# The task force method for tooth brushing compliance behavior in pregnant women

El método del grupo de trabajo para el comportamiento de cumplimiento del cepillado de dientes en mujeres embarazadas

Morita Sari* Email: Morita.Sari@ums.ac.id Faculty of Dentistry, Universitas Muhammadiyah Surakarta (UMS), Indonesia
Sukma Fitrianggita E-mail: sukma.idta.fitrianggita@gmail.com Faculty of Dentistry, Universitas Muhammadiyah Surakarta (UMS), Indonesia
Corresponding author: Morita Sari

Received/Recibido: 11/24/2021 Accepted/Aceptado: 02/19/2022 Published/Publicado: 02/25/2022 DOI: http://doi.org/10.5281/zenodo.6480169



## Abstract

**Introduction**: Pregnant women experience complex physiological changes, affecting the oral and the baby's health. Dental and oral health maintenance behavior by brushing teeth properly and correctly is one way to prevent the severity of pregnancy gingivitis and restrain the risk of low birth weight and premature birth. In addition, intervention is an attempt or way to intervene or interfere, inhibiting the development of disease in humans.

**Objective**: The purpose of this study was to verify the difference in compliance with tooth brushing behavior before and after the use of the task force method in pregnant women in the second trimester.

**Methods**: This study used a comparative analytic quasi-experimental method with a pretest-posttest design approach. The samples studied were 61 pregnant women in the second trimester, with the sampling method using purposive sampling, but only 56 samples of pregnant women were analyzed. Methods of data collection employed a questionnaire. Meanwhile, the research data analysis utilized the Kolmogorov-Smirnov normality test and continued using the paired t-test.

**Results**: The analysis results using the paired t-test showed that the mean tooth brushing behavior compliance from the pretest and posttest results was 7.13 and 9.55, with a mean difference of 2.43. Using the paired t-test, the analysis results revealed a significant difference, with a p-value of <0.05.

**Conclusion**: There is a significant difference in the compliance of tooth brushing behavior before and after the use of the task force method in pregnant women in the second trimester.

**Keywords**: Pregnant women, brushing teeth, behavior, task force

## Resumen

**Introducción**: Las mujeres embarazadas experimentan cambios fisiológicos complejos, afectando la salud bucal y del bebé. El comportamiento de mantenimiento de la salud bucal y dental mediante el cepillado de dientes adecuado y correcto es una forma de prevenir la gravedad de la gingivitis del embarazo y limitar el riesgo de bajo peso al nacer y parto prematuro. Además, la intervención es un intento o forma de intervenir o interferir, inhibiendo el desarrollo de enfermedades en humanos.

**Objetivo**: El propósito de este estudio fue verificar la diferencia en el cumplimiento de la conducta de cepillado de dientes antes y después del uso del método de fuerza de tarea en mujeres embarazadas en el segundo trimestre.

**Métodos**: Este estudio utilizó un método cuasi-experimental analítico comparativo con un enfoque de diseño de pretest-postest. Las muestras estudiadas fueron 61 gestantes en el segundo trimestre, con el método de muestreo mediante muestreo intencional, pero solo se analizaron 56 muestras de gestantes. Los métodos de recolección de datos emplearon un cuestionario. Mientras tanto, el análisis de datos de la investigación utilizó la prueba de normalidad de Kolmogorov-Smirnov y continuó usando la prueba t pareada.

**Resultados**: Los resultados del análisis utilizando la prueba t pareada mostraron que el cumplimiento medio de la conducta de cepillado dental de los resultados de la prueba previa y posterior fue de 7,13 y 9,55, con una diferencia de medias de 2,43. Usando la prueba t pareada, los resultados del análisis revelaron una diferencia significativa, con un valor p de <0,05.

**Conclusión**: Existe diferencia significativa en el cumplimiento de la conducta de cepillado dental antes y después del uso del método task force en gestantes en el segundo trimestre.

**Palabras clave**: mujeres embarazadas, cepillado de dientes, comportamiento, grupo de trabajo

Pregnant women undergo complex physiological changes, which can affect oral health and pregnancy outcomes. Particular circumstances in pregnancy, such as cravings, anemia and mental instability, make pregnant women less concerned with personal hygiene[1,2]. Physiological changes in pregnant women are also followed by changes in the oral cavity condition[3]. In addition, increased estrogen and progesterone levels, changes in dietary habits, vomiting, and aversion to the taste of toothpaste and mouthwash make pregnant women less likely to maintain oral hygiene, thereby increasing plaque formation during pregnancy and placing women at risk for caries and periodontal disease[4].

