



Knowledge of the Safe Delivery App Among Staff Nurses at Selected Hospitals, Perinthalmanna: A Descriptive Study

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ABSTRACT

Background: Maternal and newborn mortality remain critical public health challenges, particularly in low-resource settings. The Safe Delivery App (SDA), developed by the Maternity Foundation in collaboration with the University of Copenhagen, provides evidence-based clinical protocols and instructional videos for obstetric and neonatal emergencies. The app is accessible offline and aligns with WHO intrapartum care guidelines; however, knowledge and utilisation among nursing staff remain inadequately evaluated. **Objective:** To assess the level of knowledge regarding the Safe Delivery App among staff nurses at selected hospitals in Perinthalmanna and to identify demographic variables significantly associated with knowledge levels. **Methods:** A quantitative, non-experimental, descriptive survey design was adopted. One hundred ($n = 100$) staff nurses were recruited by purposive sampling from selected hospitals in Perinthalmanna. Data were collected using a validated structured knowledge questionnaire of 20 items. Content validity was established by expert review; reliability was assessed using Spearman's method ($r = 0.95$). Descriptive statistics and the chi-square test were used for data analysis. **Results:** The majority of participants (56%) demonstrated poor knowledge, 33% moderate knowledge, and 11% adequate knowledge of the SDA. A statistically significant association was found between prior exposure to the SDA and knowledge level ($\chi^2 = 29.22$, $df = 2$, table value = 5.991, $p < 0.05$). No significant associations were observed with age, educational qualification, years of experience, or department of work. **Conclusion:** Staff nurses demonstrated predominantly poor to moderate knowledge of the Safe Delivery App. Targeted educational interventions and an informational pamphlet are recommended to bridge the knowledge gap and promote evidence-based utilisation of the SDA in clinical practice.

Keywords: safe delivery app; staff nurses; knowledge assessment; maternal health; descriptive study; informational pamphlet

INTRODUCTION

Maternal and newborn mortality remain significant public health challenges, disproportionately affecting low- and middle-income countries. Preventable deaths attributable to suboptimal management of obstetric and neonatal emergencies including postpartum haemorrhage, eclampsia, and neonatal asphyxia continue to represent a major burden in resource-limited settings [1]. Equipping nursing staff with current, evidence-based clinical protocols is therefore a recognised priority in global maternal health policy.

The Safe Delivery App (SDA), developed by the Maternity Foundation in partnership with the University of Copenhagen and international collaborators, is a digital clinical decision-support tool designed to address this gap [2]. It delivers animated instructional videos and step-by-step protocols covering active management of the third stage of labour, manual removal of the placenta, newborn resuscitation, pre-eclampsia and eclampsia management, and postpartum haemorrhage management. The app functions offline, is compatible with standard smartphones, and aligns with WHO recommendations for intrapartum care [3]. A cluster-randomised trial conducted in Ethiopia demonstrated that access to the SDA was associated with

significant improvements in healthcare worker knowledge, clinical skills, and perinatal survival outcomes [4].

Despite its established efficacy in sub-Saharan African settings, the extent of awareness and knowledge of the SDA among staff nurses in Indian hospital settings remains poorly characterised. Nurses, as frontline providers of intrapartum and neonatal care, are ideally positioned to benefit from and champion the adoption of evidence-based mobile health tools. This study was therefore conducted to assess the knowledge of the SDA among staff nurses at selected hospitals in Perinthalmanna, Kerala, and to identify demographic correlates of knowledge levels, as a prerequisite to developing targeted educational interventions.

Objectives: The specific objectives of this study were: 1. To assess the level of knowledge regarding the Safe Delivery App among staff nurses at selected hospitals, Perinthalmanna. 2. To identify associations between knowledge levels and selected demographic variables (age, educational qualification, years of experience, department of work, and prior exposure to the SDA). 3. To develop an informational pamphlet on the Safe Delivery App to bridge the identified knowledge gap.

MATERIALS AND METHODS

Research Design

A quantitative, non-experimental, descriptive survey design was adopted for this study. This design was selected as appropriate for describing the knowledge levels and associated demographic variables of a defined population without experimental manipulation [5].

Study Setting

The study was conducted at selected hospitals in Perinthalmanna, Malappuram district, Kerala, India. Data collection was carried out following institutional approval from the concerned authorities.

