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Original Article

Assessment of Knowledge, Attitude and Practices of Pregnant Women regarding Oral Health

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1.ABSTRACT

Background: Periodontal status of pregnant women is one of the most important issue of oral health to be considered at pregnancy. According to a report given by the American Dental Association, around 60% to 75% of pregnant women have gingivitis **Aim**: This study aimed to assess knowledge, attitude and practices of pregnant women regarding oral health **Design**: A descriptive cross sectional study design was used. **Study subject**: A purposive sample was used to select 192 pregnant women **Setting**: Antenatal Clinics at Bani-Ebaid Specialist Hospital. Three tools were used for data collection: Structured Interview questionnaire to assess socio-demographic characteristics, Obstetric history and women's knowledge about oral health, Attitude toward oral health Likert scale & Practices of oral health. **Results**: The present study results show that (67.2%) of the studied women have fair knowledge regarding oral health. Less than half of them agreed with the important of regular dental checkup even if no problem &about 38.5% of them had false believe that fetus is responsible for teeth loss during pregnancy. Majority (85.4%) of studied women brush teeth more than once a day & (83.3%) of them visit the dentist during pregnancy if problem occur. **Conclusion:** More than two third of the studied sample had fair knowledge regard oral health during pregnancy, most of the studied sample had positive attitude about oral health. Also, most of them had satisfactory practice especially visiting dental clinic when had any problems. **Recommendation**: Conducting heath education sessions to increase awareness of pregnant women about the importance of oral health during pregnancy.

Keywords: Attitude**,** knowledge, oral health, practices, periodontal health and pregnant women

2. Introduction:

Pregnancy is a physiological process characterized by increased levels of hormones which strongly influence the periodontal status of women (**Gil-Montoya et al., 2021**). Pregnancy can affect the mother's oral health, increasing their susceptibility to oral diseases that have been associated with harmful effects on the newborn. Despite the severity of oral diseases during pregnancy, the demand for dental care during the gestational period is low, which may improve with the participation of midwives in promoting oral health activities (**Touriño Loureiro et al., 2021).**

Oral health was recently re-defined as being a multi-faceted condition including the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort or disease of the craniofacial complex **(Marla et al., 2018)**. Periodontitis is a destructive inflammation of the periodontium affecting approximately around 30% of child bearing age women. Periodontal disease is a common chronic inflammatory condition called gingivitis. Untreated gingivitis results in a loss of connective tissue and bone around the teeth **(Watson & Tuggle, 2019)**.

Maternal oral diseases such as gingivitis, caries and periodontal infection affect a woman's oral health and the oral health of children. Increased levels of estrogen and progesterone during pregnancy lead to exaggerated gingival tissue response to dental plaque, thereby increasing the risk of pregnancy gingivitis which is extremely common, and affects about 30% to 86% of all pregnant women **(Uwambaye et al., 2020)**.

Dental caries is the second most important disease of the oral cavity in pregnancy. Active dental caries if left untreated can lead to local as well as systemic complications. The presence of dental caries during pregnancy, especially after birth, represents an increased risk of early childhood caries development. Cariogenic bacteria can be transmitted through the saliva to the oral cavity of infant (**Chawla et al., 2017**). Approximately 40 % of pregnant women experience periodontal disease. Due to the prevalence and health consequences associated

with oral health during this sensitive period, improving perinatal oral-systematic health has been identified as a priority area by the National Institutes of Health Office of Research on Women's Health.

Pregnant women who have recognized the knowledge of their personal control over oral health have a high possibility of taking up self-care behavior. Attitude towards oral health of an individual impacts oral self-care habits and affects the ability of an individual's care towards teeth. As a nurse play a vital role in educating community on oral hygiene, it is essential to know the oral health knowledge, attitude, and behavior at the community level (**Selvaraj et al., 2021**).

