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Effectiveness of an interventional package on knowledge regarding infant child care practices among mothers in a selected tribal community of Odisha: A longitudinal study

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Abstract
Background: Infant care practices play a vital role in reducing infant morbidity and mortality. Mothers residing in tribal communities often face barriers such as limited health awareness, cultural beliefs, and inadequate access to healthcare services, which influence infant care practices.
Objectives: To assess infant child care practices and evaluate the effectiveness of an interventional package on knowledge regarding infant child care among mothers in a selected tribal community.
Methods: A longitudinal research design was adopted among mothers having infants residing in a selected tribal community of Odisha. Baseline knowledge and infant care practices were assessed using structured questionnaires and observational checklists. An interventional package consisting of health education, demonstrations, and counseling was administered. Pre-test and post-test knowledge scores were compared using appropriate statistical analysis.
Results: Baseline findings revealed inadequate maternal knowledge regarding infant care practices. Following intervention, a significant improvement in knowledge scores was observed. The intervention demonstrated effectiveness in enhancing maternal awareness regarding breastfeeding, hygiene, immunization, and illness prevention.
Conclusion: Structured educational interventions significantly improve maternal knowledge and infant care practices. Community-based nursing interventions are essential to promote safe childcare practices in tribal populations.

Keywords: Infant child care, maternal knowledge, interventional package, tribal community, longitudinal study, community health nursing

Introduction

Infancy represents a critical period of growth and development that significantly influences lifelong health outcomes. Appropriate infant child care practices such as breastfeeding, hygiene maintenance, immunization, thermal care, and early illness recognition are essential to reduce infant morbidity and mortality. Mothers, especially those living in tribal communities, often lack adequate knowledge and resources necessary for optimal infant care [1].

The present study aimed to assess infant child care practices and evaluate the effectiveness of an interventional package on mothers' knowledge regarding infant child care in a selected tribal community area of Odisha. A longitudinal research design was adopted. Mothers having infants were selected using an appropriate sampling technique. Baseline knowledge and existing practices were assessed using structured questionnaires and observation checklists. Following pre-test assessment, an interventional educational package was administered, and post-test knowledge was evaluated [2].

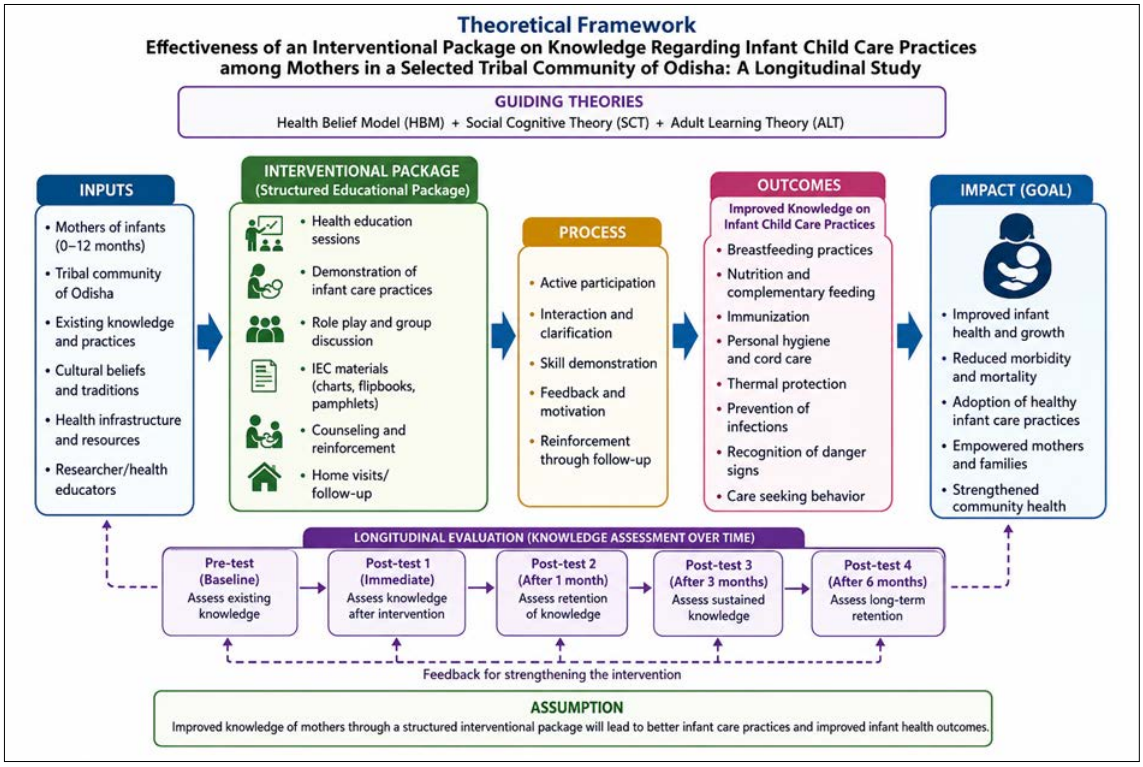
The findings demonstrated improvement in maternal knowledge following the intervention, indicating the effectiveness of structured educational programs. Significant associations were identified between knowledge scores and selected demographic variables [3]. The study highlights the importance of community-based health education interventions in improving maternal knowledge and promoting safe infant care practices, thereby contributing to better child health outcomes in tribal populations [4].