Study Population and Sample

The target population comprised staff nurses employed at selected hospitals in Perinthalmanna. A sample of 100 staff nurses was recruited using purposive (non-probability) sampling. All consenting staff nurses on duty during the data collection period who met the inclusion criteria were included in the study.

Data Collection Tool

Data were collected using a researcher-developed, structured knowledge questionnaire consisting of two parts. Part A comprised a demographic data sheet collecting information on age, educational qualification, years of experience, department of work, and prior exposure to the SDA. Part B comprised 20 closed-ended items assessing knowledge of the SDA, including its features, content modules, and clinical applications. Each correct response was scored 1 and incorrect responses scored 0, yielding a total possible score of 0–20.

Knowledge scores were categorized as follows: Score 0–6: Poor knowledge. Score 7–13: Moderate knowledge. Score 14–20: Adequate knowledge

Validity and Reliability

Content validity of the questionnaire was established by submitting it to a panel of subject experts and incorporating their

feedback. Face validity was also assessed. The reliability of the tool was determined by a pilot study using the test–retest method; Spearman’s rank correlation coefficient yielded $r = 0.95$, indicating high reliability.

Data Collection Procedure

After obtaining institutional and ethical approval, formal written permission was obtained from the hospital authorities. Informed written consent was obtained from each participant before data collection. Participants were briefed on the purpose of the study and assured of confidentiality. The questionnaire was administered individually; participants were allowed adequate time to complete it.

Statistical Analysis

Data were entered and analysed using standard statistical software. Descriptive statistics (frequencies, percentages) were used to summarise demographic characteristics and knowledge levels. The chi-square test of independence ($\alpha = 0.05$) was used to assess associations between knowledge level and each demographic variable. A p-value of < 0.05 was considered statistically significant; the chi-square critical value at $df = 2$, $\alpha = 0.05$ is 5.991.

RESULTS

Demographic Profile of Study Participants

Table 1 presents the demographic characteristics of the 100 study participants. The majority were aged 20–25 years (54%), followed by 26–30 years (31%). Regarding educational qualification, 67% held a General Nursing and Midwifery (GNM) diploma, 22% held a BSc Nursing degree, and 11% held an ANM qualification; none held a postgraduate (MSc Nursing) qualification. Nearly half of the participants (46%) had 1–3 years of work experience, while 30% had less than one year of experience. The majority were posted in the general ward (49%), followed by the labour room (25%). A minority (23%) reported prior exposure to the Safe Delivery App, while 77% had no prior exposure.

Table 1. Demographic Characteristics of Study Participants (n = 100)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–25	54	54.0
	26–30	31	31.0
	31–35	7	7.0
	>35	8	8.0
Educational Qualification	ANM	11	11.0
	GNM	67	67.0
	BSc Nursing	22	22.0
	MSc Nursing	0	0.0
Years of Experience	<1 year	30	30.0
	1–3 years	46	46.0
	4–6 years	21	21.0
	>6 years	3	3.0
Department	General ward	49	49.0
	Labour room	25	25.0
	ICU	6	6.0
	Others	20	20.0
Prior Exposure to SDA	Yes	23	23.0

SDA = Safe Delivery App; ANM = Auxiliary Nurse Midwife; GNM = General Nursing and Midwifery; ICU = Intensive Care Unit.

Knowledge Levels Regarding the Safe Delivery App

The distribution of participants by level of knowledge is illustrated in Figure 1. The majority of staff nurses (56%) demonstrated poor knowledge (score 0–6), 33% demonstrated

moderate knowledge (score 7–13), and only 11% demonstrated adequate knowledge (score 14–20) of the Safe Delivery App. These findings indicate that the overall level of knowledge of the SDA among staff nurses is predominantly poor to moderate.

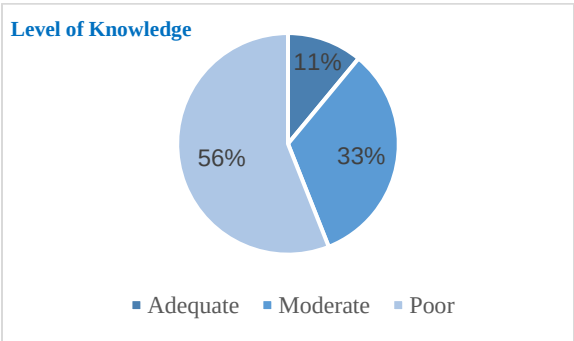


Figure 1. Distribution of participants according to level of knowledge of the Safe Delivery App (n = 100).

