EFFECTIVENESS OF SELF INSTRUCTIONAL MODULE ON KNOWLEDGE REGARDING FACTORS AFFECTING NORMAL FETAL GROWTH AND DEVELOPMENT AMONG ELIGIBLE COUPLES

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Background: Prenatal development includes the development of the embryo and of the fetus during a viviparous animal's gestation. It starts with fertilization, in the germinal stage of embryonic development and continuous in fetal development until birth. The factors which affecting normal fetal growth and development can be due to maternal, placental or fetal. Maternal factors include maternal size, weight, height, nutritional state, anemia, smoking, substance abuse, noise exposer etc. Placental factors include size, microstructure, umbilical blood flow, transporters and binding proteins, nutrient utilization and nutrient production and Fetal factors include the fetus genome, nutrient production, and hormone output. Inappropriate growth and development lead to low birth weight, fetal death.

Objectives: The aim of the study to assess the effectiveness of SIM regarding factors affecting normal fetal growth and development among eligible couples in selected rural community of Bangalore.

Design: A pre experimental one group pre-test posttest design was used for the study.

Subjects: The sample consists of 60 eligible couples in selected rural community of Bangalore.

Methods: A nonprobability purposive sampling technique was used to select the sample for the study.

Results: In the pre-test the sample had inadequate knowledge with the mean of 43.3% and standard deviation of 14.8 % where as in the post test there was significant gain in mean knowledge score of about 87.3% with the standard deviation of 10.1%.

Conclusion:. In the pretest majority of the respondents had inadequate knowledge Whereas in the posttest majority of the respondents had adequate knowledge. Thus the study indicates that he SIM was effective in enhancing the knowledge regarding factors affecting normal fetal growth and development.

Keywords: Effectiveness of self instructional module; knoeledge; fetal growth and development; eligible couple and prenatal development.

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1. INTRODUCTION

The women during the period of Labor is a vital period where care is very much important because for most of the women and families labor and birth is at a time of excitement, anticipation, anxiety. Giving birth to a child is major transition in women life so the main thing for women is having normal delivery, uncomplicated pregnancies and give birth to healthy child [1].

"Child development something that begins during infancy, the prenatal period considered an important part of the developmental process. Prenatal development is a time of remarkable change that helps set the stage for future psychological development and occurs in three main stages" [2]. "They are germinal, embryonic, and fetal. The germinal stage occurs from conception until 2 weeks, the embryonic stage lasts from implantation (2 weeks) until the 8th week of pregnancy. The fetal stage lasts from week 9 until the child's birth" [3].

"The start of pregnancy is actually the first day of last menstrual period called the 'menstrual age 'and is about two weeks ahead of when conception actually occurs. Each month group of eggs is recruited from ovary for ovulation and develop in small fluid- filled cysts called follicles. Normally, one follicle in the group is selected to complete maturation. This dominant follicle suppresses all the other follicles in the group, which stop growing and degenerate .The mature follicle opens and releases the egg from the ovary(ovulation).Fertilization occurs about two weeks after the last menstrualperiod." [4].

Fetal development is accompanied by various physiological, biochemical and hormonal changes. Often this influence demands for additional essential nutrients requirements to nurture a growing fetus. Maternal malnutrition is known to impair pregnancy outcomes" [5].

"Growth is for limited period and is measured whereas development takes place till death which is observed by matured behavior .Although the terms growth and development are used synonymously, they have different meanings biologically. Growth refers to physical characteristics such as height, weight , size etc. while development s refers to Qualitative changes to growth in a series of olderly and meaningful changes which lead to maturity. Growth is the result of concerned effect of a complex network of many regulatory factors with varying interaction. Each individual has a genetic base with a definite growth potential , which may modulated by these factors both in prenatal and in postnatal life" [6].

"The principle followed by growth and development are cephalocaudal , proximidistal, continuous process, is orderly , influenced by environmental and genetic factors, proceeds from simple to complex ,is individual difference , predictable etc " [7].

"Growth and development is complex process that depends on biological potential and environmental influences such as social, emotional and pathological factors. The factors affecting the normal growth and development of fetus can be maternal, placental, or fetal. Maternal factors include maternal size , weight ,weight for height ,nutritional state , anemia , high noise exposure , smoking, substance abuse or uterine blood flow .Placental factors include size , microstructure, umbilical blood flow , transporters and binding proteins. Fetal factors include the fetus genome, nutrient production, and hormone outcomes" [8].

