on student feedback, and ensure access to stable, subsidized internet. These strategies can foster a positive perception and enhance students' satisfaction, making online learning a viable alternative or complement to traditional education.

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Effect of Perineal Warm Packs on Perineum on Second Stage of Labour among Primiparous Women at Dhulikhel Hospital, Nepal

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ABSTRACT

Background

Perineal warm packs are widely used during childbirth in the belief that they reduce perineal trauma and reduce the episiotomy during the late second stage of labour.

Objective

To determine the effect of perineal warm packs on perineum during second stage of labour among primiparous women.

Method

A quasi-experimental study design was used. The total sample size for this study was 88 primiparous women and were divided in warm pack group (n=44) and the standard care group (n=44). Consecutive sampling technique was used for data collection. Both descriptive and inferential statistics (Chi-square, Independent t-test, FET) were used for data analysis.

Result

Mean age of the warm pack group was 22.80 (± 1.54) years and the standard care group was 23.11 (± 2.71) years. There was a statistically significant difference between the application of a warm pack and the degree of the perineal tear (p-value 0.01). However, there was no significant association between the duration of the second stage and perineal condition.

Conclusion

The study concluded that perineal warm packs had a good outcome in reducing the perineal tear but had no effect on maintaining intact perineum.

KEY WORDS

Childbirth, Perineal trauma, Perineal warm pack, Second stage of labour

INTRODUCTION

Perineal trauma is the most common complication that occur during the second stage of labour either spontaneous or induced (episiotomy) in childbirth.[1] It is known to be more common in primiparous women.[2] It can make activities of daily life difficult as sitting, voiding, self- care, care of baby including breastfeeding; also lead to relationship disharmony and sexual disorders resulting irritability, resentment, depression and maternal exhaustion.[3] Perineal preservation and comfort during second stage of labour are important goals in the midwifery practice.[4] Each year approximately more than 60,000 women die due to complication during pregnancy and childbirth.[5]

Finding ways to reduce perineal trauma would offer benefits in terms of physical, emotional and financial costs. Warm compress is a simple, feasible, non-invasive, safe, effective procedure. It can be applied even in a rural setting. Though many pieces of research had shown perineal warm packs as beneficial, it has still not been in practice and there is little knowledge regarding such intervention in a developing country like Nepal.[6,7] So the current trial was designed to determine the effect of perineal warm packs on the perineum on the second stage of labour among primiparous women.

METHODS

This is a quasi-experimental study conducted in the labour room of Dhulikhel Hospital, Kavre, Nepal. The study was carried out from 1st November to 20th December 2019. The target population was all the primiparous women admitted to the labour room for normal vaginal childbirth. The sample size was calculated as 44 individuals in each group with a 95% confidence interval and study power of 90% using formula

$$n = (1)\ (z_1 - \alpha_2 + z_1)^2\ [p_1\ (1 - p_1) + p_2\ (1 - p_2)]/(p_1 - p_2)^2 = 44$$

A total of 100 women were approached for this study. Twelve women were excluded from not meeting the inclusion criteria.

Consecutive sampling was used as the sampling technique. A total of 88 eligible pregnant women were taken for the study. The first participant was allocated by using lottery methods to choose either a warm pack group or a standard care group.

Inclusion criteria were: primiparous women of gestational age 37-40 weeks; singleton pregnancy with cephalic presentation; anticipated a normal birth and those who are willing to participate. Women who had forceps or vacuum delivery, caesarean section, big baby and experienced foetal and maternal distress were excluded from the study. A structured questionnaire and observation technique were developed through literature review, different research guidelines and seeking the opinion of the research advisor and subject experts. The tool was divided into two parts. Part I of socio-demographic characteristics and obstetric variables. Part II of assessment tool of the second stage and perineal outcome obtained from the birth record chart.

Ethical approval was taken for the Institutional Review Committee (protocol approval number 29/19) and Post Graduate Committee of Kathmandu University School of Medical Sciences. Verbal and written permission was taken from the Head of Department of Gynaecology and Obstetrics of Dhulikhel Hospital. Informed written and verbal consent was obtained from each participant.

The pre-test was conducted in 10% of the participants and were excluded from main study. The validity of the procedure and questionnaire was maintained by reviewing the related literature, consulting preceptor , seeking the opinion of subject experts for the relevancy and consistency.

Clear protocols regarding the warm pack application were made available in the labour room. Before the actual intervention, two class sessions were organized regarding application of perineal warm packs through interactive discussion and using the video of warm pack application.

Women in the warm pack group received the warm pack during contraction on the late stage of labour when the head was stretching the perineum until childbirth. A sterile bowl was filled with boiled water with temperature 45 degree Celsius using mercury thermometer. The temperature was monitored constantly and maintained same by the researcher herself throughout the procedure in all participants of warm pack group to maintain the reliability of the experiment. A sterile peri-pad was soaked with warm water, and then it was placed gently on the perineum during contraction. When the contraction got over, it was removed from the perineum and the peri-pad was resoaked to maintain warmth between contractions. When the pad got contaminated with the stool, it was replaced with the next pad to prevent the infection. This procedure was continued until the birth of the baby's head.

The minimum duration of the warm pack application was 15 minutes and the maximum duration was up to 30 minutes. When there was need to replace the water due to cooling (after around 15 minutes), the whole water was replaced to maintain the accurate water temperature. Women assigned to the standard care group received standard care as perineal support, emotional support and care as per their need. Those who needed episiotomy during the childbirth were not restricted in both group. After the childbirth, perineal tear was assessed in both group. The required information was obtained from the birth record sheet. Data collection was done by the researcher herself from 7am to 7pm in the labour room of Dhulikhel Hospital.

The collected data were coded appropriately, stored safely and entered manually into SPSS version 23. The data were checked for completion and accuracy. Descriptive and inferential statistics were used for data

analysis. Descriptive statistics (Mean, Standard deviation, Frequency, and percentage) was calculated for socio-demographic and obstetric related information. Inferential statistics (Chi-square, Independent t-test and Fisher Exact test) were applied for finding out the association between the application of warm packs and the degree of a perineal tear.

RESULTS

Table 1 depicts the socio-demographic characteristics of women. Mean age of the warm pack group was 22.80 (± 1.54) years and standard care group was 23.11 (± 2.71) years. In the warm pack group, 38.6% of women had basic and secondary education whereas in standard care group 45.5% of women had higher education. The 36 majority of warm packs group (88.6%) and standard care group (86.4%) were from medium economic status.

Table 1. Socio-Demographic Characteristics of Women (n=88)

Characteristics	Warm pack group (n=44)		Standard care group (n=44)	
Age(Completed years)				
Mean ± SD	22.80±1.549		23.11±2.713	
Education				
No education	1	2.3	1	2.3
Basic education	17	38.6	8	18.2
Secondary education	17	38.6	15	34.1
Higher secondary	9	20.5	20	45.5
Occupation				
Homemaker	32	72.7	19	43.2
Services	7	15.9	19	43.2
Other (Agriculture, Business)	5	11.4	6	13.6
Current residence				
Urban	32	72.7	31	70.5
Rural	12	27.3	13	29.5
Economic status				
High	0	0	4	9.1
Medium	39	88.6	38	86.4
Low	5	11.4	2	4.5
Birth weight (kg)				
≤ 3.5	35	79.5	40	90.9
> 3.5	9	20.5	4	9.1

Table 2 shows based on the perineal condition, 2.3% of the women had intact perineum; 63.6% had tear and 34.1% had episiotomy in warm pack group whereas there was no intact; 61.4% of the women had tear and 38.6% of the women had episiotomy in a standard care group. In terms of the degree of perineal tear, 47.7% of the women had a first-degree tear in the warm pack group and 38.6% of the women had a second-degree tear in the standard care group. There was statistically significant association between the degree of perineal tear and application of a warm pack (p-value 0.01). This shows second-degree tear is significantly more in the standard care group (38.6%) in comparison to the warm pack group (18.2%).

