



ISSN Print: 2394-7500  
ISSN Online: 2394-5869  
Impact Factor: 8.4  
IJAR 2020; 6(12): 362-366  
[www.allresearchjournal.com](http://www.allresearchjournal.com)  
Received: 23-10-2020  
Accepted: 27-11-2020

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## A study to assess the effectiveness of Structured Instructional Module (SIM) on knowledge regarding fetal development among antenatal mothers in selected hospitals, Nellore

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### Abstract

**Background:** Life is truly wonderful! In fact, the development of fetus in the womb is just amazing. It is a phenomenon based on strictly regulated alteration of selective and non-selective transcription of DNA and RNA. Selective transcriptions are coupled with proteosynthesis, non-selective with cell division. Fetal growth is the primary method of assessment of fetal well-being and is an important determinant of health in later life. Development is related to biological system resulting from a selective, time related switching on and off of genes.

**Objectives:** To assess the knowledge regarding fetal development at various trimesters among antenatal mothers before and after SIM. 2. To associate the level of knowledge regarding fetal development with selected socio demographic variables of antenatal mothers before and after SIM.

**Materials and Methods:** A quantitative research approach was adopted to assess the effectiveness of SIM on knowledge regarding fetal development among antenatal mothers. Quasi experimental non-equivalent control group design was used to assess the effectiveness of structured instructional module on level of knowledge between the variables under each section. The samples were selected by using Non – probability convenience sampling technique. The setting of study in Narayana Medical college hospital and Narayana Superspeciality 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.

**Result:** The results reveals that effectiveness of SIM considering the overall aspects, antenatal mothers are gain more knowledge after the administration of the SIM. This 60.82% of knowledge gain is the net benefit of the study which indicates the effectiveness of SIM.

**Keywords:** Fetal Development, fetal growth, fetal movement, fetal position, placenta, umbilical cord, amniotic fluid and antenatal mothers.

### Introduction

Historically, it has been understood that the “natural order of the universe” consisted of man to the market place, woman at home with her family, woman the mistress of domesticity, man the master of all else, man the rational thinker, woman the guardian of morals, man dominant, and woman subordinate. The injection of equality between the two genders challenged the foundation of the social order. In 1916 the Amateur Athletic Union (AAU) holds its first national championship for Women.

Women’s competition in sports has been frowned upon by many societies in the past. The increase has been partly related to the drive for more women’s rights. In the United States, female student’s participation in sports was significantly boosted by the Act in 1972, preventing gender discrimination and equal opportunity for women to participate in sport at all levels. Pressure from sports funding bodies has also improved gender equality in sports. Female participation in sport has come a long way. Efforts have been and are being made in getting more females to participate in sports. However, a lot more effort is still required to generate greater female participation in the world of sports. Attitudes regarding female sport participation are changing as there are females who have made sport part of their daily lives.

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Fetal development is amazing to go from being a couple of cells to a total, albeit small, human being in the period of about nine months. The growth of the fetus is a continuous process that often conveys a sense of awe. The womb is expanding the fetus is growing and taking all the nourishment from the mother. Because the date of ovulation is often difficult to pinpoint, experts usually use the first day of the last period as the official beginning of the 40 weeks of pregnancy and as the starting point is calculating the fetus gestational age. EDD by LMP is calculated by adding 280 days to the first day of the last menstrual period [1].

Fetal development is influenced by mother's health. Mother's womb is the environment in which a fetus develops from a single cell to a baby. It experiences all that mother does emotions, chemicals, toxins and hormones [2].

Fetal development is dependent on hormones. Besides genetic potential and availability nutrition, optimal fetal development is influenced by number of hormones. 30 different hormones are secreted during pregnancy and are regulated by the complex interactions of mother's, fetal and placental endocrine systems. Placenta is the major control station for fetal hormones. It produces its own hormones and prevents the mother's hormones to flood fetal circulation [3].

An adequate nutrition is needed for a healthy fetus. A lack of iron results in anemia in the fetus, the lack of calcium can result in poor bone and teeth formation and lack of protein can lead to a smaller fetus and mental retardation. When a mother smokes during pregnancy the fetus is exposed to nicotine, tar and carbon monoxide. Nicotine results in less blood flow to the fetus because it constricts the blood vessels. Carbon monoxide reduces the oxygen flow to the fetus. Fetus produces megaloblastic red blood cells early in development, which become normoblastic near term [4].

In other words, a strategy to optimize fetal development, if implemented, would not only have immediate health benefits, but also cumulative benefit for personal and social health and development for over many decades to come and as such would be in close accord with Millennium Development Goals. Learning from inside the womb how fetus acquires skills before birth [5].

According to Andhra Pradesh. Dr. S. Indira *et al.*, (2017) preside over a study to assess the knowledge regarding fetal development among antenatal mothers. Optimal fetal development requires the potential mother to be in a good state of physical and emotional health both prior to, and during pregnancy.

