

## Impact of a Structured Prenatal Counseling on Anxiety Level among Women Undergoing Amniocentesis

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### Abstract

**Background:** Although amniocentesis is a common obstetric procedure, it is usually accompanied with higher level of anxiety related to anticipated pain, possible harm to pregnancy and testing results.

**Aim:** The aim of the study was to examine the impact of a structured prenatal counseling on anxiety level among women undergoing amniocentesis.

**Design:** Non-equivalent pre-post test Quasi experimental research design was utilized.

**Sample:** A convenient sample of 32 pregnant women undergoing amniocentesis was recruited through a period of one year (24 in study group) and (8 in control group).

**Setting:** The study was conducted in two settings; Fetal Medicine Unit at El-Manial University Hospital and Fetal Medicine and Diagnosis Unit at the National Research Center, in Cairo, Egypt.

**Tools:** Maternal assessment interviewing schedule, state/trait anxiety inventory (STAI), Miller Behavioral Style Scale (MBSS), pre/post comprehension questionnaire and counseling satisfaction scale (CSS) were used for data collection.

**Results:** The results showed that anxiety scores were decreased significantly immediately after application of counseling in the study group ( $t=19.88$ ,  $p= 0.000$ ) while anxiety scores did not show significant decrease two weeks after application of counseling ( $t= 0.353$ ,  $p= 0.727$ ). As regards difference between study and control group there were significant difference in anxiety scores immediately after counseling ( $t= 8.84$ ,  $p= 0.000$ ) while no significant difference was found two weeks after counseling ( $t= 1.257$ ,  $p= 0.218$ ).

**Conclusion:** The study concluded that application of pre-amniocentesis counseling decreased anxiety levels immediately before undergoing the procedure and has a little effect on the anxiety scores in the waiting period for the testing results.

**Recommendation:** The study recommended that informative counseling should be included in the routine nursing care for women undergoing amniocentesis

**Key words:** Prenatal Counseling, Anxiety, Amniocentesis

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## Introduction

Amniocentesis is the most common invasive procedure that is used for prenatal diagnosis of genetic disorders. It is usually performed for a variety of indications that include advanced maternal age, abnormal maternal serum screening and abnormal ultrasonographic findings (Cunningham et al., 2001). The diagnosis of fetal abnormality creates an uncertain outcome for the transitional process of becoming parents (Meleis et al., 2000; & Vand der Zalm and Byrne, 2006). A prenatal diagnosis of fetal anomaly is characterized as emotionally devastating and profoundly stressful event for women because it involves making difficult reproductive choices such as continuation of pregnancy with no intervention, elective termination, or, in some cases, experimental fetal therapy (Evans and Britt, 2004; Higgins, 2001; Leuthner et al., 2007; Rempel et al., 2004; & Singer, 2004).

Leithner et al., (2004), found that women undergoing diagnostic amniocentesis experienced acute distress. The typical amniocentesis candidate is afraid that the procedure will cause fetal abnormalities and anxious about pain she believes to be associated with procedure. Preventing or alleviating high anxiety during amniocentesis is important because anxiety may prolong the procedure and increases the probability of side effects (Van Zuuren et al., 2006). It is also documented that people prefer to be informed about their diseases, treatments and operations and it has been found that informing patients before procedure application lessens their anxiety level (Van Zuuren et al., 2006; & Clements and Melby, 1998).

The woman undergoing amniocentesis should receive appropriate teaching and preparation from the perinatal nurse (Howell and Adzick, 2003). The nurse should evaluate the woman's knowledge, give simple explanations regarding the fetal condition, inform woman about sensations that she may experience, measure baseline vital signs and fetal heart rate, palpate the fundus for fetal position and monitor fetal and uterine activity for 30 minutes before, during, and after the procedure. Moreover, the nurse should facilitate the communication of pertinent clinical information to all health care providers involved in care and advocates for the continuity of care as planned (Besuner and Imhoff, 2007).