Table 2. Comparison of Delivery Outcomes in Intervention and Control Groups

Characteristics	Warm pack group (n=44)		Standard care group (n=44)		Test result
	Frequency (n)	(%)	Frequency (n)	(%)	p-value
Duration of the second stage (mins)					
Mean ± SD	38.14±27.11		39.84±29.18		0.46
Perineal condition					
Intact	1	2.3	0	0	
Tear	28	63.6	27	61.4	1.14
Episiotomy	15	34.1	17	38.6	
Degree of Perineal tear					
First degree	20	47.7	10	22.7	0.01*
Second degree	8	18.2	17	38.6	
Number of antenatal contacts (times)					
Mean ± SD	7.23±3.06		6.11±2.18		0.93

*p < 0.05

DISCUSSION

Childbirth is one of the most important periods in women's lives.8 So far to our knowledge, this is the first study carried out in Nepal to determine the effect of perineal warm packs on the perineum on the second stage of labour.

In the current study, the first-degree tears were most common among warm pack group compare to standard care group. Moreover, no third-and fourth-degree tears were detected in both groups. There was a statistically significant difference between the perineal warm compress and the degree of the perineal tear (p-value 0.01). This finding is consistent with other studies carried out in Egypt and Indonesia.[9,10] Further, Dahlen et al. and Aasheim et al. found that there was a significant effect of the use of warm compresses on the perineum.[11,12] Further another study shows warm compresses at the second stage of labour has a significant impact on decreasing obstetric anal sphincter injuries (third-and fourth-degree perineal tears).[13]

This study shows the mean duration of the second stage was 38.114 (± 27.211) and 39.84 (± 29.18) for the control group and standard group respectively. But these results were not statistically significant. Similar findings were found in the study conducted in Egypt and Australia.[9,14] On contrary, a study conducted in Saudi Arabia reported a significant difference in the duration of the second stage of labour among experimental and control groups (p-value 0.03).[15] They reported that warm perineal compresses had

possible benefits in shortening the duration of the second stage of labour.

Regarding perineal outcome, the present study showed that perineal warm compresses in the second stage of labour did not significantly reduce the spontaneous perineal tear or episiotomy when compared with a standard care group. It may be due to the parity as this study includes only primiparous women. If this study could have included both primigravida and multigravida women, it could have been more interesting to find out the status of the perineum. A study by Albers et al. shows the use of perineal warm packs neither increased nor decreased the overall rates of genital tract trauma when compared with the control group.[16]

There are some limitations to this study. Since all the participants were primiparous women, the effects of warm packs on women having subsequent births cannot be concluded. The researcher did not record the length of time the warm packs were applied to the perineum. The researcher was unable to conduct randomized controlled trial due to time limitation and small sample size.

CONCLUSION

This study concluded that perineal warm packs did not affect maintaining intact perineum. It had no statistically significant difference in reducing the rate of episiotomy in comparison to the standard care group. However, there was a statistically significant difference between the application of perineal warm packs and the degree of perineal tear.

The present study had some strengths. The study was conducted by the researcher herself to maintain uniformity in the procedure. The procedure was not harmful to the women during childbirth. It was accepted by the nurse-midwives as care during the second stage of labour.

Further research can be done among multiparous women to assess the effect of perineal warm packs in the second stage of labour. The protocol regarding the perineal warm pack application could be made available in the labour room. Also, further research can be done regarding perineal warm pack application to see the effects on pain during second stage of labour.

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Assessment of Quality of Life at Postpartum Period among Postnatal Women Visiting Tertiary Level Hospital, Nepal

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ABSTRACT

Background

Women undergo a series of physical, psychological, and social transformations, which may lead to diseases during postpartum. Although these symptoms are frequently regarded as transient or inconsequential, they appear to be associated with functional material impairment and with poor emotional status and quality of life.

Objective

To assess the quality of life of postnatal women and its associated factors during the postpartum period.

Method

A quantitative cross-sectional study was conducted from 1st of November to 31st of December, 2021. A total of 122 postnatal mothers visiting the Immunization clinic of Dhulikhel Hospital were enrolled for the study. A semi-structured questionnaire was used to collect socio demographic and maternal information, and a valid SF36 questionnaire was used to assess the quality of life (QoL). Data was collected through face-to-face interviews, and a convenience sampling technique was adopted. Descriptive statistics and inferential statistics were applied with a 0.05 level of significance.

Result

The mean age was 26.11 ± 4.05, and the majority of women belonged to the age group 26-30 (43.4%). The mean score of the mental component summary (MCS) was 73.86, which was higher than the physical component summary (PCS) 64.32 score. There was a significant association between physical health and occupation of women (p = 0.031), number of children (p = 0.004), and no perineal trauma at birth (p = 0.004). Similarly, women who have more than 1 child and who have not experienced perineal trauma during childbirth had a significant association with mental health status components of quality of life (p= 0.003, p= 0.01).

Conclusion

The mental health status of postnatal women had a better quality of life compared to their physical health. Women who were employed, working in agricultural fields, had more than one child, and no perineal trauma during childbirth, had a good quality of life during the postnatal period.

KEY WORDS

Postpartum period, Postpartum women, Quality of life

INTRODUCTION

The puerperal or postpartum period is a chronologically and individually variable period. During this period, women undergo a series of physical, psychological, and social transformations, which may lead to diseases. These changes are also directly affected by the stress caused by childbirth, the responsibility of caring for a newborn, and the changes in the daily routine.[1] During postpartum, women regularly report a series of physical symptoms such as fatigue, headache, dyspareunia, hemorrhoids, and pain at multiple sites. Although these symptoms are frequently regarded as transient or inconsequential, they appear to be associated with functional maternal impairment and with poor emotional status, leading to a low quality of life for these mothers.[2]

The Health-Related Quality of Life (HRQOL), as defined by the World Health Organization (WHO), refers to an individual's perception of their position in life, taking into account the cultural context and value systems in which they live and in relation to their goals, expectations, standards, and concerns.[3]

Study conducted in different parts of world showed that various factors contributing to quality of life of postnatal mothers such as hormonal imbalances, social roles and responsibilities, types of delivery, complications during pregnancy and childbirth, physical and psychological problems during postpartum period such as pain, fatigue after childbirth, breast feeding problem, dyspareunia cause marital conflicts, postnatal depression and economic hardship of family etc.[2,4-11]

Studies conducted in Nepal also mentioned that different associated factors are related to low (quality of life) QoL of postnatal mothers, such as caesarean delivery has low QoL than ND, family type, education, occupation, which are varied from one study to another, which is inconclusive to mention exact predicting factors of low QoL of postnatal mothers in this part of Nepal.[12,13] The objective of the study was to assess the quality of life of postnatal women and its associated factors during postpartum period.

METHODS

A quantitative, descriptive cross-sectional study was conducted among postpartum women. The ethical approval was obtained from IRC, KUSMS (179/2021), and informed consent was taken from all the participants before enrollment in the study. Study was conducted between November- December 2021. Postnatal mothers who met the inclusion criteria, such as those who were visiting immunization clinic of Dhulikhel Hospital, who gave vaginal birth within 45 days of childbirth, were selected, and convenience sampling technique was used to enroll the participants.

Data collection was done with face-to-face interviews using the SF-36 (short form health survey questionnaire), a generic scale (composed of 36 questions items that provide a profile of the state of health and is applicable to both patients and the general population). It has been useful to assess health-related quality of life (HRQOL) in the general population. The Nepali version of the SF-36 questionnaire has a validity and reliability test Cronbach's alpha score of 0.85, which was adopted in this study.[14] Pre-testing was done with 10% of the total sample size among postnatal mothers attending the immunization care clinic of Dhulikhel Hospital (n=12).