"The placenta exerts its effects on the growth of the fetus from the beginning of pregnancy via metabolic and endocrine mechanisms. To achieve this, the placenta exchanges a wide array of nutrients, endocrine signals, cytokines and growth factors with the mother and the fetus" [9]."The placenta attaches a fetus to a woman's uterine wall, bringing maternal blood vessels close to fetal vessels. The important nutrients and other factors pass from the mother's blood into the fetal blood, helping support fetal growth and development." [10].

"The estimated 4 million neonatal deaths each year, more than 60% are associated with low-birth-weight due to intrauterine growth restriction and/or preterm delivery. In developing countries where 98% of the worldwide neonatal deaths occur." [11].

"Every day 67,385 babies are born in India, that's one sixth of the world's child births. Every minute one of these newborns dies. Maternal Mortality Ratio of India is122/ 100,000 live births in 2015-17. Globally the number of women and girls who die each year due to issues related to pregnancy and childbirth is 295,000 in 2017. In India the number of women and girls who die each year due to issues related to pregnancy and childbirth is 35000. Nearly 46 per cent of all maternal deaths and 40 per cent of neonatal deaths happen during labour or the first 24 hours after birth. Pre-maturity (35%), neonatal infection (33%), birth asphyxia (20%) and congenital malformation (9%) are the major causeofnewborndeath." [12].

A prospective cohort study conducted in Rotterdam, the Netherlands to investigate associations between modifiable maternal nutrition and lifestyle factors during the periconception period and embryonic growth. 342 women less than 13 weeks pregnant are

taken. At enrollment, women filled out a questionnaire regarding demographic and medical data and a validated food frequency questionnaire .Participants received multiple 3-dimensional ultrasound examinations up until the 12th week of pregnancy, and crown–rump length (CRL) and embryonic volume (EV) were measured by using V-Scope Virtual Reality software (version 1.0.0) in a Barco I-Space. Associations between maternal periconception vegetable and fruit intake, folic acid supplement use, smoking, and alcohol consumption and embryonic growth measurements were assessed. No or post conception initiation of folic acid supplement use was significantly associated with a 0.76 mm (-7.8%) and 1.63 mm (-3.7%) smaller CRL and a 0.01 cm3 (-19.5%) and 0.86 cm3 (-12.2%) smaller EV at 7+0 and 11+0 weeks of gestation, respectively. This conclude Maternal nutrition and lifestyle factors associated with embryonic growth [13].

2. METHODOLOGY

A pre experimental one group pretest posttest design was adopted for the study by the investigator with the aim to evaluate the effectiveness of SIM on knowledge regarding factors affecting normal fetal growth and development among eligible couples (15-45 years) who are resident in the selected rural community Bangalore. The investigator selected the sample by purposive sampling and introduced the base measure before and after planned exposure which is depicted as 01 and 02 respectively.

In the study all the eligible couples who have fulfill the inclusion criteria of availability and willing to participate in the study at the time of data collection, eligible couples who (15-45 years)who can read and write Hindi , English and kannada language are taken

as sample and the study exclude the eligible couple who are in medical and para medical profession, who cannot read and write and not available at the time of data collection. Sample size was calculated by the formula n = 2 [(Z1-α/2 +Z1-β)s /d]2 and taken 60 sample. The validity of the tool was maintained by expert's opinion in the field along with the tools and requested top give their suggestion regarding the tool for modification the tool consist of 10 demographic and 30 items question .and reliability of the tool (self-instructional module) was established by the Spearman brown's formula. The result showed the coefficient correlation r= 0.96. The pretest was conducted on the first day of data collection. After that SIM was administered and post test was conducted on the 7th day. The response are taken from couples. All the question are in multiple choice and each correct answer contain 1 mark and wrong 0 mark.

3. RESULTS

Here among the total 60 sample group the finding indicate that the majority 40 % of the respondents belong to the age of 26-35 years, 33.33 % of the respondents belong to 36-45 years , 15% belong to the age of 16-25 years and remaining 11.7% of the respondents belong to above 45 years with relation to gender majority of the sample 73.3% were women and 26.7% were male. Similarly 81.7% has heard about the factors affecting fetal growth and development as compaired to remaining 18.3% had not heard about factors affecting normal fetal growth and development. further regarding the source of information 38.4% had heard from social media followed by 28.3% heard from health professional, and 118.3% didn't heard and remaining 15% got from friend / relatives respectively.