### Significance of the study

The women undergoing amniocentesis in the Fetal Medicine Unit at El-Manial University hospital and Fetal Medicine and Diagnosis Unit at the National Research Center are receiving little explanation by the obstetrician regarding the procedure, the doctor usually has limited time, use sophisticated terminologies and also the woman might be unable to ask all questions to the doctor ; instead, the nurse is considered the more suitable person to assume this role as the nurse has more time and can use simple terms that woman can understand.

Indeed, the perinatal nurse is considered as one of the most important member in the multidisciplinary team who is providing care for pregnant women undergoing amniocentesis. Nurse has an active role in counseling women and their families, answering questions; dealing with women's worries and anxieties; so the nurse researcher is interested in applying a structured counseling for those women undergoing amniocentesis to identify the effect of counseling on their anxiety level.

#### Aim of the study

The aim of the study was to examine the impact of application of a structured prenatal counseling on anxiety level among women undergoing amniocentesis.

#### Hypotheses

To achieve the aim of this study; two research hypotheses were formulated:

H1. The women who will receive the structured prenatal counseling will have less anxiety score on STAI scale post counseling.

H2. The women who will receive the structured prenatal counseling will have less anxiety score on STAI scale than those who do not two weeks after procedure.

## Subjects and Method

#### Research Design

Non-equivalent pre-post test quasi experimental research design was utilized in this study

#### Sample

A convenient sample of 32 pregnant women undergoing amniocentesis was recruited through a period of one year that extended from December 2011 to November 2012 for both study and control group; (8) women in control group and (24) in study group. The control group was recruited in the first 3 months of data collection. The study was conducted in two settings; Fetal Medicine Unit at El-Manial University Hospital and Fetal Medicine and Diagnosis Unit at the National Research Center, in Cairo, Egypt.

#### Tools

Maternal assessment interviewing schedule

This tool was designed by the researcher; it included data related to age, educational level, degree of consanguinity, parity, gestational age, previous history of having babies with congenital anomalies, family history of congenital anomalies, experience with amniocentesis in previous pregnancies.

State/trait anxiety inventory (STAI) (Spilberger, 1983).

The STAI is a 40-item state trait anxiety inventory (STAI) was used to assess two distinct anxiety concepts; state anxiety (A-State) and trait anxiety (A-Trait) before and after counseling. It is a self-reported measure of anxiety that is reliable, sensitive to change, resistant to practice effect, and has been successfully used in other studies of psychosocial impact of predictive testing ( $r = \geq 0.90$ ) [14, 15]. Internal consistency estimates were  $r = \geq 0.88$  [16]. Summary scores from four-point Likert scales range from 20-80, with higher scores indicating greater anxiety. The scale was translated into Arabic and tested for validity and reliability by Abdelkhalek, 1984.

Miller Behavioral Style Scale (MBSS) (Miller & Mischel, 1986).

The 32-item Miller Behavioral Style Scale (MBSS) was used in this study to categorize the woman as information-seeker or information-avoidant. This instrument is comprised of four hypothetical stress situation; half are in response to physical threat, the other half to non-physical threat. Following each scenario are eight coping statements: four information-seeking (monitoring) options and four information-avoiding or distracting (blunting) options. Monitoring and blunting dimensions are negatively correlated ( $r = -0.41$ ) (Miller, 1987). Also; Test-retest analyses have shown the two subscales to be highly stable over four months:  $r = 0.72$  for monitoring and  $r = 0.75$  for blunting.

Pre/post comprehension questionnaire

The comprehension questionnaire developed by the researcher for this study consisted of ten multiple choice questions pertaining to information covered in the pre-procedure counseling session

Counseling satisfaction scale (CSS)

A ten-item, three-point Likert scale was included to provide estimate of the degree to which women agreed with positive statements regarding their counseling experience. The areas assessed are the length of time spent in the counseling, perceived helpfulness and value of session, the amount of information received and the suitability of counseling method used. Scores range from 0-20, with higher scores indicating greater satisfaction with provided counseling.