Significance of the study:

The main reason was higher prevalence of dental problems seen among the pregnant women than the general population due to hormonal variations and dietary changes that occur during pregnancy. Epidemiological evidence suggests that periodontal disease is associated with increased risk for adverse pregnancy and birth outcomes, including pre-eclampsia, low birth weight, preterm birth, spontaneous abortion, and stillbirth **(Raju & Berens, 2021)**. Also oral health screening was not a routine procedure in many antenatal clinics, and there are no standard guidelines which ensure that all pregnant women are routinely screened, treated, or referred to specialized dental professionals as part of prenatal care**.** Knowledge, practices and attitude of pregnant women in low-income countries are rarely examined. Approximately (47.4%) of pregnant women in Egypt did not know about the importance oral health **(Khalaf et al., 2018).** Also, No study done at Mansoura University regarding this issue, so it should be considered as an important study to reduce burden of oral problems especially during pregnancy.

Aim of the study:

This study aimed to assess knowledge, attitudes, and practices of pregnancy women regarding oral health.

Research Questions:

Does pregnant woman have knowledge regarding oral health?

What is the attitude of pregnant woman regarding oral health?

Does pregnant woman practice oral health during pregnancy?

3. Methods

Study design:

Across-sectional descriptive study design was used.

Study setting: The study was conducted at antenatal clinic in Bani-Ebaid Specialist Hospital in Egypt. It consists of a big clinic for patient's admission, a clinic for ultrasound, and internal section contains three patient wards, laboratory, and operating room. Nearly more than 150 patients per week visit the outpatient for treatment and care. The outpatient provides many services such as prenatal, antenatal and postnatal follow up, fertilization follow up through ultrasound, and family planning services.

Sample type: A purposive sample was used.

Study sample: One hundred ninety two pregnant women who attended the previous mention setting and fulfilled the following criteria:

Inclusion criteria:

- Pregnant women at reproductive age.

Exclusion criteria:

- Pregnant women who complain from dental problems and seek for medical intervention
- Pregnant women who complain from chronic diseases that may affect oral health such as DM.

Sample size:

Calculating sample size for studying the knowledge, attitude and practice of pregnant women about oral health hygiene, through Clin Calc.com sample size calculator software, at 5% ∞ error (95.0% significance) and 20.0% β error (80.0% power of the study), assuming the percentage of daily cleaning of the teeth is 52.6.0% **(Khalaf et al.,2018)** and its percentage in our locality may be about 1 0.0% more (62.6). Based on the above formula, the sample size required for the study was 192 pregnant women.

Tools of data collection:

Tool I: **Structured Interview questionnaire**:

It consists of three parts; **Part (1)**: It includes socio-demographic characteristics of the pregnant women such as age, level of education, occupation, family income, residence. **Part (2):** Obstetric history which includes gravidity, parity, obstetric and neonatal complications and number of children, **Part (3): Pregnant woman's knowledge regarding oral health**: It was developed by the researcher to assess women's knowledge about oral health. It includes 30 questions about causes of dental caries and gum disease, symptoms of gum

disease, food protect against dental and gum disease, types of food that protect teeth and gums, importance of teeth cleaning, awareness about the relation between dental diseases and pregnancy.

Scoring system: Each items of knowledge was scored 1 if yes and 0 if no. Total knowledge scores was grouped as poor knowledge if less than 50.0% of the total scores, fair knowledge range from 50.0% to 75.0% and good knowledge if it is equal to 75.0% and above **(Khalaf et al., 2018)**.

Pregnant woman's knowledge regarding oral health Questions: It was developed by the researcher to assess women's knowledge about oral health. It includes questions about causes of dental caries and gum disease, symptoms of gum disease, food protect against dental and gum disease, types of food that protect teeth and gums, importance of teeth cleaning, awareness about the relation between dental diseases and pregnancy. Each items of knowledge was scored 1 if the answer was correct and was scored zero if the answer wasn't correct. Total knowledge scores was grouped as poor knowledge if less than 50.0% of the total scores, fair knowledge range from 50.0% to 75.0% and good knowledge if it is equal to 75.0% or more **(Khalaf, Osman, Abbas & Ismail (2018)**.

