



PILOT STUDY TO ASSESS THE EFFECTIVENESS OF A CARE BUNDLE ON KNOWLEDGE, PRACTICES, AMNIOTIC FLUID INDEX AND MATERNAL PARAMETERS AMONG MOTHERS WITH OLIGOHYDRAMNIOS AT SELECTED SETTING AT VILLUPURAM DISTRICT: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Background Oligohydramnios is a common obstetric complication characterized by decreased amniotic fluid volume and is associated with adverse maternal and neonatal outcomes. Early identification and implementation of evidence-based nursing interventions may improve maternal knowledge, self-care practices, and fetal well-being. **Aim** To evaluate the effectiveness of a structured care bundle intervention in improving knowledge, self-care practices, amniotic fluid index (AFI), and selected maternal parameters among mothers with oligohydramnios. **Materials and Methods** A quantitative quasi-experimental pre-test post-test control group design was adopted in selected medical colleges and hospitals of Villupuram, Tamil Nadu. Twenty-two antenatal mothers diagnosed with oligohydramnios were selected using non-probability purposive sampling. Eleven mothers were assigned to the study group and eleven to the control group. Baseline assessment included demographic variables, obstetric variables, knowledge, practice, AFI, and maternal parameters (maternal weight gain, fundal height, abdominal girth, fetal heart rate, and fetal movements). The study group received a structured nursing care bundle consisting of health education, hydration advice, nutritional counselling, fetal movement monitoring, antenatal counselling, and individualized nursing support, whereas the control group received routine antenatal care. Knowledge and practice were reassessed on the seventh day, while AFI and maternal parameters were evaluated at the fourth and eighth weeks. Data were analyzed using descriptive and inferential statistics. **Results** The intervention significantly improved maternal knowledge ($t=10.31, p<0.001$), self-care practices ($t=15.09, p<0.001$), and Amniotic Fluid Index at both four weeks ($t=2.70, p<0.01$) and eight weeks ($t=4.92, p=0.001$). Significant improvements were observed in fundal height, abdominal girth, fetal movements, and fetal heart rate during follow-up assessments, whereas maternal weight gain did not show statistically significant improvement. Positive correlations were observed among knowledge, practice, AFI, and maternal parameters. **Conclusion** The structured nursing care bundle was effective in improving maternal knowledge, self-care practices, amniotic fluid index, and selected maternal parameters among mothers with oligohydramnios. Incorporating such care bundles into routine antenatal nursing practice may enhance maternal and fetal outcomes.

KEYWORDS : Oligohydramnios, Care Bundle, Nursing Intervention, Amniotic Fluid Index, Maternal Parameters, Practice.

INTRODUCTION

Pregnancy is a dynamic physiological process involving anatomical, hormonal, metabolic, and psychological adaptations that support fetal growth and development. Adequate amniotic fluid is essential for fetal movement, pulmonary maturation, musculoskeletal development, thermoregulation, and protection against umbilical cord compression. Oligohydramnios, defined as a reduction in amniotic fluid volume below the expected level for gestational age, remains one of the most common obstetric complications encountered during pregnancy. It is associated with fetal distress, intrauterine growth restriction, meconium aspiration syndrome, operative delivery, low birth weight, preterm birth, prolonged hospitalization, and neonatal intensive care admission.

Although medical management of oligohydramnios has advanced considerably, structured nursing interventions focusing on maternal education, hydration, nutritional counselling, fetal movement monitoring, and self-care practices remain underutilized. A comprehensive care bundle may improve maternal knowledge and promote better pregnancy outcomes. Therefore, this study evaluated the effectiveness of a structured nursing care bundle among mothers diagnosed with oligohydramnios.

OBJECTIVES

1. To assess and compare the pre-test and post-test levels of knowledge, self-care practices, amniotic fluid index, and maternal parameters between the study and control groups.
2. To evaluate the effectiveness of the structured care bundle intervention.
3. To determine the correlation among knowledge, practice, AFI, and maternal parameters.
4. To identify the association between selected background variables and outcome variables in the study group.

RESEARCH HYPOTHESES

RH₁- There is a significant difference in pre and post-test knowledge, practice, amniotic fluid index and maternal parameters among mothers with oligohydramnios in the study and control group.