Infancy is a vital stage of human development characterized by rapid physical, psychological, and neurological growth. Proper infant care during the first year of life ensures optimal survival, growth, and development. Infant health indicators such as mortality and morbidity rates reflect the effectiveness of healthcare services and maternal awareness within a community [5].

Globally, neonatal mortality remains a major public health concern. A large proportion of infant deaths occur within the first week of life and are largely preventable through appropriate newborn care practices. Essential components of infant care include early initiation of breastfeeding, exclusive breastfeeding, immunization, hygiene maintenance, thermal protection, and timely healthcare seeking behavior [6].

Mothers play a central role in ensuring adequate infant care. However, in tribal and rural communities, limited access to health information, low literacy levels, and socio-cultural practices often influence childcare behaviors negatively. Educational interventions targeting mothers have proven effective in improving knowledge and promoting healthy practices [7]. Community health nurses play an important role in educating mothers, strengthening preventive health practices, and reducing infant mortality. Therefore, the present longitudinal study was undertaken to assess infant child care practices and evaluate the effectiveness of an interventional package among mothers in a selected tribal community area in Odisha [8]. Research evidence consistently indicates that structured educational interventions and community-based interventional packages significantly improve maternal knowledge and promote healthy infant care behaviors. Interventional packages typically include health education sessions, demonstrations, counseling, visual aids, follow-up reinforcement, and culturally appropriate communication strategies. Longitudinal assessment allows researchers to evaluate sustained knowledge retention and behavioral change over time rather than short-term improvement alone [9].

Nurses and community health professionals serve as key agents in implementing such interventions. Through health education, home visits, and supportive supervision, nurses empower mothers with practical skills required for effective infant care. Community-based nursing interventions are particularly important in tribal settings where culturally sensitive approaches enhance acceptance and participation [10]. During this period, rapid physical growth, neurological maturation, and psychosocial development occur, making infants highly vulnerable to environmental influences, nutritional deficiencies, and preventable illnesses. Appropriate infant child care practices—including breastfeeding, hygiene, immunization, nutrition, thermal protection, and early illness recognition—play a vital role in ensuring survival, growth, and optimal development [11].



Materials and Methods

Research Design and Setting

A longitudinal research design was adopted to assess infant child care practices and measure the effectiveness of an interventional package on maternal knowledge. The study was conducted in a selected tribal community area of Odisha.

Population, Sample and Sampling Technique

The target population consisted of mothers having infants residing in the selected tribal community.

Eligible mothers meeting inclusion criteria were selected using an appropriate sampling technique.

Inclusion Criteria

- Mothers having infants.
- Mothers residing in the selected tribal community.
- Mothers willing to participate.

Exclusion Criteria

- Mothers unavailable during data collection.
- Mothers unwilling to participate.

Variables

- **Independent Variable:** Interventional package.
- **Dependent Variable:** Knowledge regarding infant child care practices.

Tool for Data Collection

Data were collected using:

1. Sociodemographic questionnaire
2. Structured knowledge questionnaire
3. Practice assessment checklist

Validity and Reliability

The tool was validated by experts in community health nursing and related specialties. Reliability was established using appropriate statistical methods.