Data analysis was done using SPSS version 20, and descriptive statistics was presented as mean, standard deviation, frequency and percentage for demographic characteristics, obstetrics characteristics, and HRQoL score. Inferential statistics such as chi-square test was used to determined the association between HRQoL and selected variables. A significance level of 0.05 was set for all tests.

Health Related Quality of Life, SF 36 questionnaire, which was mainly divided in two measure categories as physical health and mental health of QoL, which contents 8 dimensions, four in each category such as general health, limitation of activities, physical health problems, emotional health problems, social activities, pain, energy/fatigue, emotional well-being within the past four weeks duration.

Used the SF-36 questionnaire to calculate the mean score on 8 dimensions (all questions are scored from 0-100). The scores were combined and weighted on two scales as Physical component summary (PCS) and mental component summary (MCS), then the mean was calculated and above the mean was taken as good quality of life and anything below the mean was taken as poor quality of life of the postnatal mother. The scores from those questions that address each specific area of functional health status are then averaged together for a final score within each of the 8 dimensions measured.

RESULTS

The mean age of the women was 26.11 ± 4.05, the majority of the women were age between 26 to 30 years 43.4%. Similarly, more than half of them had secondary level education, 55.7%, more of them were home maker, 69.7% and 57.4% of them have two children. Only 38.5% of women had co-morbidity during the last pregnancy and 84.4% had experienced perineal trauma during childbirth (Table 1).

Table 2 shows different dimensions of physical and mental health. In physical health, bodily pain had highest mean score, 68.30 ± 22.10 and role functioning had least mean score, 55.12 ± 38.82. In converse, role functioning score had a high mean of 85.51 ± 30.29 and vitality had less mean score of 57.66 ± 17.37 in mental health.

The mean score of mental health components summary was 73.86 ± 13.92, which is high compare to the physical health components summary 64.32 ± 15.81.

Table 1. Socio-demographic and Obstetric Characteristics of the Postpartum Women (n=122)

Characteristics	Frequency (f)	Percentage (%)
Age Mean ± SD 26.11 ± 4.05		
≤ 20 years	11	9.0
21 - 25 years	44	36.1
26 - 30	53	43.4
31 - 35	12	9.8
> 35	2	1.7
Level of Education		
Primary	26	21.3
Secondary	68	55.7
Higher	28	23.0
Occupation		
Homemaker	85	69.7
Service Holder	21	17.2
Agricultur	16	13.1
Parity		
1	70	57.4
> 1	52	42.6
History of Co-morbidity in Pregnancy		
Yes	47	38.5
No	75	61.5
Perineal Trauma		
Yes	103	84.4
No	19	15.6

Table 2. Dimensions of Quality of Physical and Mental Health among Postnatal Women (n=122)

Dimension	Mean	Standard Deviation
Physical Health		
Physical functioning	65.86	13.93
Role functioning	55.12	38.82
General health	66.92	15.62
Bodily pain	68.30	22.10
Physical Component Summary (PCS)	**64.32**	**15.81**
Mental health		
Vitality (Energy and fatigue)	57.66	17.37
Role Functioning/Emotional	85.51	30.29
Emotional well being	80.85	12.97
Social functioning	71.41	25.28
Mental Component Summary (MCS)	**73.86**	**13.92**

The quality of life score of physical health showed that half of the women had a poor quality of life during postpartum, 51.6%. Similarly, more than half of the women had good mental health quality of life, 59.8% during the postpartum period (Table 3).

Table 4 shows the association of physical and mental health status with different socio-demographic and maternal health variables. In Physical health, women who had more than one child and who did not experience perineal trauma during childbirth had a good quality of physical health, which was statistically significant with a p-value of 0.004 in both. Similar findings were shown in the quality of mental health, where having more than one child p=0.003, and the absence of perineal trauma p=0.01 were significantly associated with better mental health status.

Table 3. Quality of Life Score of Physical and Mental Health Component of Postnatal Women (n=122)

Variable	Frequency	Percentage
Physical Component Summary (PCS)		
Good Quality	59	48.4
Poor Quality	63	51.6
Metal Component Summary (MCS)		
Good Quality	73	59.8
Poor Quality	49	40.2

Table 4. Association between Quality of Life of Postpartum Physical, Mental Health Component Summary with Socio Demographic and Obstetrics Characteristics (n=122)

Variables	Physical Component Summary			Mental Component Summary		
	Good quality n(%)	Poor quality n(%)	p-value	Good quality n(%)	Poor quality n(%)	p-value
Age						
≤ 26 yrs	33 (55.9)	26 (44.1)	0.105	33 (55.9)	26 (44.1)	0.395
> 26 yrs	26 (41.3)	37 (58.7)		38 (62.3)	23 (37.7)	
Level of Education						
≤ 12 yrs	45 (47.9)	49 (52.1)	0.843	56 (59.6)	38 (40.0)	0.914
> 12 yrs	14 (50.0)	14 (50.0)		17 (60.7)	11 (39.3)	
Occupation						
Homemaker	35 (41.2)	59 (58.8)		45 (52.9)	40 (47.1)	
Service	12 (57.1)	9 (42.9)	0.031	15 (71.4)	6 (28.6)	0.052
Agriculture	12 (75.0)	4 (25.0)		13 (81.3)	3 (18.7)	
Number of children						
1	26 (37.1)	44 (62.9)	0.004	34 (48.6)	36 (51.4)	0.003
> 1	33 (63.5)	19 (36.5)		39 (75.0)	13 (25.0)	
Co-morbidity in pregnancy						
Yes	23 (48.9)	24 (51.1)	0.920	27 (57.4)	20 (42.6)	0.670
No	36 (48.0)	39 (52.0)		46 (61.3)	29 (38.7)	
Status of Perineal Trauma						
Yes	44 (42.9)	59 (57.3)	0.004	46 (44.7)	57 (55.3)	0.018
No	15 (78.9)	4 (21.1)		16 (84.2)	3 (15.8)	

DISCUSSION

The findings of the study showed that the mean score of the quality of mental health component summary (MCS) was 73.86, which was higher than the mean score of the quality of physical health component summary (PCS) during the postpartum period. This finding was similar to the study conducted in 2014 in Nepal and India.[5,13] Similar findings were observed in studies conducted in Ethiopia and the Netherlands, as the MCS score was high compared to the PCS score. However, both the scores MCS and PCS were lower compared to the present study.[4,6] In contrast, another study conducted in Ethiopia had shown that the PSC mean score was higher than the mental health component summary (MCS).[7] In this study mental health score is more than the physical health of postpartum women. This might be related to the social and cultural care and support provided to women during the postpartum period.

This study revealed that the mean score of physical functioning was similar to a study conducted in Ethiopia as 68.10.[7] However, higher mean scores were found in studies done in Spain and Pakistan.[8,15] In contrast, a lower mean was found in studies conducted in Iran and Ethiopia.[6,16] Regarding role limitation due to physical problems had the least mean score was found compared to other physical components; a similar finding was found in studies done in Ethiopia, India, and Pakistan.[5,7,15] Conversely, report seen in study conducted in Spain.[8] This is the most affected domain of physical health where postnatal mothers are facing different physical complaints of fatigue, pain, unable to perform other activities due to a suture in the perineum, which was statistically significant (p=0.004).