To adequately support the development of fetus, an antenatal mother should possess adequate knowledge regarding the growing fetus from conception to safe delivery. For this, the antenatal mother should have knowledge regarding conception and fetal growth. This study has aimed to assess the knowledge regarding fetal development among antenatal mothers. The objective of study is to associate the level of knowledge regarding fetal development among antenatal mothers with selected socio demographic variables.

To provide an information booklet regarding fetal development. A quantitative approach was with an applied descriptive design, 100 antenatal mothers was selected by using non-probability convenience sampling technique. Study eventually revealed that, among 100 antenatal mothers, 76(76%) had inadequate knowledge and 24(24%) had moderately adequate knowledge regarding fetal development. This study encapsulate that, majority of the

antenatal mothers had inadequate knowledge regarding fetal development [6].

### Problem Statement

A study to assess the effectiveness of SIM on knowledge regarding fetal development among antenatal mothers in selected hospitals, Nellore.”

### Objectives of the Study

1. To assess the knowledge regarding fetal growth at various trimester among antenatal mothers before and after SIM.
2. To assess the knowledge regarding fetal movements among antenatal mothers before and after SIM.
3. To assess the knowledge regarding fetal position among antenatal mothers before and after SIM.
4. To assess the knowledge regarding development of placenta and umbilical cord among antenatal mothers before and after SIM.
5. To assess the knowledge regarding importance of amniotic fluid among antenatal mothers before and after SIM.
6. To associate the level of knowledge regarding fetal development with selected socio demographic variables of antenatal mothers before and after SIM.

### Methodology

**Research approach:** Quantitative research approach was adopted to assess the effectiveness of SIM on knowledge regarding fetal development among antenatal mothers.

**Research design:** Quasi experimental non-equivalent control group design was used to assess the effectiveness of structured instructional module on level of knowledge between the variables under each section.

**Setting of the study:** The study was conducted in Narayana Medical college hospital and Narayana Superspeciality Hospital, Nellore.

### Population

**Target Population:** The population for the study includes all the antenatal mothers.

**Accessible Population:** Antenatal mothers in selected hospital.

**Sample:** The sample for the present study was collected from antenatal mothers between 18 – 37 years.

**Sampling Technique:** Non-probability convenience sampling technique.

**Sample Size:** 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.

**Variables:** The factors included in this study are based on consideration in previous studies. Books, Journals, New papers Mass Medias, Workshop conferences.

**Independent Variables:** SIM

**Dependent Variables:** Knowledge regarding fetal development among antenatal mothers.

**Result and Discussion**

**Table 1:** Frequency and Percentage distribution of level of knowledge among antenatal mothers on fetal growth in experimental and control group.

Level of Knowledge	Experimental Group (n=250)				Control Group (n=250)			
	Pre – Test		Post – Test		Pre – Test		Post - Test	
	F	%	F	%	F	%	F	%
Excellent	-	-	143	57.2	-	-	-	-
Good	6	2.4	102	40.8	-	-	-	-
Average	132	52.8	5	2	155	62	155	62
Poor	112	44.8	-	-	95	38	95	38

Table-1 Shows that, in associated to level of knowledge among antenatal mothers on fetal growth in experimental group 6 (2.4%) were good, 132 (52.8%) were average, 112 (44.8%) were poor in pre – test and 143 (57.2%) were

excellent, 102 (40.5%) were good, 5 (2%) were average in posttest where as in control group, 155 (62%) were average, 95 (38%) were poor in pretest and 155 (62%) were average and 95 (38%) were poor in posttest.

**Table 2:** Frequency and percentage distribution of level of knowledge among antenatal mother on fetal movement in experimental and control Group.

Level of Knowledge	Experimental Group (n=250)				Control Group (n=250)			
	Pre – Test		Post – Test		Pre – Test		Post - Test	
	F	%	F	%	F	%	F	%
Excellent	-	-	177	70.8	-	-	-	-
Good	2	0.8	61	24.4	-	-	-	-
Average	83	33.2	12	4.8	105	42	105	42
Poor	165	66	-	-	145	58	145	58

Table-2: Shows that with regard to the level of knowledge among antenatal mother on fetal movement in experimental group, 2 (0.8%) were good, 83 (33.2%) were average, 165 (66%) were poor in pretest and 177 (70.5%) were excellent

61 (24.4%) were good, 12 (4.8%) were average in posttest where as in control group, 105 (42%) were average and 145 (58%) were poor in pretest and 105 (42%) were average and 145 (58%) were poor in posttest.

**Table 3:** Frequency and percentage distribution of level of knowledge among antenatal mother on fetal position in experimental and control group.

