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Effectiveness of knowledge regarding hydration on level of amniotic fluid among mothers with oligohydramnios at selected Villupuram District

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ABSTRACT

RESEARCH Title: Effectiveness of knowledge regarding hydration on level of amniotic fluid among mothers with oligohydramnios at selected Villupuram district,

Oligohydramnios, a condition characterised by decreased amniotic fluid volume, is a significant obstetric concern associated with adverse maternal and fetal outcomes such as fetal distress, intrauterine growth restriction, preterm birth, and increased perinatal morbidity and mortality. Amniotic fluid plays a vital role in fetal development by providing mechanical protection, facilitating movement, maintaining temperature, and contributing to lung maturation. Among various contributing factors, maternal hydration status has been identified as a modifiable determinant influencing amniotic fluid index (AFI). Adequate maternal hydration has been shown to improve uteroplacental perfusion and increase amniotic fluid levels. Therefore, enhancing maternal knowledge of hydration may be an effective, low-cost intervention to manage oligohydramnios.

This study evaluated the effect of knowledge about hydration on amniotic fluid volume in mothers with oligohydramnios at Radhapuram PHC, Villupuram district. Study objectives were to assess baseline hydration knowledge, conduct a Structured Teaching Programme (STP), evaluate post-intervention knowledge, and determine the link between improved knowledge and amniotic fluid levels.

This study used a quantitative, pre-experimental, one-group pretest-posttest design. The sample comprised 50 antenatal mothers with oligohydramnios, selected through non-probability convenience sampling. Inclusion criteria were pregnancy with AFI <5 cm, willingness to participate, and ability to understand the questionnaire. Mothers with severe complications needing urgent care were excluded.

Data collection was carried out using a structured knowledge questionnaire developed by the investigator. The tool consisted of three sections: Section A included 10 items on demographic variables such as age, education, occupation, income, family type, gravida status, gestational age, history of oligohydramnios, dietary pattern, and source of health information. Section B included 5 items related to obstetric and clinical data, such as current AFI level, presence of medical complications, antenatal visits, medication intake, and daily fluid intake. Section C comprised 30 multiple-choice questions assessing knowledge regarding amniotic fluid, hydration, and the relationship between hydration and AFI. Each correct answer was awarded one mark, with a maximum score of 30.

The pretest was conducted to assess participants' baseline knowledge levels. Participants then attended a Structured Teaching Programme (STP) covering five topics: the importance of hydration, recommended fluid intake during pregnancy, signs of dehydration, dietary sources of fluids, and the role of hydration in improving amniotic fluid levels. The session used visual aids, charts, and interactive discussions to enhance understanding. Posttest assessment was conducted after a specified period to evaluate the intervention's effectiveness. Throughout, AFI levels were monitored by collecting ultrasound reports before and after the intervention to observe any clinical changes.

The study found that, during the pretest, most mothers had inadequate knowledge of hydration and its impact on amniotic fluid levels. Key contributing factors included low educational status, limited access to healthcare information, and socio-economic constraints. After the Structured Teaching Programme, participants' knowledge scores improved significantly. Posttest results highlighted a key finding: most mothers reached adequate levels of knowledge, demonstrating the educational intervention's clear effectiveness.

DATA ANALYSIS, RESULTS AND INTERPRETATION

Section I: Demographic Variables (n = 50)

S.No	Demographic Variables	Frequency	Percentage
1	**Age (years)**		
	< 20	5	10%
	21–25	20	40%
	26–30	13	26%
	31–35	8	16%
	> 35	4	8%
2	**Education**		
	No formal education	6	12%
	Primary	10	20%
	Secondary	18	36%
	Higher secondary	12	24%
	Graduate & above	4	8%
3	**Occupation**		
	Housewife	30	60%
	Daily wage	8	16%
	Private employee	6	12%
	Government employee	3	6%
	Self-employed	3	6%
4	**Monthly family income (₹)**		
	< ₹10,000	11	22%
	₹10,001 – ₹20,000	21	42%
	₹20,001 – ₹30,000	10	20%
	₹30,001 – ₹40,000	5	10%
	> ₹40,000	2	4%
5	**Type of family**		
	Nuclear	**35**	**70%**
	Joint	**15**	**30%**
6	**Dietary pattern**		
	Vegetarian	13	26%
	Non-vegetarian	37	74%
7	**Fluid Intake**		
	< 1 L	11	22%
	1–1.5 L	29	58%
	1.6–2 L	5	10%
	2.1–2.5 L	3	6%
	> 2.5 L	2	4%
8	**Source of health information**		
	Professionals	23	46%
	Family/friends	12	24
	Media(TV/internet)	10	20
	others	5	10

The majority of participants (40%) were aged 21–25 years, indicating that most mothers were in their early reproductive age. Regarding education, 36% had completed secondary education, while a smaller proportion had higher education. Most participants (60%) were housewives, reflecting limited occupational exposure and potential dependence on family members for health decisions. In terms of income, 42% belonged to the ₹10,001–₹20,000 income group, indicating a lower-middle socioeconomic status. A majority (70%) belonged to nuclear families. Regarding diet, 74% followed a non-vegetarian diet. Fluid intake analysis revealed that 58% consumed only 1–1.5 litres per day, which is below recommended levels. Professionals were the primary source of information for 46% of participants.