The overall mean score of mental health components was higher than physical health in this study. Among mental health components, role functioning due to emotional problems had the highest score, which was similar to the study conducted in India.[5]

However, lower score was presented in study conducted in Iran, Ethiopia and Pakistan.[6,15,16] Study revealed that the lowest mean score was obtained from vitality (energy and fatigue), similar findings were observed in studies conducted in Bangalore, India, and Pakistan.[9,15,17]

The women with more than one delivery may be familiar with the changes during pregnancy and after delivery and more likely to improve their physical performances, which is supported by this study showing that there is a significant association between postpartum physical health and number of children (p=0.004). This finding is again supported by the study conducted by Park et al. in Korea, which showed that there was a significant association between health-related quality of postpartum women and the number of children.[18] This study is in contrast with the study conducted in Ethiopia and in the Netherlands, which showed that there is no significant association between postpartum physical health-related quality and number of children, p=0.160 and p=0.25, respectively.[4,7] Similar finding was revealed by studies conducted in Ethiopia, Pakistan, and Kazakhistan that there was an insignificant association between HRQoL and the number of children.[6,10,15] Moreover, a study conducted in India mentioned that birth order two had shown the best mean HRQoL score, 67.7 ± 17.1. In contrast, the birth order of more than three children had the worst mean score, which was statistically significant.[5]

Studies have shown that significant association between physical health and the occupation of postpartum women. Women who were working in the field (agriculture) and service holder had good quality of physical health than home maker. This study showed that there is a significant association between physical health and the occupation of postpartum women. This finding is supported by the study conducted by Nazanin R in Iran, which showed that there is a significant association between health-related quality of postpartum women and occupation (p=0.03).[2]

Women who were working in the field (agriculture) and service holder had good quality of physical health than home-maker. A similar finding was reported in a study conducted in Pakistan that significant difference between employed women and housewives (p=0.027).[15] However, a study conducted in Kazakhstan mentioned that there was no significant association between HRQoL and the occupation of women.[10]

This study showed that there is a significant association between physical health and perineal trauma in postpartum women. Moreover, studies conducted in Ethiopia and Kazathistan mentioned that there was no significant association between HRQoL and complications during and after childbirth.[6,10] A study conducted in India mentioned that complications during antenatal, intranatal, and postnatal had poor mean HRQoL, even worse HRQoL score in the intrapartum period.[5]

This study showed that there is a significant association between postpartum mental health and the number of children (p=0.003). This study is in contrast with the study conducted by Tola et al. Arba Minch Ethiopia, which showed an insignificant association between health related quality of postpartum women and the number of children given birth.[7,15]

CONCLUSION

Postpartum women's physical and mental health-related quality of life is moderately affected during the postnatal period. Women who have more than one child, who didn't experience perineal trauma during childbirth, and employed women have a good quality of life compared to primiparous women and women who have a history of perineal trauma during childbirth. Care during prenatal and childbirth affects the quality of life of women during postpartum. So, it is recommended that special care be provided to those

women who are mothers for the first time, and trauma be minimized during childbirth to increase the quality of life of these postnatal women. Further longitudinal study is recommended to identify cause and effect relationship of the quality of life of postnatal women.

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Sexual Health of Women after Childbirth: A Qualitative Study

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ABSTRACT

Background

A Woman's sexual health is essential to both physical and emotional well-being. Postpartum sexuality is influenced by various factors, including psychosocial aspects of sex and intimacy, body image, evolving perceptions of sexuality, and changing relationship dynamics. Despite the significant impact of these factors, sexual health issues are often neglected by healthcare professionals, and there is limited research on the lived experiences.

Objective

To explore women's experiences of changes to their sexual relationship, sexuality and intimacy after childbirth.

Method

In this qualitative study, In-depth, face to face interviews were conducted with nine postpartum women attending the outpatient department of a tertiary level Hospital.

Result

Participants in this study described a significant shift in their roles, with the demands of motherhood taking priority over their identity as a partner, often leading to emotional strain and difficulties in maintaining intimacy. Sexual desire was commonly altered, with some women experiencing reduced interest and unfamiliar emotional responses. Sensations of sexual pleasure also changed, influenced by both physical changes and body image concerns. Although, few women reported heightened pleasure. Relationships with husbands were affected in varying ways- some couples grew closer through emotional support while others faced emotional distance and insecurity. Resuming sexual intercourse posed additional challenges as women encountered physical discomfort and psychological barriers that impacted their readiness and confidence.

Conclusion

The findings highlight the importance to address woman's postpartum sexual health by healthcare professionals. This involves providing comprehensive information that aligns with women's expectations on sexual relationship, intimacy and parenting after childbirth. Overall, the study underscores the need for increased awareness and tailored support to address the sexual and relational changes women experience during the postpartum period.

KEY WORDS

Sexual health, Postnatal women, Postpartum, Childbirth

INTRODUCTION

The World Health Organization defines sexual health as a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free from coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled."[1]

After childbirth, women experience significant challenges related to changes in sexuality, adjustments in the relationship with their partner, shift in roles changes from being a partner to becoming a mother, sex, and intimacy. Pregnancy and childbirth represents the time of transition, where women face a deep transformation of their lives and their relationships due to change in the relationship dynamics.[2-4]

Postpartum sexuality can be influenced by various factors including; psychosocial factors affecting sex and intimacy, body image, an evolving view of sexuality and changing intimacy.[5] Despite the significant impact of these factors, sexual health issues are often missed out by healthcare professionals, and there are limited studies on the lived experiences, as well as social and cultural influences that shape sexuality and intimacy.[6]

Therefore, this qualitative study aims to explore the sexual health of women attending the immunization and family planning clinics in out- patient department of Dhulikhel hospital after childbirth in relation to their experiences of changes to their sexual relationship, sexuality and intimacy because of childbirth.

METHODS

This qualitative study was conducted to explore lived experiences of women after childbirth in the immunization and family planning clinics in out- patient department of Dhulikhel hospital among nine postnatal women from six weeks after childbirth to one year, aged eighteen completed years of age (reproductive age), who had a healthy baby with normal vaginal birth and caesarean section, mixed parity, in a sexual relationship with their husband, who could speak and understand Nepali language and willing to participate.

Ethical clearance was obtained from nursing faculty, head of Gynecology, Obstetrics Department, Institutional Review Committee of Kathmandu University School of Medical Sciences, Dhulikhel hospital (IRC approval number: 206/19) and the Post Graduate Committee to conduct the study.

In-order to protect the ethical rights of the participants, confidentiality, anonymity and voluntary participation was ensured. After providing the information on nature of the study, informed written and verbal consent was obtained from the participants and for time duration and to record the interview. Confidentiality was maintained by providing code numbers for each participant's interview and data were used only for study purposes. Considering the Covid-19 pandemic, all the necessary precautions for the safety of study participants and research was done by maintaining physical distance, wearing mask, face shield and washing hands.

Women were selected purposively to participate in the study. A total of 18 eligible women were invited for this study on the basis of the inclusion criteria. In-depth interviews were taken until the data saturation was perceived. Data saturation was perceived on eighth interview. However, one more interview was taken for credibility. A total of 18 women were eligible to participate in the study, However, after describing the nature of the study nine women refused to participate in the interview due to following reasons: three of them refused to provide time, two of them had no companion to hold the child, one of them was feeling shy and awkward, one of their husband was angry at the woman for talking about such private and sensitive issue. So, she refused to give the interview and two of them refused to give interview (did not respond to the call). Therefore, a total of nine women participated in this study.

In-order to conduct in-depth face-to-face interviews, a topic guide was developed by the authors. This guide was the result of conducting four mock interviews to refine and finalize the questions. The questions were developed under two headings: socio demographic data and grand tour questions.

Since the study was on sensitive topic, they commenced with an introduction and definition of sexual health and its importance for rapport building and usually lasted for about 10 to 15 minutes prior to the interview. The duration of interview ranged from 30 to 45 minutes.

Manifest content analysis guided by Graneheim and Lundman was performed for data analysis by the authors.[7] The audio tapes were listened repeatedly and were transcribed verbatim in Nepali (local language). Later, it was read several times to become familiar with the interviews and to extract manifest meanings from them. The meaning units were identified, the identified Nepali meaning units were translated into English meaning units. Furthermore, the condensed meaning units were derived. The combinations of interpreted condensed meaning unit were labeled with a code. The codes were sorted into the sub category based on similarities and differences. Lastly, the categories were extracted. The analysis was done together with the second author, where sub-categories and categories were discussed until the common agreement was reached. All the analysis was performed manually.

RESULTS

Table 1 shows the data from the study have generated the five categories which were extracted from several sub-categories.