Tool II: **Attitude toward oral health Likert Scale:**

It was adopt from **(Khalaf et al., 2018)** to measure attitudes of pregnant women toward oral health. It consists of 12 statements such as regular dental checkup, dental problems, no relation between oral & dental health of the mother and the child health during and after delivery, etc……The responses to the 12 statements were based on a three-point Likert Scale (agree, uncertain and disagree). Items were scored (3, 2 and 1) respectively; the score was reversed for negative statements. Total scores were calculated which ranged from 12-36, the higher score was the positive attitude toward oral health Negative Attitude (<50.0%) & Positive Attitude (≥ 50.0%) **(Khalaf et al., 2018)**

Tool III: **Practices regarding oral health questions:** It was adopted from **(Khalaf et al., 2018)** to assess practices of pregnant women regarding oral health such as daily cleaning of the teeth, using proper technique in cleaning procedure, assess any problem in teeth, visiting the dentist during the current pregnancy, causes of the visit, visiting the dentist during the current pregnancy, causes for not going to the dentists during the pregnancy and the answer was "yes" or "no"

Scoring system: Each items of practice was scored 1 if yes and 0 if no. Total practice scores was grouped as satisfactory practice if more than 50.0% & unsatisfactory practice if less than 50.0% of the total scores, it was consisted of six sentences.

Validity of the study tools:

Before conducting the current study, content validity of the study tools was determined after reviewing the literature then confirmed by five expertises of Woman's Health and Midwifery Nursing department Assist. Prof: Nadia Yousef, Assist. Prof: Eman A. Fadel, Assist.Prof: Hanan Awad, Dr: Nehmedo Ezzat and Dr: Shimaa Fouad, Faculty of Nursing, Mansoura University. Based on expertises suggestions, minor modifications were done as simplify some statement to be easy understood and the final form was used for data collection. The tools were translated into Arabic then back translated into English by bilingual Arabic expertise.

Reliability:

Tools were tested for its content reliability by statistical tests such as Cronbach's Alpha equation to test the internal consistency of tool items. The reliability of the tools was showing high reliability values of knowledge, attitude, and practice which were (0.834 & 0.901 & 0.937, respectively).

Pilot study:

A pilot study was carried out with 10% (19 women) of the study sample who attended at antenatal clinic in Bani-Ebaid Central Hospital to evaluate the clarity and applicability of the tools that were used in the study before the start of data collection as well as to estimate the time needed for answer. The results of the pilot study didn't included in the sample size and according to the data analysis of pilot results, modifications of the tools were done as paraphrasing of some sentences.

Ethical Consideration

- Ethical approval letter was attained from research ethics committee of the Faculty of Nursing, Mansoura University.
- An official permission was taken from the head of Bani-Ebaid antenatal clinics, responsible physicians to obtain the official permission to conduct the study after explaining the aim of the study.
- Informed consents were attained from every pregnant women involved in the study & after clarification of the nature objective of the study.

- The participants were reassured about the Anonymity, privacy, safety & confidentiality of the collected information throughout the whole study.
- The participants were informed about their rights to refuse participation or withdraw from the study at any time.

Study procedure:

The process was carried out through two phase; preparatory and operating phase. Preparatory phase included: reviewing literature, developing tools and pilot study while the operating phase included; data collection and data analysis.

Preparatory Phase:

It included reviewing the local and international relevant literature and theoretical knowledge about the various aspect of the study using articles, books, journals to select data collection tools and make necessary modifications, then pilot study was performed.

Operating phase:

Data Collection Phase:

The researcher introduced herself to head of Antenatal clinics, then a written permission was obtained from the head of Bani-Ebaid Central Hospital and the responsible physicians to conduct the study after clarification of the aim of study. The researcher attended Bani-Ebaid Central Hospital clinics for three days per week from 9:00 A.M. to 1:00 P.M .The researcher introduced herself to women, obtained written consent from them to be included within the study after clarification of the study aim. The researcher interviewed each woman individually for 20-30 minutes, during the interview; the researcher read every item of the data collection sheet & clarified its meaning to the woman. Women were allowed to ask for any interpretation, elaboration or explanation. The researcher asked the woman and recorded her answers in the data collection sheet.

Data Analysis Phase:

The collected data were sorted, organized, categorized, transferred into especially designed formats and then statistically analyzed using SPSS program (Statistical package for the social sciences) version 21. The data were properly tabulated and presented. Statistical descriptive measures as number, percentage, mean and Standard Deviation (mean± SD) for quantitative data was used. Association between categorical variables was tested using Chi-square test($x2$). The association in this study was considered statistically significant at p value ≤ 0.05 and highly statistically significant at p value < 0.001.