During pregnancy, vascular permeability increases, causing swelling of the gingiva. Decreased epithelial keratinization weakens the role of the epithelium as a protector. If a lack of attention to oral hygiene, plaque, and multiply microorganisms accompany these changes, it can lead to gingivitis and periodontitis. Clinical symptoms of pregnancy gingivitis are seen from the second month of pregnancy and reach a peak in the eighth month[5,6].

Bleeding in the gingiva can occur at any time due to minor stimuli, such as brushing teeth or even without stimulation. A decrease in the severity of gingivitis can occur two months after delivery, and the gingival condition can return to normal after one year. However, the gingiva will not return to normal if the teeth' local factor (plaque) is not removed. The study results uncovered an association between gum disease (gingivitis and periodontitis) and adverse pregnancy outcomes, such as low birth weight and premature birth[7,8]. Premature birth is one of the leading cause of perinatal mortality which closely related with poor systemic health condition[9].

Moreover, research results from the Academy of General Dentistry expose that pregnant women who suffer from dental and oral health problems are 3-5 times more likely to give birth to premature babies. Meanwhile, pregnant women who suffer from gingivitis have a higher risk of giving birth to premature babies with low birth weight. Another study proved about the appearance of syndrome metabolic such as renal failure, diabetes type 2, cardiovascular disease, central obesity, hypertension, artherogenic dyslipidemia and dysglycemia due to low Vitamin D absorption during the body development and further severe condition can lead to neurocognitive for patient with diabetes if left untreated[10,11]. Therefore, fostering good oral health in women during pregnancy is an ideal early intervention and good public health policy. Oral health promotion, disease prevention, early detection, and timely intervention are crucial aspects for maternal and child oral health. Interventions are ways to prevent disease. Behavioral interventions can be performed through coercion so that people change their health behavior using pressure. This effort can be indirectly in the form of laws or regulations (law enforcement) and instructions (task force) and directly through pressure (physical or non-physical) and sanctions[7,12-14].

Specifically, a task force is a formation established to carry out a specific task. Taskforce can be carried out on children and adults by 1) screening (checking the initial situation); 2) taking necessary preventive action according to the case; 3) determining risk factors; 4) performing an examination (final check). Screening is done to determine the initial state of the patient. Then, preventive actions supervised by health workers are adjusted to the occurring case. For example, in cases of caries and gingivitis, preventive measures can be taken in the form of brushing, gargling, and flossing; in the case of fluorosis, water fluoridation, fluoride supplementation, and others can be carried out as needed. These preventive actions can be accompanied by conducting health education to observe the risk factors for the case. Meanwhile, an examination checks the results of preventive actions, which are usually carried out by professionals[15,16]. In addition, according to dentistry experts from the American Dental Association (ADA), maintaining individual oral hygiene can be done by brushing teeth with a frequency of at least twice a day and a duration of 2-3 minutes, with gentle movements and not too fast. In this case, duration is one of the essential factors affecting a toothbrush's efficacy in removing dental plaque. Brushing teeth to remove dental plaque takes 30-45 seconds in each quadrant of the teeth[17].

A good toothbrush technique is needed to get maximum results. The correct brushing technique is to brush the teeth on the vestibule and labial part using a vertical motion. The exterior and interior of the teeth also employ vertical motion, with slight rotational motion along the tooth axis. It will help remove debris in the interdental teeth. On the masticatory or chewing surface, namely the premolars and molars, brushing is carried out with horizontal movements to remove food debris stuck in the pits and fissures[18,19].

To remove plaque in adults, dentists often recommend the modified bass technique to improve oral hygiene. The vibratory (bass) technique is used for daily brushing by positioning the toothbrush tilted at an angle of 45°, brushing the buccal part of the teeth starting from the distal in a back-and-forth motion, and brushing the palate on the molars and premolars with the tip of the bristles[17,20].

## Methods

This research applied a comparative analytic quasi-experimental study with a pretest-posttest design approach, conducted during July-August 2019. Before the task force method intervention, validity and reliability tests were carried out by distributing untested questionnaires to 30 respondents with the same inclusion criteria. The obtained data were then validated by looking at the value of r Pearson correlation with r table on SPSS using bivariate correlation analysis. The reliability test was performed using the Cronbach Alpha r value and r table. The results of the validity and reliability test of the questionnaire show that the items are valid and reliable for all questions. After validation, a questionnaire pretest was conducted on tooth brushing compliance and continued with counseling/promotion of dental health and mouth in pregnant women. After four weeks, a posttest questionnaire on tooth brushing compliance was carried out. Then, the data were analyzed.