Table 1. Women's Responses Divided into Categories and Sub-categories

Categories	Sub- categories
Shifting of role	• Changed focus • Adjustment difficulties
Sexual desire after childbirth	• Strange feelings • Altered sexual desire
Changes in sensation of sexual pleasure	• Body integrity • Height in sexual pleasure
Relationship with husband after child-birth	• Supporting the partner • Feeling of insecurity in relationship • Factors for change in the relationship
Challenges/ Issues during resumption of sexual intercourse	• Physical barriers • Mental barriers

Category 1: Shifting of role: Changed focus and Adjustment difficulties

Most of the participants reported feeling a stronger attachment to their newborns, with their priorities shifting toward their children. Sleeping separately due to fear of the baby being crushed in between the two parents after childbirth which in turn impacted their sexual intimacy and attraction. As one participant said, *"Before, we both used to sleep together as we were only two and now after the birth of baby, the baby is very little so I have to make him sleep with me otherwise he might get crushed in between. So, we sleep separate now."* P4, 22 years

First-time mothers, on the other hand, experienced challenges in adjusting to their new roles and circumstances but gradually adapted over time.

One of the women said, *"It was very difficult for me in the beginning. I had to look after the baby. I could not manage that. The baby was not fine with others. It took half an hour to make baby sleep. I could not give time to other family members and for husband. It was like that. As the time passed, I had an adjustment gradually."*

Category 2: Sexual desire after childbirth: Strange feeling and Altered sexual desire

Some participants reported fear of pain at the wound site (repair of episiotomy or perineal tear) during sexual intercourse, which affected their sexual desire. Others expressed reluctance to engage in sex due to feelings of unhappiness and discomfort during intercourse. Additionally, many participants noted a decrease in sexual desire and intimacy, citing factors like fatigue, exhaustion, and sleeping separately.

As one woman said, *"Now I have wounds. I am scared if it separates apart during sexual intercourse."*

Another participant said *"The baby bothers me all day long and it's difficult. So, I feel sleepy and I am upset when my husband asks me for that (sex) when I am sleepy."*

Category 3: Changes in the sensation of sexual pleasure: Body integrity and height in sexual pleasure

Some participants shared feeling dissatisfied due to vaginal looseness, while others mentioned that their sexual pleasure increased following childbirth. While other participants described experiencing heightened sexual pleasure after childbirth.

As one participant said, *"Last time after delivery, I felt that the vagina was somewhat loose. So, I was not satisfied with that (during sexual intercourse)."* P6, 22 years

Another woman said, *"Whatever, I feel very light. I feel like reaching somewhere and pleasure in different way and reaching somewhere."* P9, 31 years

Category 4: Relationship with husband after childbirth: Supporting the partner, factors for change in the relationship and feeling of insecurity in relationship

Some participants shared that their husbands were supportive, with mutual agreements to refrain from sex to prevent potential health problems for the woman. As one participant said, *"In-order to prevent from future obstacles occurring in health, during that interval, we said that after delivery to 3 months, we had an agreement not to do (sexual intercourse) but sometimes I had that feeling (sexual desire). Also, we can wait for such thing."* P1, 27 years

The majority of participants expressed feeling insecure in their marriages, often feeling pressured to engage in intercourse due to fears of their husband's infidelity. Another participant said, *"I feel like if my husband sees somewhere else? If he goes (to another woman)? If he sees some other girl (woman). So, I don't deny (to have sexual intercourse).* P7, 23 years

Category 5: Issues during resumption of sexual intercourse: Physical barriers and mental barriers

Most participants described experiencing difficulty during intercourse in the early stages after childbirth: birth-related trauma and a feeling of vaginal looseness. Some also mentioned fearing the possibility of injuring the wound during sexual activity.

As one of the participants said, *"When I resumed (sexual intercourse) it's not like before and it was difficult too. I felt little loose (vagina) after the childbirth."* P6, 22 years

Another participant said, *"sometimes I felt like the wound will hurt and I thought in my heart that, if the inside repaired part is touched then it will get separated apart. But sometimes I did not feel so (during intercourse)."* P3, 25 years

DISCUSSION

Among the study participants, most of their sexual intimacy and attraction decreased because of the changed focus of their relationship after childbirth. Whereas, the first time mothers had difficulty in adjustment to their transition to motherhood.[8,9]

The findings revealed that the factors contributing to the change in sexual responses were; tiredness, fatigue and lack of sleep which is similar to the study conducted in Spain.[10] Moreover, the sexual intimacy between the couple seemed to be greatly affected due to vaginal soreness or dyspareunia and the physical pain associated with sexual intercourse likely to result in decreased sexual desire.[8]

A qualitative study conducted in South Carolina echoes to the findings of this study indicating that the childbirth developed a new perspective and improved sexual function by making them feel more comfortable. Whereas, the fluctuation of sexual desire was another common finding.[11]

Majority of the women in the present study described decreased sexual pleasure following childbirth that is influenced by the presence of perineal trauma as suggested in several previous studies.[8] Some participants shared a feeling of being dissatisfied due to vaginal looseness. Additionally, some participants described experiencing heightened sexual pleasure after giving birth.[11,12]

The study findings are in correspondence to the previous study where it describes; returning to sex was difficult and painful for most of the participants due to fear of pain discomfort and mentally unprepared to resume sex.[11,13] Some participants shared that their husbands were supportive, with mutual agreements to refrain from sex to prevent potential health problems for the woman.

While majority of participants expressed feeling insecure in their marriages, often feeling pressured to engage in intercourse due to fear of their husband's infidelity. In some of these cases, they also pretended to have felt desire and had an orgasm.[14]

However, it may have been difficult for the participants to talk openly about sexual matters. So, it is assumed that not all the details are included in the data.

CONCLUSION

The study revealed that childbirth significantly impacts women's sexual relationships and intimacy. Some women experienced a decrease in sexual desire and intimacy, feeling insecure and vulnerable in their relationships. Therefore, they tended to maintain the relationship by prioritizing their partner's perspective over their own. In contrast, other women felt a sense of empowerment and increased confidence, which strengthened the connection with their partners.

Based on these findings, the study emphasizes healthcare providers to address postpartum sexual health. This includes meeting women's expectations for guidance on topics such as sexual activity during pregnancy, appropriate timing and positions for intercourse, baby care, parenting, resumption of sexual relations after childbirth and family planning.

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Maternal Antenatal Attachment among Pregnant Women Attending Antenatal Clinic of Tertiary Level Hospital

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ABSTRACT

Background

Antenatal Attachment refers to the emotional connection that begins, creating an imagined relationship between mother and her developing fetus. This emotions of attachment motivates the pregnant woman to nurture, protect, show compassion, be sensitive to its needs and engage through expressions of love and interest.

Objective

To assess the level of maternal antenatal attachment among pregnant women attending antenatal clinic of tertiary level hospital.

Method

A cross-sectional study was conducted among 356 pregnant women in Dhulikhel hospital. Sample were selected by using convenience sampling technique. The Maternal Antenatal Attachment Scale (MAAS) was used to assess the maternal antenatal attachment. Data were collected using a self-administered questionnaire and analyzed with STATA 13. Data were analyzed using descriptive statistics (mean, standard deviation, frequency and percentage) and logistic regression was applied for inferential statistics.

Result

More than half (56.5%) of the pregnant women had a low level of maternal antenatal attachment. Pregnant women's education level, occupation, trimester, history of abortion and number of children were statistically significantly associated with level of maternal antenatal attachment (p-value < 0.05).

Conclusion

The low level of maternal antenatal attachment was observed among pregnant women. The most significant factors associated with antenatal attachment were education level and gestational age. Therefore, effective intervention programs are needed to provide information and support to enhance antenatal attachment.