4. Results:

Table one shows that more than one third (35.9%) of the studied sample aged from 20- < 25 years, (50%) was secondary education. More than half of them were housewives and live in rural area (57.8% and 55.7% respectively). About (41.1%) of studied sample had insufficient incom**e.**

Table two shows that more than half (57.8%) of the studied sample were multipara & had 2-3 gravid respectively. About (57.3%) of them were 25-34 weeks of gestation.

Figure (1): Shows that (67.2%) of the studied women had fair knowledge related to oral health during pregnancy. While only (31.8%) of them had good knowledge.

Table(3) represent that (47.9%) of the studied sample agreed with the importance of regular dental checkup even if there wasn't any dental problem and dental problems can lead to other health problems. About (38.5%) of the studied sample had false believe that the fetus is responsible for teeth loss during pregnancy due to absorbs calcium from his mother. More than half (51.6%) of them had false believed that taking fruits & vegetables.

Table (4) showed that (85.4%) of pregnant women brush teeth more than one a day, (83.3%) of them visit the dentist during pregnancy when problem occurs &limit frequent consumption of sugary food, also (81.8%) of them having dairy products that rich in calcium. On the other hand (40.6%) of the studied sample didn't make proper teeth care & (31.8%) of them didn't drink fresh healthy drinks.

Table (5) Shows that there was statically significant relationship between knowledge, attitude and practices scores and both of age, education as the association was considered statistically significant at p value ≤ 0.05 and highly statistically significant at p value < 0.001.

Table (1): Socio-demographic characteristics of pregnant women:

Characters	No (192)	%
Age (year)		
- < 20	7	3.6
- 20-	69	**35.9**
- 25-	45	23.4
- 30-	62	32.3
- 35+	9	4.7
Mean ± SD = 27.94 ± 5.70		
Education		
- Illiterate	20	10.4
- Basic education	25	13.0
- Secondary	96	**50.0**
- University	51	26.6
Occupation		
- Housewife	111	**57.8**
- Employee	81	42.2
Resident		
- Rural	107	**55.7**
- Urban	85	44.3
Income		
- Insufficient	79	**41.1**
- Sufficient	70	36.5
- Sufficient & save	43	22.4

Table (2): Obstetric history of the pregnant women:

Characters	No (192)	%
Gravidity		
One	27	14.1
2 -3	111	**57.8**
4+	54	28.1
Parity		
None	27	14.1
One	30	15.6
2-3	111	57.8
4+	24	12.5
Abortion		
None	174	90.6
One	18	9.4
Number of living children		
None	27	14.1
One	30	15.6
2-3	111	57.8
4+	24	12.5
Current gestational age		
< 24 weeks	14	7.3
25 – 34 weeks	110	57.3
≥35 weeks	68	35.4
Mean ± SD (31.16 ± 5.91)		

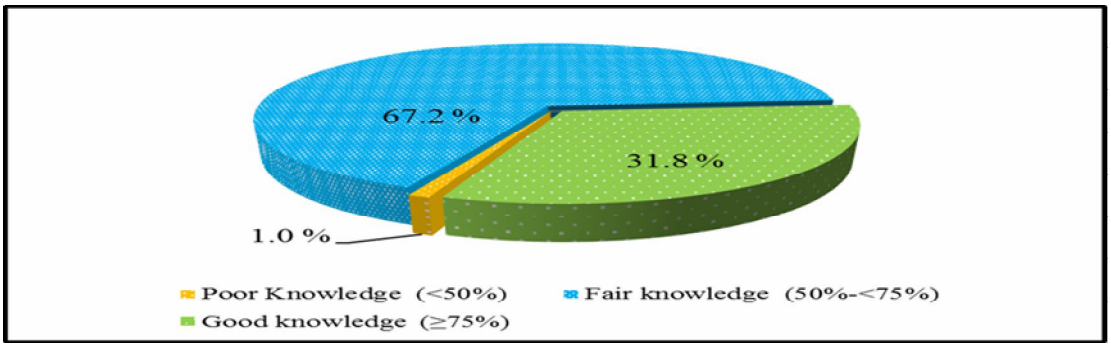

Figure (1): Knowledge level of the pregnant women related to oral health

(Table 3): Pregnant women attitude toward oral health (n= 192)