Table 1. Pre test and post test knowledge regarding factors affecting normal fetal growth and development (N=60)

Knowledge Level	Category	Respondent pretest		Respondent posttest	
		Number	%	Number	%
Inadequate	<50 % Score	39	65.00%	0	0.0%
Moderate	51-75 % Score	21	35.00%	15	25.0%
Adequate	76 -100% Score	0	0%	45	75.0%
Total		**60**	**100%**	**60**	**100%**

Table 2. Overall pretest and post test mean knowledge scores on factors affecting normal fetal growth and development (N=60)

Aspects	Max. Score	Respondents Knowledge				Paired 't' test
		Mean	SD	Mean (%)	SD (%)	
Pre test	30	12.98	4.45	43.3	14.8	26.84%
Post test	30	26.18	3.03	87.3	10.1	
Enhancement	30	13.20	3.81	44.0	12.7	**20.38**

* Significant at 5% level, t (0.05, 59df) = 1.96

Table 1: The data presented depicts the classification of respondents with regards to their pretest knowledge level on factors affecting normal fetal growth and development. It is observed that the majority of the sample39 (65%) had inadequate knowledge and 21(35%) of them had moderate knowledge and none of the participant who participated in the study had adequate knowledge regarding factors affecting normal fetal growth and development. Whereas in post the majority 45 (75%) had adequate knowledge and 15(25%) had moderate knowledge respectively.

The above table shows that the respondents based on their overall mean pretest and post test knowledgescore. It is found that the mean pretest knowledge score was 43.3% (SD 14.8%) whereas themean post test knowledge scores was found 87.3% (SD 10.1%)and the enhancement meanknowledge was 44.0%(SD 12.7%)

During chi-square test there was significant association between selected socio-demographic variables (age group, educational level, number of children and heard about factors affecting normal fetal growth and development) and the mean pre-test knowledge score of eligible couples.

4. DISCUSSION

In the present study here the total 60 sample group the finding indicate that the majority 53.4% of the respondents belong to the Nuclear family, with relation to occupation majority of the sample 51.7% i.e autodriverSimilarly 46.7% had the monthly income of Rs.10000. The finding of the study is similar to the study conducted by Ch. Beaula Rani, P. Latha in which 66% were belong to Nuclear family , similarly 59% respondent is in homemaker occupation and 40% of the respondents had the income of 5001-7000. Thus, family size, occupational status and family income influence in the growth and development of fetus [14].

Similarly, the current study illustrated the majority of the sample 39 (65%) had inadequate knowledge and 21(35%) of them had moderate knowledge and none of the participant who participated in the study had adequate knowledge regarding factors affecting normal fetal growth and development. Whereas in post the majority 45 (75%) had adequate knowledge and 15(25%) had moderate knowledge respectively. The need for the effective program for the couples who are at high risk recommended to adopt intervention like self instructional module to increase the knowledge level regarding factors affecting normal fetal growth and development .

The finding of the study is similar to the result from the study conducted in hospital, in Narayana Medical college hospital and Narayana Superspeciality. A quantitative research approach was adopted to assess the effectiveness of SIM on knowledge regarding fetal development among antenatal mothers Hospital, Nellore. Sample size was determined by using single population proportion formula with the assumptions of 95% level of confidence, 10% proportion on knowledge of antenatal mothers on fetal development, 4% of margin of error. Finally considering a non response rate of 8%, the total size was calculated to be 500 antenatal mothers with all trimesters. Among them 250 assigned as experimental group and 250 as control group. The results reveals that effectiveness of SIM considering the overall aspects, antenatal mother's are gain more knowledge. This 60.82% of knowledge gain is the net benefit of the study which indicates the effectiveness of SIM [15].

Many research has conducted for the assessing the level of knowledge about factors affecting normal fetal growth and development. Thus materiality age, nutritional status, antenatal care, smoking, alcoholism, etc are main cause that influence fetal growth and development. So proper education is necessary to improve the knowledge level.

5. CONCLUSION

The result of the study shows that the eligible couples had inadequate knowledge regarding factors affecting normal fetal growth and development. The study also proved that the self instructional module is an effective method in improving their knowledge . thus the time is right to develop a proactive approach to factors affecting normal fetal growth and development . This approach may the following recommendation for practice.

- Develop a screening plan that is cost saving and screen in large mass to identify easily.
- A video assisted teaching program can be prepared to enhanced the knowledge levels of couples regarding factors affecting normal fetal growth and development

CONSENT

Informed consent was acquired from the participants.

ETHICAL APPROVAL

The study was approved by the researcher committee and a formal written permission was gathered from the authority of principal of Institute. My ethical clearance number is FET-175IEC-2020.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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