Section II: Clinical Variables

Clinical Variables	Frequency	Percentage
Gravida		
Primi	24	48%
G2	11	22%
G3	10	20%
≥ G4	5	10%
Gestational age (weeks):		
< 20 weeks	**0**	0%
21 – 24 weeks	**5**	10%
25 – 28 weeks	**10**	20%
29 – 32 weeks	**20**	40%
33 – 36 weeks	**10**	20%
> 36 weeks	**5**	10%
Previous history of oligohydramnios		
Yes	**10**	20%
No	**40**	80%
AFI Level		
< 5 cm	50	100%
Regular antenatal visit		
Yes	38	76%
No	12	24%
Medication intake		
Yes	**32**	**64%**
No	16	36%
Any medical complications		
Yes		
No	15	30%
Hypertension	26	52%
Diabetes Mellitus	6	12%
Anemia		6%
Others		0

A majority 48% were primigravida mothers. Most participants (40%) were in the gestational age group of 29–32 weeks. Eighty percent of mothers had no previous history of oligohydramnios.

All participants (100%) had AFI < 5 cm at baseline, confirming oligohydramnios. mothers (76%) attended regular Most antenatal checkups, and 64% were on medication. More than half (52%) had associated medical complications such as hypertension.

Section III: Knowledge Scores

Level	Pretest		Posttest	
	Frequency	Percentage	Frequency	Percentage
Inadequate	28	56%	3	6%
Moderate	17	34%	12	24%
Adequate	5	10%	35	70%

The higher pre-test scores indicate that a majority of mothers (56%, n=28) had inadequate knowledge. In the post-test, the highest proportion shifted to adequate knowledge, with 70% (n=35) of mothers demonstrating improved understanding.

This shift from inadequate knowledge in the pre-test to adequate knowledge in the post-test clearly reflects the effectiveness of the educational intervention in enhancing mothers' knowledge.

Table 9: Comparison of Pretest and Posttest Mean Scores Level

	Mean	Standard Deviation	Paired t-test Analysis	p-value
Pretest	12.4	3.2	**18.75**	**p < 0.001**
Posttest	24.6	2.8		

Effectiveness of STP

The mean knowledge score increased from 12.4 in the pretest to 24.6 in the posttest. The paired t-test value was 18.75 with a p-value less than 0.001, indicating a statistically significant improvement in knowledge after the intervention. The calculated t-value (18.75) is highly significant. **Effectiveness of STP**

Section V: AFI Level Improvement

Level	Pretest		Posttest	
	Frequency	Percentage	Frequency	Percentage
< 5 cm	50	100%	12	24%
5–8 cm	0		28	28%
9–12 cm	0		10	10%

Interpretation: Significant improvement in AFI after hydration intervention.

Hydration and AFI Relationship

The findings indicate a positive relationship between maternal hydration and improvement in Amniotic Fluid Index (AFI) levels. Increased daily fluid intake among mothers was associated with a significant increase in AFI levels at the posttest.

Initially, all mothers had low AFI levels (<5 cm). Following improved hydration practices, a significant proportion of mothers showed better AFI levels, with many shifting to 5–8 cm and some achieving normal levels of 9–12 cm. This suggests that adequate hydration plays a vital role in enhancing amniotic fluid volume.

Overall, the comparison highlights that improved maternal hydration contributed to a significant increase in AFI levels, emphasising the importance of fluid intake in the management of oligohydramnios.

Section VI: Association with Demographic Variables- Education vs Knowledge)

Education	**9.45**	**< 0.05**	**Significant**
Age	**2.31**	**> 0.05**	**Not Significant**
Gravida	**6.12**	**< 0.05**	**Significant**
Education	**9.45**	**< 0.05**	**Significant**
Age	**2.31**	**> 0.05**	**Not Significant**
Gravida	**6.12**	**< 0.05**	**Significant**

Association with Demographic Variables

Significant associations were found between knowledge scores and:

- **Education level**
- **Occupation**
- **Source of information**

No significant association was found with:

- **Age**
- **Gravida**
- **Family type**

Conclusion

The study concludes that:

- **Knowledge regarding hydration among mothers with oligohydramnios was inadequate before intervention.**
- **The Structured Teaching Programme was highly effective in improving knowledge.**
- **Improved hydration practices positively influenced amniotic fluid levels.**

Implications for Nursing Practice

- **Nurses should provide structured education on hydration.**
- **Antenatal clinics should include hydration counselling.**
- **Early detection and management of oligohydramnios should be prioritised.**

Recommendations

1. **Conduct similar studies with larger samples.**
2. **Implement regular health education programs.**
3. **Include family members in counselling sessions.**
4. **Use multimedia teaching methods.**

Limitations

- **Small sample size**
- **Limited to one PHC**
- **Short follow-up period**

Summary

This study demonstrated that a Structured Teaching Programme significantly improved mothers' knowledge of hydration in mothers with oligohydramnios. Improved knowledge led to better hydration practices and positively influenced amniotic fluid levels. The findings emphasise the importance of health education in improving maternal and fetal outcomes.

Furthermore, a positive association was observed between improved hydration practices and changes in amniotic fluid levels. Mothers who adhered to recommended fluid intake guidelines showed improvement in AFI measurements. This suggests that increased awareness and behavioural modification regarding hydration can improve maternal and fetal health outcomes. The study also identified significant associations between knowledge levels and selected demographic variables, including education, gravidity status, and source of health information.

The study emphasises the importance of health education as a key strategy in managing oligohydramnios. The Structured Teaching Programme proved to be an effective, economical, and feasible intervention in primary healthcare settings. Nurses and healthcare professionals play a crucial role in educating pregnant women about hydration and monitoring compliance. Integrating such educational programmes into routine antenatal care can enhance maternal knowledge, promote healthy practices, and reduce complications associated with low amniotic fluid levels.

In conclusion, the study demonstrated that improving maternal knowledge regarding hydration significantly influences the management of oligohydramnios by contributing to improved amniotic fluid levels. The findings highlight the need for continuous health education, early identification of risk factors, and regular monitoring of hydration status during pregnancy. Future research with larger sample sizes and experimental designs is recommended to further validate these findings and explore long-term maternal and neonatal outcomes.

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