KEY WORDS

Attachment, Maternal antenatal attachment, Pregnancy

INTRODUCTION

Maternal-fetal attachment, an intangible relationship between a mother and her fetus that is believed to be a crucial component of foetal development.[1,2] Adapting to motherhood is a potentially stressful process, and can cause pregnant woman to experience both positive and negative emotions.[3] Some research indicates that pregnant women who have lower levels of Maternal fetal attachment are more likely to give birth to infants who have poor neonatal outcomes, like low birth weight and preterm.[4]

Approximately 75-80% of pregnant women experience maternal-fetal attachment during pregnancy.[5] In a study, it was found that 38.6% of mothers have low prenatal attachment and when the attachment level is low, the fetus is more in risk.[6] Adverse maternal-neonatal outcomes, such as depression during pregnancy and after delivery and impaired cognitive, behavioral, and emotional development of the child as well as premature birth, might result from poor mother-fetal attachment.[7]

Numerous studies indicate that women who have insecure attachment during pregnancy could be at a higher risk for postpartum depression. Additionally, women with weak emotional bond with their unborn child are more likely to experience feelings of irritation towards the fetus and may have a greater propensity to feel the urge to harm or discipline the fetus.[8]

Limited research has been carried out in Asian countries regarding this topic. This study aimed to assess the maternal antenatal attachment among pregnant women attending antenatal clinic of tertiary level hospital.

METHODS

The analytical cross-sectional study was conducted at the Antenatal Care Outpatient Department (OPD) of Dhulikhel Hospital from 13th July and 24th August. A total of 356 pregnant women aged 18 and above, who were in 2nd and 3rd trimester and meeting the inclusion criteria were included in the study.

The sample size was calculated using a standard formula $n= z^2pq/d^2$ based on a previous proportion (70%) of maternal attachment, and a 10% non-response rate was added. The convenience sampling technique was applied. Data were collected using a self-administered questionnaire, which consisted of three parts: socio-demographic information, the obstetric information and the level of maternal antenatal attachment that was measured by maternal antenatal scale (MAAS). The tools were translated into Nepali and validated by experts. The MAAS is a Likert-type scale with 19 items having a score between 1 and 5 attributed to each item (where 5 represents very intense feelings and 1 represents the absence of feeling). The minimum score for the total MAAS is 19 and the maximum is 95, with higher score indicating a high level of attachment. Eleven items (1, 3, 5, 7, 9, 10, 12, 15, 16, and 18) were reverse scored. Scores ≤ 75 were categorized as a low level of attachment and above 75 is considered as high level of attachment.[9]

Pre-testing was conducted among 10% of the sample i.e. 36. The reliability of the tools was assessed, with a Cronbach's alpha 0.79 indicating good internal consistency.

Prior data collection, the ethical approval was obtained from Institutional Review Committee (IRC), KUSMS (IRC approval number 173/23) and PG (postgraduate) committee of Kathmandu University School of Medical Sciences. Furthermore, formal and written approval was taken from Head of Department of obstetrics and gynecology and verbal permission was taken from Nurse Manager/Incharge of Department of Gynecology and Obstetrics ANC Clinic of Dhulikhel Hospital. Informed consent was taken from the participants, ensuring confidentiality and voluntary participation. The collected data was accessible only to the researchers.

Data entry was done in Microsoft Excel, and analyzed in STATA version 13. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used. For inferential statistics, bivariate and multivariate logistic regression analyses were performed, with a significance level set at p-value < 0.05.

RESULTS

Table 1 represents socio demographic characteristics of women. Majority (32.3%) of respondents were in the age group of 18-23 years with mean age of 6.08 ± 5.37 SD. Regarding the educational status of the respondents, 61.2% had more than secondary level education. 69.1% were homemaker and few numbers of those (6.5%) were involved in other occupation like student and business. Similarly, 100% of the respondents were married.

Table 1. Socio-Demographic information of pregnant women (n=356)

Characteristics	Frequency	Percentage
Age (Years)		
18-23	115	32.3
24-29	92	25.8
30-35	106	29.8
35 and above	43	12.1
Mean ± (SD) 26.08 ± (5.3)		
Educational level		
Basic education	56	15.7
Secondary level	82	23.1
More than secondary	218	61.2
Occupation		
Homemaker	246	69.1
Agriculture	45	12.6
Service	42	11.8
Others (student, business)	23	6.5

Table 2 shows the obstetric related characteristics of the respondents, where 50.2% of the respondents were primigravida women. 53.4% of respondents had no any number of children. Regarding trimester, 67.7% of respondents were in third trimester, 75.3% of respondents had no health problems during pregnancy, 91% respondents had no history of abortion. Similarly, no any respondents had history of IUFD.

Table 2. Obstetrics Information of pregnant women (n=356)

Characteristics	Frequency	Percentage
Gravidity		
Primigravida	181	50.8
Multigravida	175	49.2
Number of children		
No	190	53.4
One	147	41.3
Two or more	19	5.3
Trimester		
Second	115	32.3
Third	241	67.7
Planned pregnancy		
No	84	23.6
Yes	272	76.4
Health problems during pregnancy		
No	268	75.3
Yes	88	24.7
Abortion history		
No	324	91.0
Yes	32	9.0

Figure 1 shows the level of maternal antenatal attachment of the respondents where 56.5% of the respondents had low level of attachment and 43.5% of the respondents had high level of maternal antenatal attachment.

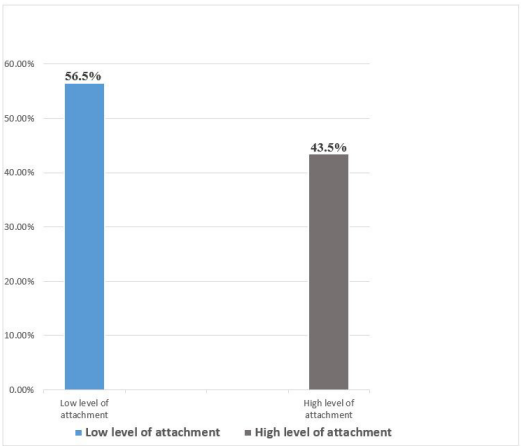

Fig. 1. Level of maternal antenatal attachment

Table 4 shows the univariate analysis between selected variables and maternal antenatal attachment. It shows that there was a statistically significant association between education, occupation, trimester and abortion history with maternal antenatal attachment ($p < 0.05$).

Table 4. Association between selected variables and Maternal antenatal attachment (n=356)

Characteristics	*COR	95% CI	P value
Age	0.98	0.94 to 1.02	0.412
Education level			
Basic level	Ref	-	-
Secondary level	16.61	5.49 to 50.23	**< 0.001**
More than secondary	12.07	4.22 to 34.55	**< 0.001**
Occupation			
Homemaker	Ref	-	-
Agriculture	2.78	1.45 to 5.33	**0.002**
Service	7.46	3.41 to 16.35	**< 0.001**
Others	3.81	1.55 to 9.37	**0.003**
Trimester			
Second	Ref	-	-
Third	2.87	1.77 to 4.65	**< 0.001**
Health problems			
No	Ref	-	-
Yes	1.41	0.87 to 2.29	0.160
Abortion history			
No	Ref	-	-
Yes	2.33	1.10 to 4.93	**0.027**

Note: The bold P values indicate statistically significant differences.
*COR: crude odds ratio

Table 5 illustrates the multivariate logistic analysis after adjusted some variables like respondent's age, education and history of abortion. When the possible confounders were adjusted it was found that the level of the maternal antenatal attachment of the pregnant women was statistically significant with the number of children ($p < 0.05$).