The sampling was performed using the purposive sampling method on pregnant women at Sangkrah Community Health Center, Surakarta City. The sample size studied was 61 pregnant women, with the following inclusion criteria:

1. Gestational age in the second trimester
2. Could read and write well
3. If the hand is handicapped, other people could help to fill out the questionnaire with the questionnaire answers purely from the pregnant woman.

Pregnant women were given an explanation about the purpose of the study and filled out the informed consent; then, they brushed their teeth in a good and correct way every day. The frequency of brushing teeth was twice a day in the morning after breakfast and at night before going to bed with a duration of 2-3 minutes. The tools used were a toothbrush and fluoride toothpaste. Brushing activities were recorded on a four-week brushing schedule, which the husband/guardian at home supervised.

The research data obtained were processed utilizing the SPSS statistical software program. The data analyzed were only data from participants who had participated in the study from beginning to end, performed task force well, and had filled out a complete brushing schedule. The research data analysis test used was the Kolmogorov-Smirnov normality test, which was then continued using the paired t-test.

## Results

Respondents analyzed in this study were pregnant women in the second trimester, as many as 56 respondents from a total of 61 pregnant women respondents. They followed the study course from beginning to end and carried out a task force of teeth brushing for four weeks (had filled out a complete brushing schedule). Meanwhile, the remaining five pregnant women respondents were not analyzed, even though they had followed the research from beginning to end as they did not perform the task force well (did not fill out the complete brushing schedule); thus, they were deemed not to have compliance in brushing their teeth. Table 1 shows that of the 56 pregnant women respondents, the most significant number were pregnant women with a gestational age of five months, with a total of 33 (58.93%), and there was a small proportion of four months of gestation, with a total of 23 (41.07%).



**Table 1. Frequency distribution of pregnant women respondents based on gestational age**

| Gestational age (months) | (n) | (%) |
|---|---|---|
| 4 | 23 | 41.07% |
| 5 | 33 | 58.93% |
| Total | 56 | 100% |

Table 2 displays that of the 56 pregnant women respondents, the most significant number were pregnant women with the second pregnancy order, with a total of 24 pregnant women respondents (42.86%). Meanwhile, the lowest number was pregnant women with the fifth pregnancy order, with 0 pregnant women respondents (0%). Furthermore, the distribution of the characteristics of pregnant women respondents based on maternal age can be seen in Table 3, whereas the distribution based on education level can be seen in Table 4. As many as 58.93% of pregnant women aged between 20-29 years, while 3.57% of pregnant women aged under 20 years. Pregnant women with the last education of senior high school were 69.64%, junior high school was 25%, and college was 5.36%.

**Table 2. Distribution of pregnant women respondents by pregnancy order (parity)**

| Parity | (n) | (%) |
|---|---|---|
| 1 | 14 | 25% |
| 2 | 24 | 42.86% |
| 3 | 11 | 19.64% |
| 4 | 6 | 10.71% |
| 5 | 0 | 0% |
| 6 | 1 | 1.79% |
| Total | 56 | 100% |

**Table 3. Frequency distribution of pregnant women respondents based on maternal age**

| Maternal age (years) | (n) | (%) |
|---|---|---|
| < 20 | 2 | 3.57% |
| 20-29 | 33 | 58.93% |
| 30-39 | 21 | 37.50% |
| Total | 56 | 100% |

**Table 4. Distribution of pregnant women by education level**

| Level of education | (n) | (%) |
|---|---|---|
| Elementary school graduate<br>Junior high school graduate<br>Senior high school graduate<br>College graduate<br>Amount | 0<br>14<br>39<br>3 | 0 %<br>25%<br>69.64%<br>5.36% |
| Total | 56 | 100% |

Furthermore, the results of the distribution of the characteristics of pregnant women respondents based on the occupation of pregnant women, as can be seen in Table 5, had the highest score of 47 (83.93%) in pregnant women respondents with worked as housewives, while the lowest value was 2 (3.57%) in pregnant women who worked as private employees. In the pretest-posttest score results for 56 pregnant women, the minimum pretest score was 4, and the maximum pretest score was 13. Meanwhile, for the posttest, the minimum score was 8, and the maximum score was 14.