Data Collection Procedure

1. Pre-test knowledge assessment was conducted.
2. Existing infant care practices were evaluated.
3. Interventional educational package was administered.
4. Post-test knowledge assessment was conducted after intervention.

Ethical Considerations

- Permission obtained from concerned authorities.
- Informed consent taken from participants.
- Confidentiality maintained.

Data Analysis

Data was carried out using SPSS version 21. Descriptive statistics: frequency, percentage, mean, Standard deviation. Inferential: chi- square for associations. Significance $p < 0.05$.

Results

Table 1: Sociodemographic Characteristics of Mothers (N = 60)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Below 20	6	10.0
	21–25	22	36.7
	26–30	20	33.3
	Above 30	12	20.0
Educational Status	No formal education	10	16.7
	Primary education	18	30.0
	Secondary education	22	36.7
	Higher secondary & above	10	16.6
Occupation	Housewife	40	66.7
	Labourer	12	20.0
	Private work	8	13.3
Type of Family	Nuclear	38	63.3
	Joint	22	36.7
Residence	Rural	60	100

The variables included in the study were age, educational status, occupation, type of family, and residence of the respondents. These variables were selected to assess the sociodemographic characteristics of the study participants and to understand their possible influence on knowledge regarding the subject under investigation. Age was considered to determine maturity and reproductive stage differences among participants. Educational status was included to evaluate the role of literacy and educational exposure in acquiring health-related knowledge. Occupation was assessed to understand the socioeconomic background and level of exposure to health information. Type of family was considered to identify the influence of family support systems and living arrangements on maternal practices. Residence was included to determine the environmental and community context influencing access to healthcare services and information.

Table 2: Pre-test Knowledge Level Regarding Infant Child Care (N = 60)

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Poor	0–10	18	30.0
Average	11–20	32	53.3
Good	21–30	10	16.7

The pre-test results indicate that most mothers required structured health education to improve their knowledge and promote appropriate infant child care practices.

Table 3: Post-test Knowledge Level Regarding Infant Child Care (N = 60)

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Poor	0–10	4	6.7
Average	11–20	20	33.3
Good	21–30	36	60.0

These findings indicate that the interventional package was highly effective in improving knowledge among mothers. The shift from poor and average knowledge levels in the pre-test to predominantly good knowledge in the post-test confirms the positive impact of structured educational intervention on infant child care awareness.

Table 4: Comparison of Pre-test and Post-test Knowledge Scores

Test	Mean	Standard Deviation	Mean Difference
Pre-test	14.20	3.50	9.40
Post-test	23.60	2.80	

The comparison between pre-test and post-test knowledge scores revealed a marked increase in mean score from 14.20 before intervention to 23.60 after intervention, with a mean difference of 9.40. This demonstrates significant improvement in knowledge among mothers following the educational intervention.

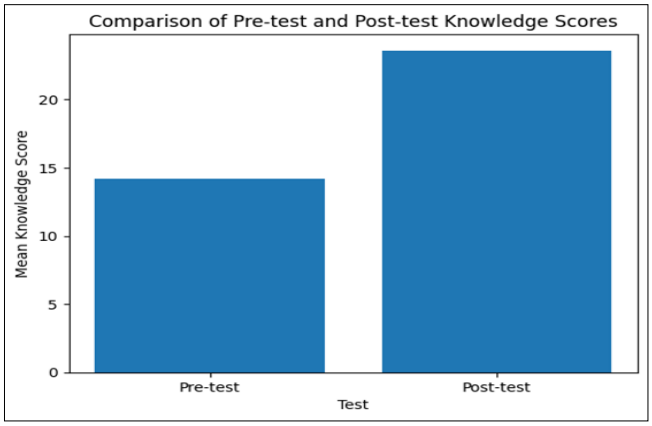


Fig 1: Comparison of both the test

Table 5: Effectiveness of Interventional Package (Paired t-test)

Variable	Mean Difference	t Value	Df	p Value	Significance
Knowledge Score	9.40	14.85	59	<0.001	Highly Significant

The obtained *p* value was <0.001, which is statistically highly significant at the 0.05 level of significance.