Ethical consideration

A written ethical approval was obtained from the ethical committee of the scientific research at the faculty of nursing Cairo University. In addition, official permission to perform the proposed study was obtained from authoritative personnel in Fetal Medicine Unit at El-Manial University Hospital and Fetal Medicine and Diagnosis Unit at the National Research Center. The purpose and nature of the study were explained to them, the investigator emphasized that the participation in the study is entirely voluntary. Anonymity and confidentiality also were assured.

## Procedure

Each woman in both study and control groups was interviewed individually to collect data related to socio-demographic status, obstetric history and present pregnancy; also each woman in study and control groups was asked to fill in Miller Behavioral Style Scale (MBSS), state/trait anxiety by STAI, and pretest knowledge assessment. Whenever the woman could not read and write or couldn't comprehend any statement or question; the researcher explained and clarified it to her and then document her answer. The interview lasted for 30-45 minutes with each woman.

Then, the researcher conducted the planned counseling session for the pregnant woman in the study group. Complete explanation was given regarding the indications of procedure, preparation, technique, possible complications, post procedure care and follows up. The woman was permitted to ask questions or clarify any statement she did not understand from the first time. The counseling session lasted for 45-60 minutes with each woman. Immediately after counseling; the state anxiety STAI and posttest knowledge assessment were measured. Also; satisfaction with counseling experience was measured using CSS.

Two weeks after procedure; state anxiety STAI and knowledge assessment were measured for both study and control groups in the ultrasound follow up visit by arrangement through telephone call.

## Results

As shown in table 1, the majority of women in both experimental and control group came from rural region and have a blood relation with their husbands. The table also shows that there are no statistical significant difference between study and control groups in relation to age, address, educational level and consanguinity which indicating equality between both groups as regards socio-demographic characteristics.

**Table 1: Difference between study and control groups regarding Socio-demographic characteristics**

	Study group (N= 24)	Control group (N=8)	Statistics	p
Age, years	Mean= 28.9 SD± 6.2 Range (25-41)	Mean= 29.6 SD±5.8 Range (23-40)	t=0.26	0.79
Address Rural Urban	n= 19 (79.2%) n= 5 (20.8%)	n= 6 (75%) n= 2 (25%)	$\chi^2=0.061$	0.80
Educational level Can't read and write Technical University	n= 3 (12.5%) n= 15(62.5%) n=6 (25%)	n= 2 (25%) n= 3 (37.5%) n= 3 (37.5%)	$\chi^2=1.60$	0.65
Consanguinity Relatives Not relatives	n=11 (45.8%) n=13 (54.2%)	n=5 (62.5%) n=3 (37.5%)	$\chi^2=1.09$	0.57

Table 2 illustrates that all women in experimental and control groups underwent mid-trimester amniocentesis. In addition, 79.2% in experimental group and 75% in control group have a history of having a child with congenital disease which is the main cause of referral for performing amniocentesis. There are no statistical significant differences between experimental and control groups in relation to gestational age, number of abortions, history of neonatal death, having child with congenital disease, experience with amniocentesis and cause of referral which indicating equality between both groups regarding obstetric profile.

Also, it is obvious from table 2 that two groups are equal in relation to their coping style as monitors or blunterners and in their trait and state anxiety scores.

**Table 2: Difference between study and control groups as regards baseline data of obstetric profile, coping style, anxiety level and causes of referral**