Table 5. Association between selected variables and Maternal antenatal attachment (n=356)

Characteristics	*COR	95%CI	p-value	*AOR	95%CI	p-value
Gravidity						
Primigravida	Ref	-	-	-	-	-
Multigravida	0.71	0.47 to 1.09	0.124	1.14	0.58 to2.21	0.695
Number of children						
No	Ref	-	-	-	-	-
One	0.75	0.48 to 1.16	0.206	1.09	0.57 to2.10	0.777
Two or more	0.12	0.02 to 0.55	0.060	0.07	0.01 to0.40	**0.003**
Planned pregnancy						
No	Ref	-	-	-	-	-
Yes	2.01	1.19 to 3.38	**0.008**	1.32	0.72 to2.47	0.371

Note: The bold P values indicate statistically significant differences.
*COR crude odds ratio
*AOR adjusted odds ratio
*Multivariate model adjusted for respondent's age, education and history of abortion

DISCUSSION

Pregnancy is viewed as a period of increased emotional sensitive during mothers start to develop expectations and imagining about the fetus. This perception of the fetus as a human being increases the attachment that the pregnant woman has with it.[3]

The main aim of the study is to assess the level of maternal antenatal attachment and its associated factors. In the present study, the findings reveal that more than half of the pregnant women had low level of maternal antenatal attachment with the associated factors education, gestational age, history of abortion and number of children.

Higher education level among expectant mothers have been said to raise understanding of topics like the importance of a healthy pregnancy, its impact on the unborn child, and required medical procedures, or to encourage them to research these topics.[15] Our research revealed a statistically significant variation in the level of maternal antenatal attachment by educational attainment.

Several research in the literature indicate a connection between prenatal attachment and educational attainment. Higher educated pregnant women are believed to be more engaged in their unborn children as a result of these factors.[2]

As expected, gestational age showed positive association with maternal antenatal attachment. This is accordance with the literature.[9] Therefore, it may be concluded that pregnant women are able to sense the baby's new movements as it grows, which makes the experience more tangible for them and could help them engage with the fetus more effectively.

The current study findings were in the same line with descriptive study conducted in Egypt stated that the maternal antenatal attachment is high in mothers with the history of fetal loss.[1] This may be due to psychological and mental changes results from history of fetal or infant death.[12]

The findings of the present study, however, are in line with a prior investigation into the connection between prenatal stress and maternal-fetal attachment, which found that pregnant women who were nulliparous had higher levels of maternal-fetal attachment than those who were multiparous. This might be because pregnant women who are nulliparous are giving birth to their first children and are sensitively giving the fetuses extra love and care.[11]

Strengths and Limitations

The strengths of the study were that the research topic was novel and addressed the level of maternal antenatal attachment and its associated factors. The study utilizes a primary dataset. The validity of the instrument was ensured through expert review and pre-testing. The limitations of the study were that, since self-administered techniques were used, exaggeration or under reporting of responses might have occurred. There was also the possibility of recall bias, as the MAAS investigates perceptions of the past events (within 2 week).

Recommendations

The low level of maternal antenatal attachment was found among pregnant women; so, it is recommended to integrate attachment screening into routine antenatal care. This includes using assessment tool such as MAAS during routine ANC visits and training midwives and nurses to identify mothers at risk for low antenatal attachment.

Implication

Maternal attachment as an important component of maternal identity that promote healthy growth and development of the child. The findings of this study can contribute to the scientific body of knowledge and guide further research in different settings.

CONCLUSION

More than half pregnant women had low level of maternal antenatal attachment. According to the results, there is significant association between multiple factors like maternal education, occupation, trimester, abortion history and number of children with maternal antenatal attachment.

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Compliance of Iron Supplementation during Pregnancy among Pregnant Women Attending at Dhulikhel Hospital

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ABSTRACT

Background

Iron deficiency anemia is a common nutritional problem, highly prevalent in developing countries, and it can be prevented by iron supplementation. Therefore, compliance with iron supplementation plays a vital role in preventing iron deficiency anemia.

Objective

To determine the compliance of iron supplementation among pregnant women at Dhulikhel Hospital.

Method

A quantitative descriptive cross-sectional study was conducted among 307 pregnant women attending Dhulikhel Hospital. A structured and semi-structured questionnaire was used for data collection through interviews. Purposive sampling technique was used to select pregnant women. SPSS version 16 was applied for data analysis, using descriptive statistics (frequency and percentage) and inferential statistics (chi-square test).

Result

The study shows that 63.2% of pregnant women had a higher compliance with iron supplementation. The majority of pregnant women (92.55%) took iron supplementation at night, whereas very few pregnant women (3.3%) consumed a vitamin C-rich diet while taking iron supplements. There was a statistically significant association between age and occupation with compliance with iron supplementation, whereas there was no statistically significant association between educational level and gravida with compliance with iron supplementation. There was no positive correlation between perceived benefits and perceived barriers with compliance with iron supplementation.

Conclusion

The study revealed that nearly two-thirds of pregnant women had higher compliance with iron supplementation. Most pregnant women did not consume a vitamin C-rich diet while taking iron supplementation. The findings from this study highlight the need for health education regarding the intake of a vitamin C-rich diet while taking iron supplementation.

KEY WORDS

Compliance, Iron supplementation, Pregnancy, Pregnant women, Supplement adherence

INTRODUCTION

Iron is an essential nutrient required for hemoglobin synthesis, and its demand increases during pregnancy, notably during the second half.[1,2] This increased demand is fulfilled if the woman has previously stored iron in her body and through the amount of iron absorbed from the diet during pregnancy.[3] In developing countries, during such conditions, dietary iron intake in the majority of the population is not sufficient.[4,5] Among major global public health problems, iron deficiency anemia is one of them, and it is a leading cause of maternal mortality and morbidity worldwide. Iron deficiency anemia is a common nutritional problem affecting both developed and developing countries.[6] It is highly prevalent in less developed countries, where, in addition to poor nutrition, parasitic and bacterial infections can contribute to the depletion of iron reserves.[7] Worldwide, it is estimated that as many as 20% of maternal deaths are directly caused by anemia through its complications.[4,8] Iron deficiency anemia is one of the risk factors for miscarriage, stillbirth, prematurity, low birth weight, and impairment in children's development and learning.[9-11]

For developing countries, the WHO has recommended a daily intake of 60mg of iron and 0.4 mg of folic acid during pregnancy, which is the foremost action to prevent iron deficiency anemia.[12,13] In Nepal, the government has supplied the same dose of iron combined with folic acid in one tablet as per WHO recommendations, free of cost.[14]

Different studies have shown that iron deficiency anemia can be prevented by iron supplementation. Various studies conducted in Nepal related to compliance with iron supplementation have found compliance rates of 58% and 73.4% in the Eastern Terai of Nepal and in Kathmandu, respectively.[15,16] The study shows that those who had not complied with iron supplementation were 24 times more likely to be anemic.[15] The aim of this study is to determine the compliance of iron supplementation during pregnancy among pregnant women attending the outpatient department of the hospital.

METHODS

A quantitative approach with a descriptive cross sectional study was conducted from May 5 to June 1, 2019 in the antenatal care outpatient department of Dhulikhel Hospital, Kavre. The sample size was determined using the following formula: $n= (Z^2 \times pq) \div L^2$. n = required sample size; Z = desired confidence level (1.96 for 95%); p = estimated proportion (prevalence = 58%); q = 1 – p (1- 0.58 = 0.42); L = allowable margin of error (10% of p = 0.058). After considering a 10% non-response rate, the final sample size was 307.[15] Non probabilitypurposive sampling technique was used. Pregnant women who had taken iron supplementation at least one month prior to the date of study were included.

A structured and semi-structured questionnaire was used for data collection. The questionnaire was developed in English and then translated in Nepali. Part I consisted of a semi-structured questionnaire related to socio-demographic information of respondents. Part II comprised questions related to compliance with iron supplementation based on regularity, time and absorption process. It consisted of 4 questions on a rating scale with a maximum score 16, ranging from 0 - 16 where 0 denoted never and 4 denoted always on the rating scale. The data were not normally distributed so, a score equal or above the median was considered as higher compliance with iron,anda scorebelow the median was considered as lower compliance with iron. Part III consisted of likert scale related to perceived benefits and perceived barriers of iron supplementation. Questions related to perceived benefits of iron supplementation consisted of 6 items with a maximum score of 24, ranging from 6-24 (1 for strongly disagree and 4 for strongly agree), andquestions related to perceived barriers of iron supplementationconsisted of 6 itemswith a maximum score of 24, ranging from 0-24 (0 for always and 4 for never) on the rating scale. Content validity was ensured through extensive literature review and consulting experts in the field of nursing researchand related subjects. The data collection tool was pre-tested on 10% of the total sample which was 31 and not included in the main study. Data were collected through face to face interviews.