True Believes	Agree		Equivocal		Disagree	
Score	**3**		**2**		**1**	
	No	**%**	**No**	**%**	**No**	**%**
Regular dental checkup is important even if there wasn't any dental problem	92	47.9	59	30.7	41	21.4
Tooth brushing is important for the milky teeth after its appearance	69	35.9	89	46.4	34	17.7
Think that dental problems can lead to other health problems.	92	47.9	84	43.8	16	8.3
Think that it is important to keep the child mouth healthy and clean	88	45.8	61	31.8	43	22.4
Regular dental checkup is important for the milky teeth	97	50.5	42	21.9	53	27.6
False Believes	**Agree**		**Equivocal**		**Disagree**	
Score	**1**		**2**		**3**	
	No	**%**	**No**	**%**	**No**	**%**
Think that the fetus is responsible for teeth loss during pregnancy as he/she absorbs calcium from his mother	74	38.5	91	47.4	27	14.1
No relation between oral & dental health of the mother and the child health during and after delivery	24	12.5	75	39.1	93	48.4
It is necessary to extract any painful tooth	61	31.8	39	20.3	92	47.9
Taking fruits & vegetables has no role in the dental and oral health.	28	14.6	65	33.9	99	51.6
No need for management of cavities or caries of the child milky teeth if they are not painful	47	24.5	86	44.8	59	30.7
Mean ± SD 22.03 ± 3.03						

Table (4): Practices of pregnant women toward oral health (n= 192)

Practice activities	No (0)		Yes(1)	
	No	**%**	**No**	**%**
-Visit the dentist during pregnancy when any periodontal problem occurs.	32	16.7	160	83.3
-Make proper teeth care to prevent dental caries.	78	40.6	114	59.4
-Limit frequent consumption of sugary foods and snacking.	32	16.7	160	83.3
-Brushing teeth more than once a day	28	14.6	164	85.4
-Having dairy products that rich in calcium.	35	18.2	157	81.8
-Drinking fresh healthy drinks and avoid carbonated beverages (soda)	61	31.8	131	68.2
Mean ± SD 4.61±1.04				

Table (5): Relationship between knowledge, attitude and practice scores of pregnant women's according to age and education:

Characters	No	Knowledge score	Attitude score	Practice score
		Mean ± SD	Mean ± SD	Mean ± SD
Age (year)				
- < 20	7	14.86±0.69	22.14 ± 3.62	4.43±1.40
- 20-	69	15.23±2.34	21.51 ± 2.75	4.81±0.73
- 25-	45	14.82±2.32	21.96 ± 3.53	4.22±1.11
- 30-	63	18.18±2.44	22.35 ± 2.85	4.71±1.19
- 35+	9	19.22±2.05	22.67 ± 3.04	4.56±0.88
Significance test		F=22.52,P<0.001	F=18.584,P<0.001	F=2.502,P<0.05
Education				
- Illiterate	20	14.60±1.81	20.55 ± 1.93	4.85±**0.68**
- Basic	25	15.24±2.06	21.20 ± 2.02	4.20±**1.08**
- Secondary	96	16.10±2.86	22.67 ± 2.40	4.47±**1.02**
- University	51	17.71±2.69	21.76 ± 4.33	5.00±**1.06**
Significance test		F=9.119,P<0.001	F=3.918,P 0.010	F=4.943,P<0.01

5. Discussion

The present study was implemented to assess knowledge, attitude and practices of pregnant women regarding oral health. The study aim was supported by the study finding. The findings of the present study answered the research questions regarding the knowledge, attitude and practices of pregnant women regarding oral health, the present study revealed that more than two thirds of studied sample had fair knowledge regard oral health, most of them had positive attitude and most of them had satisfactory practice regard oral health.

The present study finding revealed that more than one third of pregnant women aged from 20- < 25 years. The present study results were in agreement with a descriptive study conducted by **Selvaraj et al (2021).** To assess oral health knowledge, attitude, and behaviour and its association with sociodemographic and habitual factors of South Indian population, they reported that the majority of the study population was aged from 18-24 it may be due to early age of marriage in this region than another.

While a contradicting study conducted by **Khalaf et al. (2018)** to assess oral health knowledge, attitude and practices among pregnant women in Assiut Governorate they reported that the majority of sample were aged ≤ 30 years. It disagreed also with the study of **Azarshahri et al. (2022)** to assess oral health knowledge, attitudes, and practices of women who had given birth in the United States within the past 2 years, that the average participant age was approximately 30 years old.