Level of Knowledge	Experimental Group (n=250)				Control Group (n=250)			
	Pre – Test		Post – Test		Pre – Test		Post - Test	
	F	%	F	%	F	%	F	%
Excellent	-	-	121	48.4	-	-	-	-
Good	-	-	123	49.2	-	-	-	-
Average	11	4.4	6	2.4	58	23.2	59	23.6
Poor	239	95.6	-	-	192	76.8	191	76.4

Table 3: Shows that In view of level of knowledge among antenatal mother on fetal position in experimental group, 11 (4.4%) were average, 239 (95.6%) were poor in pretest and 121 (48.4%) were excellent 123 (49.2%) were good and 6

(2.4%) were average in posttest where as in control group, 58 (23.2%) were average and 192 (76.8%) were poor in pretest and 59 (23.6%) were average and 191 (76.4%) were poor in posttest.

**Table-4:** Frequency and percentage distribution of level of knowledge among antenatal mother on development of placenta and umbilical cord in experimental and control group.

Level of Knowledge	Experimental Group (n=250)				Control Group (n=250)			
	Pre – Test		Post – Test		Pre – Test		Post - Test	
	F	%	F	%	F	%	F	%
Excellent	-	-	198	79.2	-	-	-	-
Good	-	-	49	19.6	-	-	-	-
Average	41	16.4	3	1.2	46	18.4	46	18.4
Poor	209	83.6	-	-	204	81.6	204	81.6

**Table – 4:** Shows that in associated to level of knowledge among antenatal mother on development of placenta and umbilical cord in experimental group 41 (16.4%) were average, 209 (83.6%) were poor pretest and 198 (79.2%)

were excellent, 49 (19.6%) were good, 3 (1.2%) were average in posttest. Where as in control group 46 (18.4%) were average and 204(81.6%) were poor in pretest and 46 (18.4%) were average and 204 (81.6%) were poor in posttest.

**Table 5:** Frequency and percentage distribution of level of knowledge among antenatal mother on importance of amniotic in experimental and control group.

Level of Knowledge	Experimental Group (n=250)				Control Group (n=250)			
	Pre – Test		Post – Test		Pre – Test		Post – Test	
	F	%	F	%	F	%	F	%
Excellent	-	-	70	28	-	-	-	-
Good	-	-	159	63.6	-	-	-	-
Average	82	32.8	21	8.4	79	31.6	79	31.6
Poor	168	67.2	-	-	171	68.4	171	68.4

**Table-5:** Shows that With regard to the level of knowledge among antenatal mother on importance of amniotic fluid in experiment group 82 (62.8%) were average, 168 (67.2%) were poor in pretest and 70 (28%) were excellent, 159

(63.6%) were good and 21 (8.4%) were average in posttest. Where as in control group, 79 (31.6%) were average, 171 (65.4%) were poor in pretest and 79 (31.6%) were average and 171 (68.4%) were poor in posttest.

**Table 6:** Comparison of Mean standard deviation between pretest and posttest of fetal development in experiment and control group.

Group	Criteria	Pre -Test		Post-Test	
		Mean	SD	Mean	SD
Experimental Group (n=250)	Fetal Growth	16.62	6.332	40.188	5.115
	Fetal Movement	4.132	2.381	15.1	7.76
	Fetal Position	0.988	1.497	9.96	1.765
	Development of placenta and umbilical cord	5.364	2.279	18.744	3.112
	Importance of amniotic fluid	5.8	2.534	13.84	3.230
Control Group (n=250)	Fetal Growth	16.076	4.242	18.288	5.85
	Fetal Movement	4.72	2.148	4.7	2.32
	Fetal position	2.884	1.633	2.84	1.629
	Development of placenta and umbilical cord	5.248	1.496	5.168	1.602
	Importance of amniotic fluid	4.56	1.723	4.56	1.727

**Association between the pretest and posttest level of knowledge on fetal growth in experimental and control group with selected socio demographic variables:** There is a significant association between the Pretest level of knowledge on fetal growth in experimental group trimesters, religion and Income, where as in control group Age, education, income, type of family and source of information were Significant. In posttest experimental group dietary pattern, where as in control group age, religion, education, income, type of family, dietary pattern and source of information were significant at the level of  $P < 0.05$ .

**Association between the pretest and posttest level of knowledge on fetal movement in experimental and control group with selected socio demographic variables:** There is a significant association between the Pretest level of knowledge on fetal movement in experimental group religion, education type of family and source of information. In posttest experimental group Religion, Income dietary pattern, where as in control group trimesters, education, type of family, dietary pattern and source of information were significant at the level of  $P < 0.05$ .

**Association between the pretest and posttest level of knowledge on fetal position in experimental and control group with selected socio demographic variables:** There is a significant association between the Pretest levels of knowledge on fetal position in experimental group Source of information where as in control group gravid and trimesters were Significant. In posttest experimental group dietary pattern and where as in control group Religion were significant at the level of  $P < 0.05$ .