Ethical clearance was obtained from IRC-KUSMS prior to the study. Permission to collect data was obtained from each respondent prior to data collection. Privacy and confidentiality of the respondents were maintained, and they weren't forced to participate. Information of the respondents was used only for the research purposes. SPSS version 16 was used for data analysis. Descriptive statistics such as percentage and frequency were used to determine compliance with iron supplementation, and inferential statistics such as chisquare test were used to find associations between selected variables.

RESULTS

Out of 307 pregnant women, slightly more than half (51.1%) were between age group 16-25 years, with a mean age of 25.55 years and a standard deviation of ± 4.482. The majority of pregnant women (94.5%) were literate. More than half (58.3%) had secondary level of education. Two third (66.4%) were homemaker, and a few (5.8%) were engaged in other occupations such astailoring and teaching. Slightly more than half (51.1%) were primigravida and only 1% were grand multigravida (Table 1).

Compliance of iron supplementation

Among the total 307 pregnant women, nearly two third (63.2%) had higher compliance with iron supplementation, and more than one third (36.8%) had lower compliance with iron supplementation (Table 2).

Table 1. Socio-demographic information of respondents (n=307)

Characteristics	Frequency	Percentage (%)
Age group		
16-25 years	157	51.1
26-35 years	143	46.6
More than 35 years	7	2.3
Education Status		
Illiterate	17	5.5
Literate	290	94.5
Education Level (n=290)		
Primary level	44	15.1
Secondary level	169	58.3
Higher Secondary level	77	26.6
Occupation		
Homemaker	204	66.4
Agriculture	21	6.8
Services	32	10.4
Business	32	10.4
Others	18	5.8
Gravida		
Primigravida	157	51.1
Multigravida	147	47.9
Grand multigravida	3	1.0

Table 2. Compliance with iron supplementation (n= 307)

Characteristics	Frequency	Percentage (%)
Lower compliance of iron (< median)	113	36.8
Higher compliance of iron (≥ median)	194	63.2

Correlation between compliance of iron supplementation withperceivedbenefits and barriers of iron supplementation

There is no positive correlation between perceived benefits and barriers to compliance with iron supplementation, as the p value is not statistically significant (Table 3).

Association of compliance of iron supplementation and demographic variables

Pregnant women in the age group ≥ 25 years were more compliant (42.2%) than those in the age group < 25 (29.9%). This difference is statistically significant with a p value is 0.032, indicating a significant association between compliance with iron supplementation and the age of pregnant women. Additionally, there is a significant association between compliance with iron supplementation and occupation of pregnant women, with a p value of 0.013. However, there is a significant association between compliance with iron supplementation and educational level, occupation andgravidaof pregnant women as the p value is more than 0.05 (Table 4).

Table 3. Correlation between compliance with iron supplementation and perceived benefits, perceived barriers of iron supplementation (n= 307)

	Median Score	Interquartile range	Spearman correlation Coefficient (r)	p value
Perceived benefits of iron supplementation	22	23-20	0.064	0.264
Compliance with iron supplementation	12	12-10		
Perceived Barrier of iron supplementation	22	24-20	0.068	0.237
Compliance with iron supplementation	12	12-10		

Table 4. Association of compliance with iron supplementation and demographic variables (n=307)

Characteristics	Higher compliance with iron supplementation f(%)	Lower compliance with iron supplementation f(%)	p value
Age group			
< 25 years	40 (29.9)	94 (70.1)	0.032
≥ 25 years	73 (42.2)	100 (57.8)	
Educational level			
Primary level	13(29.5)	31(70.5)	
Secondary level	64(37.9)	105(62.1)	0.434
Higher Secondary level	32(41.6)	45(58.4)	
Occupation			
Homemaker	139(68.1)	65(31.9)	0.013
Others	55(53.4)	48(46.6)	
Gravida			
Primigravida	62(39.5)	95(60.5)	0.345
Multigravida	51(34.0)	99(66.0)	

DISCUSSION

The present study found that two third of pregnant women (63.2%) had higher compliance with iron supplementation. However, this result is lower than the findings of a cross sectional study conducted in Kathmandu, Nepal in which 73.2% had higher compliance.[16] The attributable reasons might include difference in the tool used, study population and the duration of assessing compliance.

The present study shows that more than three fourth pregnant women (79.5%) took iron supplements regularly every day. This finding is higher than the study conducted in Indonesia, where more than half of pregnant women (57.8%) intake iron supplements daily.[17] The possible justification might be difference in educational level, aseducated women can better understand the benefits of iron and increase compliance to iron supplementation.

The present study shows that the majority of pregnant women (92.5%) take iron supplements at night. This is higher than the study finding conducted in Indonesia, where more than one third of pregnant women (37.3%) take iron supplements at night.[17]

In this study, nearly three fourth (71.3%) of pregnant women do not take iron supplements close to drinking tea or milk. The result of this study is higher than the study undertaken in Indonesia, in which less than half of pregnant women (43.1%) ideally do not take iron supplements close to drinking tea or milk.[17] This difference might be due to the majority of pregnant women taking iron supplements prior to sleep.

Only a few pregnant women (3.3%) take a vitamin C rich diet while taking iron supplements. The finding of this study is lower than the study conducted in Indonesia, where 66.7% pregnant women take a vitamin C rich diet while taking iron supplements.[17] This difference might be due to a lack of knowledge and understanding about the importance of intake of a vitamin C rich diet while taking iron supplements.

The study reveals that there is no positive correlation between perceived benefits and perceived barriers with compliance with iron supplementation, as the p values are 0.264 and 0.237 respectively. In contrast, with the study conducted in Indonesia, perceived benefits and perceived barriers were correlated with compliance with iron supplementation (p value 0.001 and 0.003 respectively).[17]

In this study, there was a significant association found between age and compliance with iron supplements (p value 0.032), which is similar to the study conducted in urban area of South India (p value 0.031)and study done in Western Amhara ($p < 0.05$).[8,18] In contrast, there was no significant association found between age and compliance with iron supplementation (p value 0.952) in the study conducted in Pokhara, Nepal.[19]

In this study, there was no significant association between educational level and compliance with iron supplementation (p value 0.434), which is similar to the study done in Kathmandu ($p > 0.05$).[16] In contrast to this finding, a study conducted in Southeastern Nigeria (p value 0.001) showsa significant association between educational level and compliance with iron supplementation.[20]

In this study, there was a significant association found between occupation and compliance with iron supplementation (p value 0.013), which is similar to the study conducted in the Eastern Terai of Nepal (p value 0.013).[15]

In this study, there was no significant association found between gravida and compliance with iron supplementation (p value 0.345), whereas it is similar to the study done in Eastern Terai of Nepal (p value 0.132).[15] The probable reason might be that most pregnant women were literate and have better exposure to information and concern towards health. However, this finding contrasts with the study finding conducted in Kiambu, Kenya (p value 0.011).[21]

CONCLUSION

Nearly two-thirds of pregnant women had higher compliance with iron supplementation. There was no correlation between perceived benefits and perceived barriers with compliance with iron supplementation. There was a statistically significant association between the age and occupation of pregnant women with compliance with iron supplementation. However, there was no statistically significant association between educational level, occupation, and gravida of pregnant women with compliance with iron supplementation. Health education regarding compliance should be provided regularly to pregnant women during antenatal visits, along with information on the intake of a vitamin C-rich diet while taking iron supplementation.

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