RH₂- There is a significant correlation between the mean differed score of knowledge, practice, amniotic fluid index and maternal parameters among mothers with oligohydramnios in the study and control group.

RH₃- There is a significant association of selected background variables with the mean differed score of knowledge, practice, amniotic fluid index and maternal parameters among mothers with oligohydramnios in the study group

MATERIALS AND METHODS

A quantitative quasi-experimental pre-test post-test control group design was employed. The study was conducted at ES hospital, Villupuram, Tamil Nadu.

Twenty-two antenatal mothers diagnosed with oligohydramnios were recruited through purposive sampling and allocated equally into study ($n=11$) and control ($n=11$) groups.

Baseline assessment included:

- Demographic characteristics
- Obstetric variables
- Knowledge questionnaire
- Practice checklist
- Amniotic Fluid Index (Ultrasonography)
- Maternal parameters

The study group received a structured care bundle comprising:

- Health education
- Nutritional counselling
- Hydration therapy guidance
- Daily fetal movement monitoring
- Antenatal counselling
- Individualized nursing support

The control group received routine antenatal care.

Knowledge and practices were reassessed on Day 7. AFI and maternal parameters were reassessed at four and eight weeks.

Statistical analysis included descriptive statistics, Chi-square test, Extended McNemar test, paired and independent t-test, Repeated Measures ANOVA (Greenhouse-Geisser correction), Karl Pearson correlation coefficient, and One-way ANOVA. Statistical significance was set at $p < 0.05$.

RESULTS

The study demonstrated that the structured care bundle significantly improved maternal knowledge and self-care practices compared with routine antenatal care. Significant improvement in AFI was observed during both follow-up assessments. Maternal parameters including fundal height, abdominal girth, fetal movements, and fetal heart rate showed statistically significant improvement, whereas maternal weight gain remained statistically non-significant.

Table 1: COMPARISON OF KNOWLEDGE SCORE BETWEEN PRETEST AND POSTEST

Group	Assessments				Mean difference	Student paired t-test
	Pretest		Post-test			
	Mean	SD	Mean	SD		
Experimental	13.14	2.36	20.50	2.76	7.36	t=11.45 p=0.001***(S)
Control	11.95	2.28	12.55	2.34	0.60	t=1.33 p=0.20(NS)

$p < 0.001$ very high significant S= significant

There was no significant difference in knowledge scores between the groups at baseline. Following the care bundle intervention, the experimental group showed a highly significant improvement in knowledge compared with the control group ($p < 0.001$), indicating the effectiveness of the intervention.

Table 2: COMPARISON OF PRACTICE SCORE BETWEEN EXPERIMENTAL AND CONTROL GROUP

assessment	Group				Mean difference	Student independent t-test
	Experimental		Control			
	Mean	SD	Mean	SD		
Pretest	17.59	3.02	19.23	4.02	1.53	t=1.64
Posttest	36.00	4.84	20.91	3.69	11.63	t=15.09 p=0.001***(S)

$P < 0.001$ very high significant S= significant

The experimental and control groups were comparable in practice scores during the pre-test. After the intervention, the experimental group demonstrated a significantly higher practice score than the control group ($p < 0.001$), confirming the effectiveness of the care bundle in improving self-care practices.

Table 3: Comparison of mean Amniotic fluid index values score During pre test, post-test-II, post-test III among experimental and control group

	Pre-test		Posttest-I		Posttest-II		Mean differe nce	Oneway Repeated measures ANOVA F-test
	Mean	SD	Mean	SD	Mean	SD		
Experim ental	5.18	.59	6.64	.58	8.23	.87	3.05	F=349.64 p=0.001*** (S)
Control	5.23	.61	6.05	.84	6.95	.84	1.65	F=26.66 p=0.001*** (S)

The mean AFI increased significantly over time in the experimental group compared with the control group. This finding indicates that the structured care bundle was effective in improving amniotic fluid volume among mothers with oligohydramnios.