Association Between Prior Exposure to the SDA and Knowledge Level

Chi-square analysis was performed to test the association between each demographic variable and knowledge level. Table 2 presents the results for prior exposure to the SDA, the only variable that showed a statistically significant association. Of participants who reported prior exposure (n = 23), 14

demonstrated moderate knowledge and 7 demonstrated adequate knowledge; by contrast, of those with no prior exposure (n = 77), 54 demonstrated poor knowledge. The obtained chi-square value ($\chi^2 = 29.22$) exceeded the critical table value (5.991) at df = 2 and $\alpha = 0.05$, confirming a statistically significant association ($p < 0.05$). No significant associations were observed between knowledge level and age, educational qualification, years of experience, or department of work.

Table 2. Association Between Prior Exposure to the Safe Delivery App and Knowledge Level ($\alpha = 0.05$)

	Poor (n)	Moderate (n)	Adequate (n)	χ^2	df	Table Value	Significance
Yes (n = 23)	2	14	7	29.22	2	5.991	p < 0.05
No (n = 77)	54	19	4				

DISCUSSION

The present study found that the majority of staff nurses (56%) demonstrated poor knowledge, 33% moderate knowledge, and only 11% adequate knowledge of the Safe Delivery App. These findings are consistent with the broader evidence that awareness and utilisation of evidence-based mobile health tools remain limited among nursing staff in resource-constrained settings, particularly in the absence of structured orientation or training programmes.

Similar findings have been reported in studies examining the impact of the SDA in the Ethiopian healthcare context, where healthcare workers demonstrated low baseline knowledge before structured SDA training interventions, with significant improvements observed following app-based learning [6]. Studies of mobile health intervention effectiveness in Indian nursing contexts have similarly highlighted gaps in awareness and knowledge of digital clinical tools, underscoring the need for institution-level integration of app-based learning into nursing education and in-service training [7]

The significant association between prior exposure to the SDA and knowledge level ($p < 0.05$) is an expected finding and

supports the premise that even informal prior contact with the app is associated with higher knowledge scores. Notably, of the 23 participants who had prior exposure, 14 had moderate knowledge and 7 had adequate knowledge, whereas 54 of the 77 participants without prior exposure fell in the poor knowledge category. This pattern strongly suggests that targeted, structured educational interventions utilising the SDA have the potential to meaningfully shift the knowledge distribution in this population.

The absence of significant associations between knowledge level and age, educational qualification, years of experience, or department of work indicates that knowledge gaps are not limited to any particular subgroup and are pervasive across the nursing workforce. This highlights the need for universal, institution-wide educational interventions rather than targeting specific demographic groups.

STRENGTHS AND LIMITATIONS

Strengths

This study provides original primary data on the knowledge of the Safe Delivery App among nursing staff in a defined Indian hospital setting. The use of a validated, reliable questionnaire

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(Spearman $r = 0.95$), expert-verified content validity, and a reasonable sample size ($n = 100$) constitute methodological strengths. The development of an evidence-based informational pamphlet as an intervention output adds practical value to the study findings.

Limitations

The study is subject to several limitations. Purposive sampling limits the generalisability of findings to the broader nursing population in Kerala or India. The cross-sectional design precludes assessment of changes in knowledge over time. Self-reported questionnaire responses may be subject to response bias. The original analysis of associations with multiple demographic variables without correction for multiple comparisons should be interpreted with caution. Replication in larger, probability-sampled cohorts across diverse hospital settings is recommended.

CONCLUSION

Staff nurses at selected hospitals in Perinthalmanna demonstrated predominantly poor to moderate knowledge of the Safe Delivery App. Prior exposure to the SDA was the only

demographic variable significantly associated with higher knowledge levels. These findings highlight a substantial knowledge gap that is distributed across all demographic subgroups. Structured educational interventions, integration of the SDA into in-service nursing training, and institutional support for digital health tool adoption are recommended. An informational pamphlet was developed as an immediate, low-cost intervention to improve awareness and knowledge of the SDA among clinical nursing staff.

DECLARATIONS

Conflict of Interest: The authors declare no conflict of interest.

Funding: This study received no external funding.

Ethical Approval: Ethical approval was obtained from the institutional ethics committee prior to data collection.

Informed Consent: Written informed consent was obtained from all study participants.

Data Availability: Data supporting the findings of this study are available from the corresponding author upon reasonable request.

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