**Table 5. Distribution of pregnant women respondents by occupation**

| Occupation | (n) | (%) |
|---|---|---|
| Housewife<br>Entrepreneur<br>Private sector employee | 47<br>7<br>2 | 83.93%<br>12.5%<br>3.57% |
| Total | 56 | 100% |

The mean value for the pretest was 7.13, with a standard deviation of 1.663, and the mean value for the posttest was 9.54, with a standard deviation of 1.321, as listed in Table 6. The data on the pretest and posttest scores were then analyzed by the Kolmogorov-Smirnov normality test, as in Table 7. The table also exhibits the significance value of Asymp. sig. (2-tailed) of 0.129 ($p>0.05$). Thus, according to the basis for decision making in the Kolmogorov-Smirnov normality test, it can be concluded that the data were normally distributed. Therefore, the normality requirements were met, and further analysis could be carried out, namely the paired t-test analysis. The analysis results can be seen in Table 8, revealing a significant difference in compliance with tooth brushing behavior in 56 pregnant women. The obtained sig. (2-tailed) was 0.000 ($p<0.05$), with a difference of -2.43 (CI or confidence interval of -2.17 to -2.68). The value of $p<0.05$ and CI did not pass zero. In addition, the difference between pretest-posttest (difference) was >2, which was 2.43. For this reason, statistically, there was a significant difference in the mean pretest-posttest results before and after four weeks of the task force intervention period; hence, the paired t-test results in this study can be declared valid, or Ho was rejected.

**Table 6. Characteristics of pregnant women respondents based on the respondent's behavior score in the compliance of tooth brushing behavior**

| Statistical value | Pretest | Posttest |
|---|---|---|
| Number of Respondents | 56 | 56 |
| Minimum | 4 | 8 |
| Maximum | 13 | 14 |
| Mean | 7.13 | 9.54 |
| Std. Deviation | 1.663 | 1.321 |

**Table 7. Kolmogorov-Smirnov analysis results**

| | Kolmogorov-Smirnov Test |
|---|---|
| | Asymp. sig. (2-tailed) |
| Pretest-Posttest | .129 |

**Table 8. The paired t-test analysis results on differences in tooth brushing behavior compliance before and after the use of the task force method for pregnant women in the second trimester**

| (n=56) | Mean | Difference | CI (95%) | Sig. (2-tailed) | P-value |
|---|---|---|---|---|---|
| Pretest<br>Posttest | 7.13<br>9.55 | 2.43 | 2.17 – 2.68 | 0.000 | <0.05 |

## Discussion

In the study results of the characteristic, from a total of 56 pregnant women respondents regarding the compliance of tooth brushing behavior during the task force intervention, most mothers aged five months of pregnancy as many as 33 respondents (58.93%) and mothers aged four months of pregnancy as many as 23 (41.07 %), which can be seen in Table 1 above. Both were pregnant women in the second trimester of pregnancy. In this regard, clinical symptoms of pregnancy gingivitis can be seen since the second month of pregnancy, namely the group of pregnant women in the first trimester. However, in the second month of pregnancy, pregnant women usually feel lethargic, nauseated, and vomiting due to hormonal changes, so that they are lazy to keep their teeth and mouth clean, according to research conducted by Jeihooni (2017).

This study involved respondents in the second trimester of pregnant women because, at this time, the state of lethargy, nausea, and vomiting had decreased. The feeling of laziness to maintain dental and oral hygiene should be reduced so that behavioral compliance could be seen. Regarding the distribution of the characteristics of pregnant women respondents based on the order of pregnancy (parity) in Table 2, most of them were pregnant women with a second pregnancy order as many as 24 (42.86%) pregnant women. Another small percentage were pregnant women with the first pregnancy order as many as 14 (25%) pregnant women, the third pregnancy order as many as 11 (19.64%) pregnant women, the fourth pregnancy order as many as six (10.71%) pregnant women, the sixth pregnancy order as many as one (1.79%) pregnant woman, and finally, the fifth pregnancy as many as 0. Pregnant women with the first to sixth pregnancy order in this study stated that it was the first time they received counseling or promotion of dental and oral health since local midwifery staff had never promoted oral health to pregnant women and only advised them to have their teeth and mouth checked during pregnancy[6].

These results are consistent with the fact that one of the causes of pregnant women's dental and oral health problems is the lack of maternal knowledge about health. Lack of knowledge causes a person's awareness of maintaining dental hygiene to be unrealized. The lack of awareness will impact the respondent's lack of interest in maintaining oral health; thus, there is no process of adopting a new behavior. As proposed in the behavioral adoption theory by Notoadmodjo (2014), behavior change begins with awareness, interest (interested in the stimulus), evaluation (weighing whether the stimulus is good), trial (trying a new behavior), and adoption (having adopted a new behavior).