**Association between the pretest and posttest level of knowledge on development of placenta and umbilical card in experimental and control group with selected socio demographic variables:** There is a Significant

Association between the Pretest level of knowledge on development of placenta and umbilical card in experimental group gravid, trimesters, education and dietary pattern, where as in control group trimesters, education, income and type of family were Significant. In posttest experimental group religion were significant at the level of  $P < 0.05$ .

**Association between the pretest level of knowledge on importance of amniotic fluid in experimental and control group with selected socio demographic variables:** There is a Significant association between the Pretest level of knowledge on importance of amniotic fluid in experimental group gravid, trimesters, education, income and source of information, Where as in control group trimesters, religion and education were Significant. In posttest experimental group gravid, Religion, education, income, type of family and dietary pattern were significant at the level of  $P < 0.05$ .

**Table 7:** Effectiveness of SIM on Fetal Development

Criteria	% of pretest knowledge	% of posttest knowledge	% of knowledge gain
Knowledge	26.53%	72.47%	45.935%

**Table-7:** Reveals the effectiveness of SIM considering the overall aspects, antenatal mother’s are gain more knowledge after the administration of the SIM. This 45.935% of knowledge gain is the net benefit of the study which indicates the effectiveness of SIM.

**Table 8:** Effectiveness of SIM on Development of Placenta and Umbilical Cord

	% of pre-test knowledge	% of post-test knowledge	% of Knowledge Gain
Knowledge	24.38%	85.2%	60.82%

Table-8: Show the effectiveness of the SIM considering development of placenta and umbilical cord aspects. The

antenatal mothers are gain more knowledge of the administration of SIM. This 60.82% of knowledge gain is the net benefit of the study which indicates the effectiveness of SIM.

**Table 9:** Effectiveness of SIM on Importance of Amniotic Fluid

	% of pretest knowledge	% of post-test Knowledge	% of Knowledge gain
Knowledge	29%	69.2%	40.2%

Table-9: indicates the effectiveness of the SIM considering importance of amniotic fluid aspects. The antenatal mothers are gain more knowledge after the administration of SIM. This 40.2% of knowledge gain is the net benefit of the study. This indicates the effectiveness of SIM.

### Nursing Implications

#### Nursing education

1. Nurses perform numerous tasks, from providing fundamental healthcare to assisting surgeons with advanced and critical procedures. Those interested in becoming a nurse, can pursue several educational options based on their career goals and level of care they hope to provide.
2. Nurses are the back bone of the health care systems universally and play a vital role in providing health care services globally. Nurses dispense comfort, compassion and caring without even a prescription.

#### Nursing administration

1. In the event of ever changing knowledge explosion, technological and ever-growing challenges of obstetric nursing, the administration has a responsibility to provide nurses with substantial continuing education opportunities.
2. This will enable the nurses in updating their knowledge, acquiring special skills and administrating high quality care by deputing them for in-service education programmes, special courses and workshops conferences can be arranged and attended by nursing staff.

#### Nursing research

1. The study has tested the usefulness of self-instructional module on knowledge among antenatal mothers. A new generation of nurse researchers is helping to improve patient care. Florence Nightingale is often seen as the very first nurse researcher.
2. Research provides the foundation for high-quality, evidence-based nursing care. However, there isn't a direct flow of knowledge from research into practice.

#### Nursing Practice

1. Knowledge is of no value unless you put it into practice. Nursing practice is essential to the delivery of high – quality care that optimizes patient's outcomes. 2. Studies continue to show improved outcomes when best practice is used in the delivery of patient care and therefore minimizing technological intervention.

#### Recommendations

To address the high maternal mortality rates, further research is required to conduct at a national level on midwifery practice to enable appropriate interventions to be introduced nationally. Health education measures should thus be introduced regarding fetal development and

expedited action is required to improve the knowledge of antenatal mothers at all levels.

### Conclusion

This study identifies important issues that are relevant to fetal development and recommends ways to reduce maternal and infant mortality rate through the descriptions of the lived experiences of antenatal mothers that were involved in development of fetus to build a future of a safer patient care environment in contemporary healthcare delivery systems. This is an opportunity where nurses can really make a positive difference to the experience of antenatal mothers during their pregnancy at their stressful time in their lives. Improving maternal health is one of the millennium development goals. Antenatal women form a large section of our society. However, in many families, these events may become a symbol of sorrow and grief where mothers depart from their babies and families because of inadequate and poor or nil maternal health services provided to these innocent mothers. These maternal deaths could be prevented by applying simple preventive measures. There is a need to target certain groups of population such as rural, uneducated and economically backward and find the way through which the knowledge should be increased regarding the fetus. Moreover, strong commitment, coordination, implementing, monitoring, evaluation and follow up of the programs regarding fetal development.

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