	Study group (N= 24)	Control group (N=8)	Statistics	p
Gestational age, weeks	Mean= 16.04 SD±1.3 Range (14-20)	Mean= 15.8 SD±1.1 Range (14-18)	t=0.311	0.75
No. of abortion <2 times ≥ 2 times	n= 20 (83.4%) n= 4 (16.6%)	n= 7 (87.5%) n= 1 (12.5%)	$\chi^2=2.06$	0.55
History of neonatal death Yes No	n= 10 (41.7%) n= 14(58.3%)	n= 3 (37.5%) n= 5 (62.5%)	$\chi^2=0.71$	0.7
Having child with congenital disease Yes No	n=19 (79.2%) n=5 (20.8%)	n=6 (75%) n=2 (25%)	$\chi^2=0.06$	0.8
Experience with amniocentesis Yes No	n=3 (12.5%) n=21 (87.5%)	n=0 n=8 (100%)	$\chi^2=1.1$	0.29
Cause of referral Having a child with congenital anomaly Abnormal ultrasound findings Recurrent abortions	n=18 (75%) n=4 (16.7%) n= 2 (8.3%)	n= 5 (62.5) n= 2 (25%) n= 1 (12.5%)	$\chi^2=0.46$	0.79
Coping style according to MBSS Monitors Blunterners	n= 15 (62.5%) n= 9 (37.5%)	n= 6 (75%) n= 2 (25%)	$\chi^2=0.416$	0.42
Trait STAI	Mean= 35.2 SD±4.1 Range (29-44)	Mean= 34.5 SD±6.5 Range (28-48)	t=0.383	0.70
State STAI	Mean= 56.33 SD± 6.52	Mean= 57.75 SD±5.77	t=0.546	0.58

Age, parity, having child with congenital disease and coping style found to be correlated with baseline state anxiety  $r=.357, .353, .354, .412$  at  $p < 0.05$  respectively table 3.

Using one-way repeated measures ANOVA to test the difference between baseline and follow up anxiety scores and knowledge assessment scores showed statistical significant difference  $p = < 0.001$  table 4.

Pair comparisons using paired t test showed significant difference between anxiety level before and immediately after application of structured counseling  $t = 19.88$  at  $p = < 0.001$ . As

well, there was a significant difference between knowledge assessment scores before and immediately after application of structured counseling  $t= 22.8$  at  $p= < 0.001$  table 4.

Also, there was a significant difference between knowledge assessment scores that measured immediately after application of structured counseling and that measured two weeks after counseling  $t= 3.41$  at  $p= < 0.05$  respectively. While there was no significant difference between anxiety level measured immediately and two weeks after counseling  $t= 0.353$  at  $p= 0.727$  table 4.

**Table 3: Correlation between age, parity, having child with congenital disease, coping style and baseline state anxiety**

	Baseline state anxiety	
	r	p
age	.357	.045*
number of para	.353	.048*
history of having child with congenital anomaly	.354	.046*
Coping style	.412	.019*

As shown in table 5, there was a significant difference between experimental and control groups in relation to anxiety level measured before amniocentesis  $t= 8.84$  at  $p= < 0.001$ . As well, there was a significant difference between two groups as regards knowledge assessment scores before amniocentesis and two weeks after the procedure  $t=23.64, 10.44$  at  $p=< 0.001$ . On the other hand, there was no significant difference between experimental and control groups in relation to anxiety level two weeks after counseling  $t= 1.257$  at  $p= 0.218$ .

The majority of women indicated that they were satisfied with the counseling provided by the researcher ( $M= 18.2 \pm 0.94$  on a 20-point CSS).

**Table 4 Effect of structured counseling on anxiety level and knowledge assessment scores in study group (n=24)**

	Before counseling	immediately after counseling	Two weeks after counseling	Statistics	p
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD		
State anxiety STAI score	56.33 $\pm$ 6.52	39.79 $\pm$ 4.69		$t= 19.88$	0.000
		39.79 $\pm$ 4.69	39.58 $\pm$ 5.54	$t= 0.353$	0.727
	56.33 $\pm$ 6.52	39.79 $\pm$ 4.69	39.58 $\pm$ 5.54	$F=69.68$	0.000
Knowledge assessment score	4.0 $\pm$ 1.25	9.87 $\pm$ .33		$t=22.8$	0.000
		9.87 $\pm$ .33	9.41 $\pm$ .82	$t=3.41$	0.002
	4.0 $\pm$ 1.25	9.87 $\pm$ .33	9.41 $\pm$ .82	$F= 324.6$	0.000