The present study finding revealed that about half of the pregnant women were live in rural area. Contradictly, a descriptive study conducted by **Chaitra et al. (2018)** to evaluate knowledge, attitude, and practice of oral health and adverse pregnancy outcomes among rural and urban pregnant women of Moradabad, India, reported that the majority of the participants were live in urban area. Also, the study of **Nguyen et al. (2020)** done on Australian midwives regarding the periodontal health of pregnant women to inform inter professional antenatal care that aimed to evaluate the knowledge, attitudes and practice, they reported that more than three-quarters of the participants practiced in an urban setting,

Also, the present study finding revealed that more than half of studied women were housewives and more than two fifths were employee. This finding was similar to the finding of a descriptive study conducted by **Ramamurthy & Irfana (2017)** to assess and compare the level of knowledge and attitude towards periodontal oral health among pregnant women, they reported that approximately three fifth of pregnant women were unemployed and two fifths were employed.

The present study results showed that one third of pregnant women had good knowledge about oral health. This finding did'nt agree with study conducted by **Azizah et al. (2021)** they reported that two - thirds of the studied women already had good knowledge regarding oral health care. Regarding to responses of knowledge about oral health, the present study revealed that one-third of the pregnant women answered that bleeding gums was a symptom of gum diseases. This study finding was in disagreement with a descriptive study conducted by **Penmetsa et al. (2018)** they evaluated the oral health knowledge among pregnant women visiting and not visiting a dental professional they found that more than half had bleeding gums it can be observed from their results that more than half of responded that red bleeding gums were a common finding during pregnancy.

In the current study, the most of studied samples had a positive attitude toward oral health during pregnancy, as they acknowledged not only the importance of oral healthcare during this period of life but also how to improve their oral health. The present study results were in line with **Touriño et al. (2021)** they determine the knowledge, attitudes, and practices of Spanish midwives and midwifery students regarding oral health in pregnant women; and to identify the barriers faced by these healthcare professionals in addressing oral health promotion during pregnancy, as majority of them agrees that the awareness of the importance of oral hygiene during pregnancy is essential and most of them agree that maintaining oral health during pregnancy is important. So positive attitude and adherence to good oral hygiene behavior will result in better oral health.

In addition to the study of **Hoerler, Jenkins & Assad (2019)** who reported that attitudes towards oral health by the half of respondents were positive agreeing that they should be trained to perform oral health screenings and four fifth agreeing that they should update their knowledge regarding oral health during pregnancy. Only about quarter felt that it was not their responsibility to look into the patient's mouth to detect oral health problems so differences of attitude from woman to another can affect the results.

The present study finding revealed that practice level of studied sample related to oral health were satisfactory practice. In the contrasts **Chawla et al. (2017)** they reported that the majority consumed sugar-containing food stuff during pregnancy. Only less than tenth of the pregnant women brushed their teeth twice a day and nearly tenth visited a dentist every 6 months these contrasts because of differences of technics of periodontal teaching from one area to another. The current study finding show that the majority of the pregnant women had brushing teeth more than once a day. This results were supported by a study conducted by **Agrawal et al. (2017)** they assess knowledge, attitude and practice of oral health care in pregnant women in north India found that more than three fifth of pregnant women brushed their teeth once daily and only one third of pregnant women brushed their teeth twice daily.

6. Conclusion:

More than two third of the studied sample had fair knowledge regard oral health during pregnancy, most of the studied sample had positive attitude and had satisfactory practice toward oral health during pregnancy.

7. Recommendations:

Based on the results of the present study, the following recommendations were suggested:

- Conducting educational programs to increase knowledge of pregnant women about the importance of oral health during pregnancy
- Dental health education by the media and antenatal care should be promotedFurther researches are needed to:
- Assess the effect of oral health intervention in the pregnant women on the onset of early childhood caries among their children
- Assess the barriers that hinder pregnant women to be aware about oral health during pregnancy

8.Acknowledgment:

Researcher offer their appreciation and gratitude to all pregnant women contributed in the study for their cooperation during the research process and all thanks to the health team for their invaluable assistance during the study.

9.Conflicts Of Interest Disclosure:

The authors declare that there is no conflict of interest.

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