Table 4: Comparison of experimental and control group Mean weight gain score During pre test, post-test-II, post-test III

Maternal parameters	Assessment	Group				Mean Difference	Student independent t=test
		Experimental (n=11)		Control (n=11)			
		Mean	SD	Mean	SD		
Weight gain	Base0	59.55	10.88	57.64	11.19	1.91	t=0.57 P=0.57 DF=42 (NS)

	1st observation	60.91	11.52	57.95	13.11	2.96	$t=0.79$ $P=0.43$ $DF=42 (NS)$
	2nd Observation	61.27	11.03	58.36	11.70	2.91	$t=0.85$ $P=0.40$ $DF=42 (NS)$
Fundal height	Base0	24.55	1.90	23.91	.75	0.64	$t=1.46$ $P=0.15$ $DF=42 (NS)$
	1st observation	26.95	.84	24.73	1.20	2.22	$t=7.11$ $P=0.001^{***}$ $DF=42 (S)$
	2nd Observation	29.95	.84	26.00	1.41	3.95	$t=11.26$ $P=0.001^{***}$ $DF=42 (S)$
Abdominal girth	Base0	74.73	2.00	74.82	2.04	-0.09	$t=0.15$ $P=0.88$ $DF=42 (NS)$
	1st observation	79.68	1.91	77.32	2.68	2.36	$t=3.37$ $P=0.01^{**}$ $DF=42 (S)$
	2nd Observation	85.05	2.10	78.18	2.52	6.87	$t=9.81$ $P=0.001^{***}$ $DF=42 (S)$
Fetal heart rate	Base0	138.18	10.55	140.00	5.94	-1.82	$t=0.70$ $P=0.49$ $DF=42 (NS)$
	1st observation	140.45	10.55	140.55	5.39	-0.10	$t=0.04$ $P=0.96$ $DF=42 (NS)$
	2nd Observation	145.77	10.76	140.36	5.15	5.41	$t=2.12$ $P=0.03^{*}$ $DF=42 (S)$
Fetal movements	Base0	7.32	.72	7.18	1.01	0.14	$t=0.52$ $P=0.60$ $DF=42 (NS)$
	1st observation	10.14	1.04	9.14	.94	1.00	$t=3.35$ $P=0.02^{**}$ $DF=42 (S)$
	2nd Observation	12.77	1.27	10.59	1.26	2.18	$t=5.72$ $P=0.001^{***}$ $DF=42 (S)$

NS = Not significant $P > 0.05$ is not significant S= significant

Table 4 compares the mean scores of selected maternal parameters between the experimental and control groups at baseline, first observation (4 weeks), and second observation (8 weeks). At baseline, there were no statistically significant differences between the two groups in maternal weight gain, fundal height, abdominal girth, fetal heart rate, and fetal movements ($p > 0.05$), indicating that both groups were comparable before the intervention.

Following the implementation of the structured care bundle, the experimental group demonstrated significant improvements in fundal height, abdominal girth, and fetal movements at the first observation ($p < 0.05$). At the second observation, statistically significant improvements were observed in fundal height ($t=11.26$, $p=0.001$), abdominal girth ($t=9.81$, $p=0.001$), fetal heart rate ($t=2.12$, $p=0.03$), and fetal movements ($t=5.72$, $p=0.001$) compared with the control group. However, maternal weight gain remained statistically non-significant throughout the study period ($p > 0.05$). These findings suggest that the structured care bundle positively influenced maternal and fetal physiological parameters associated with fetal well-being, although it did not produce a measurable effect on maternal weight gain during the observation period.

Positive correlations were identified among knowledge, practices, AFI, and maternal parameters, suggesting that improved maternal education and adherence to recommended practices contributed to better maternal and fetal outcomes.

DISCUSSION

The present study demonstrates that a structured nursing care bundle effectively enhances maternal knowledge, promotes self-care practices, and improves pregnancy outcomes among mothers with oligohydramnios. Improved AFI and favorable maternal parameters observed during follow-up support the importance of integrating nursing-led interventions into routine antenatal care. The findings are consistent with previous literature emphasizing maternal education, adequate hydration, nutritional support, and fetal surveillance in improving pregnancy outcomes among high-risk mothers.

CONCLUSION

The structured care bundle significantly improved knowledge, self-care practices, amniotic fluid index, and selected maternal parameters among mothers with oligohydramnios. Routine implementation of comprehensive nursing care bundles may contribute to improved maternal and neonatal outcomes and should be considered an integral component of antenatal care for high-risk pregnancies.

Ethical Clearance

Ethical approval was obtained from the Institutional Ethics Committee before commencement of the study.

Source of Funding

Self-funded.

Conflict of Interest

The authors declare no conflict of interest.