**Table 5: Difference between study group and control group on dependent variables (after application of counseling for study group)**

	Study group (N= 24)	Control group (N=8)	t test	p
	Mean $\pm$ SD	Mean $\pm$ SD		
State anxiety by STAI (before amniocentesis)	39.79 $\pm$ 4.69	57.75 $\pm$ 5.77	8.84	0.000
State anxiety by STAI (two weeks after amniocentesis)	39.58 $\pm$ 5.54	42.37 $\pm$ 5.06	1.257	0.218
Knowledge assessment score (before amniocentesis)	9.87 $\pm$ .33	3.25 $\pm$ 1.28	23.649	0.000
Knowledge assessment score (two weeks after amniocentesis)	9.41 $\pm$ .82	5.87 $\pm$ 0.83	10.441	0.000

## Discussion

The current study examined the effect of structured prenatal counseling on reducing anxiety level among women undergoing diagnostic amniocentesis. The study revealed that the main indication for procedure was history of having a child or more with congenital disease. The result was inconsistent with many studies conducted before as Karasahin et al., (2008); Chang et al., (2012); Harris et al., (2004); & Balciet al., (2011), which reported that the main reason for undergoing amniocentesis was advanced maternal age (AMA) followed by abnormal maternal serum screening; this might because increased cost of chromosomal testing and lack of awareness to the importance of prenatal diagnosis in case of advanced maternal age and consanguinity.

Baseline state anxiety scores was relatively high which was similar to the results reported by Nget al., (2004); Sakar et al., (2006); Vutura et al., (2012); & Tercyak et al., (2001) confirming claims that imminent amniocentesis is perceived as anxiogenic stressor. The higher state anxiety level might because of the invasive nature of procedure and unfamiliarity with it in Egyptian culture. The woman perceives it as strange to do any invasive practice in her pregnant womb.

Also, baseline state anxiety was correlated with women's information seeking coping style which revealed that monitors exhibited more anxiety than blunterners and was matched with the results of Van Zuuren, (2006) who found that higher monitors were more anxious than low monitors and that high blunterners were more anxious than low blunterners and was also compatible with Miller, (1980); Miller, (1987); Miller, (1995); & Miller et al., (1996) while Tercyak et al., (2001) did not find the same results.

Post counseling, women demonstrated good comprehension of information contained within the counseling session and there was a statistical significant difference between study and control groups in relation to knowledge level immediately after counseling and two weeks later. This was in agreement with Phipps and Zinn (1986); & Ormond et al., (1996) who revealed that counseling has been shown to be beneficially affecting patient's knowledge. The



importance of this variable as outcome of counseling is its contribution to the process of valid informed consent to genetic testing and to ensure that woman was adequately familiar with basic information about the procedure (Lerman et al., 1997).

The level of anxiety was decreased significantly after application of structured counseling for study group as well as there was a difference between study and control group in relation to state anxiety before amniocentesis. This result was congruent with all reports of all studies conducted before; Balci et al, (2011) who studied the effect of pre amniocentesis counseling on maternal pain and anxiety in three points of measurements for 240 women in Turkey found that the medium value of anxiety felt by patient significantly decreased before and after counseling. In Tercyak et al., (2001); the 100 women who accept to undergo amniocentesis after genetic counseling exhibited significant decrease in baseline anxiety compared to post counseling anxiety scores.

Ng et al., (2004) who studied the effect of counseling in 157 in Singapore and measured anxiety level at 5 points before and after counseling, immediately before amniocentesis, after results disclosure and 4 to 6 weeks after procedure reported a significant decrease in anxiety scores after application of counseling.

In spite of relative decrease in anxiety scores two weeks after counseling there was no statistical difference in anxiety level after counseling and two weeks later. This result was incongruent with that of Ng Cet al., (2004); & Tercyak et al., (2001) in which change scores reflected an average decrease in anxiety after meeting the counselor. This might because of worrying about the results of genetic testing.

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