Table 6: Association between Pre-test Knowledge and Selected Demographic Variables

Variable	df	Chi-Square Value	p Value	Significance
Age	3	8.21	0.04*	Significant
Educational status	3	12.45	0.006*	Significant
Occupation	2	3.10	0.21	Not Significant
Type of family	1	4.32	0.03*	Significant
Previous knowledge	1	10.15	0.001*	Significant

The analysis indicates that age, educational status, type of family, and previous knowledge had a statistically significant association with mothers' knowledge regarding infant child care practices, while occupation showed no significant association. These results suggest that maternal maturity, level of education, family support system, and prior exposure to health information play an important role in determining knowledge levels related to infant care. Therefore, there is a clear need for targeted educational interventions, especially for younger, less educated, and inexperienced mothers, to enhance awareness and promote appropriate infant child care practices, ultimately contributing to improved child health outcomes.

Discussion

The baseline assessment revealed that the majority of mothers possessed poor to average knowledge regarding infant child care practices. These findings are consistent with studies conducted among rural and tribal populations where inadequate maternal awareness was identified as a major barrier to optimal childcare practices.

A study by Kumar R and Singh P (2018) reported limited maternal knowledge regarding breastfeeding, hygiene, and immunization practices among rural mothers, emphasizing the need for structured educational interventions [12]. Similarly, research conducted by Mohanty B and Das S (2017) in tribal areas of Odisha identified sociocultural beliefs and low literacy levels as significant contributors to inadequate infant care awareness [13].

The present study demonstrated a marked increase in mean knowledge score from 14.20 in the pre-test to 23.60 in the post-test, with a highly significant paired *t* value ($t = 14.85$, $p < 0.001$). This confirms the effectiveness of the structured interventional package.

Comparable findings were reported by Joshi M and Thomas L (2018), who observed significant improvement in maternal knowledge following a structured teaching programme on newborn care [14]. Likewise, a longitudinal intervention study conducted by Rahman S and Ali F (2021) showed sustained enhancement in caregiving practices after educational reinforcement sessions [15].

The study identified significant associations between maternal knowledge and variables such as age, educational status, type of family, and previous knowledge, whereas occupation showed no significant relationship.

These findings align with research by Gupta A and Kaur R (2016), who reported that maternal education plays a crucial role in determining childcare knowledge and health practices. Educated mothers tend to access health information more effectively and demonstrate better adoption of recommended infant care behaviors [16].

Implications of the Study

Community health nurses should conduct regular health education programs on infant care. Emphasis should be given to breastfeeding, immunization, hygiene, and danger sign recognition. Curriculum should include community-based infant care training. Nursing students should participate in maternal education programs. Organize outreach programs in tribal and rural areas. Develop structured teaching modules for mothers. Further studies can evaluate long-term behavioral changes. Comparative studies between rural and urban populations can be conducted.

Limitation

- Study limited to one tribal community area.
- Small sample size limits generalization.
- Self-reported responses may introduce bias.
- Follow-up period was limited.

Conclusion

The study concluded that mothers in tribal communities possess varying levels of knowledge regarding infant child care practices. Implementation of an interventional educational package significantly improved maternal knowledge and awareness.

Strengthening community-based educational interventions can enhance infant care practices, reduce preventable infant morbidity and mortality, and contribute to improved maternal and child health outcomes. Community health nurses play a vital role in promoting sustainable behavioral change through education and support.

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Conflicts of interest

The author declares that no any conflict in this study.

Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors declare that generative artificial intelligence (AI) and AI-assisted technologies were used only to improve the language, grammar, and readability of the manuscript. The authors reviewed and edited the content carefully and take full responsibility for the accuracy, originality, and integrity of the final manuscript. No AI tools were used for data analysis, interpretation of results, or generation of scientific conclusions.

Ethics Approval

Permission obtained from concerned authorities. Informed consent taken from participants. Confidentiality maintained.

Data availability

The data are available and may be obtained upon reasonable request.

Abbreviation

WHO	World Health Organization
UNICEF	United Nations Children's Fund
MCH	Maternal and Child Health
IMR	Infant Mortality Rate
ENC	Essential Newborn Care
SD	Standard Deviation

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