Moreover, maternal age during pregnancy is one of the risk factors for premature birth. Pregnant women who are less than 17 years old or older than 35 years old during pregnancy have a greater risk of having a premature baby than pregnant women between 17-35 years old. Pregnant women who are older than 35 years are at high risk of complications and, in the end, can cause babies to be born prematurely. In this study, the age of pregnant women affected the changes in the compliance of tooth brushing behavior in five respondents who were not obedient to their teeth-brushing behavior, in which they were over 35 years old. In addition, in the distribution of the characteristics of pregnant women respondents based on the education level, most of them were senior high school graduates, as many as 39 pregnant women respondents (69.64%), and a small proportion were junior high school and college graduates, namely 14 (25%) and three (5.36%) pregnant women.

The questionnaire of tooth brushing behavior compliance filled out by pregnant women respondents consisted of the frequency, brushing teeth duration and time, brushing tools, and how to brush teeth. In this case, the husband's role as a supervisor for brushing the teeth in pregnant women for four weeks in this study's results corroborates with Gamelia's (2013) research, which exposed that the husband's involvement in pregnancy care through emotional, instrumental, and informational support greatly influenced the health of pregnant women. Increased post-test scores also indicated improved compliance with tooth brushing behavior in pregnant women with the task force intervention method. It was in the form of a task force for brushing teeth according to a schedule with coercive supervision of the husband/guardian and education through dental and oral health counseling, causing the impact of changes in behavior to maintain dental and oral health more quickly[14,21].

In this study, proper and correct maintenance of dental and oral health has supported the realization of dental and oral health, including the health of pregnant women in general. Compliance with tooth brushing behavior of pregnant women increased after the task force method was carried out for four weeks, seen from the questionnaires filled out by pregnant women with pretest and post-test results. In the tooth brushing schedule, 56 pregnant women revealed good brushing behavior compliance with the task force or the assigned task because they had filled out the complete brushing schedule for four weeks. Meanwhile, the remaining five pregnant women demonstrated a lack of compliance with brushing behavior as the brushing schedule was not entirely filled from the beginning of the intervention period to the end. In the third and fourth weeks, pregnant women rarely or did not fill their teeth brushing schedule thoroughly.

## Conclusions

Based on the research, it can be concluded that there was a significant difference in the compliance with tooth brushing behavior in pregnant women before and after the use of the task force method.

Source of funding: none

Conflict of interest: none

Expressions of gratitude – Acknowledgments: University of Muhammadiyah Surakarta, Sangkrah Community Health Center.



## References

1. Jeihooni AK, Jamshidi H, Kashfi SM, Avand A, Khiyali Z. The effect of health education program based on health belief model on oral health behaviors in pregnant women of Fasa city, Fars province, south of Iran. Journal of International Society of Preventive & Community Dentistry. 2017 Nov;7(6):336.

2. Husain AM, Kadhem Q I, Husain Nibras Alaa. Prevalence of Anemia in a sample of pregnant women in Babylon Governorate, Iraq. Revista Latinoamericana de Hipertension. 2020 Oct; 15(4):275-278.

3. Hartnett E, Haber J, Krainovich-Miller B, Bella A, Vasilyeva A, Lange Kessler J. Oral Health in Pregnancy. Journal of Obstetric, Gynecologic & Neonatal Nursing.2016;45(4):565–573. https://doi.org/10.1016/j.jogn.2016.04.005

4. Ebrahimipour S, Ebrahimipoiur H, Alibakhshian F, Mohamadzadeh M. Effect of education based on the theory of planned behavior on adoption of oral health behaviors of pregnant women referred to health centers of Birjand in 2016. Journal of International Society of Preventive & Community Dentistry. 2016 Nov;6(6):584.

5. Gaszyńska E, Klepacz-Szewczyk J, Trafalska E, Garus-Pakowska A, Szatko F. Dental awareness and oral health of pregnant women in Poland. International journal of occupational medicine and environmental health. 2015 Apr 17;28(3):603-11.

6. Hidayati H, Kuswardani K, Rahayu G. Pengaruh kebersihan gigi dan mulut dengan status gingivitis pada ibu hamil di wilayah kerja Puskesmas Andalas Kecamatan Padang Timur Kota Padang tahun 2012. Majalah Kedokteran Andalas. 2012 Aug 30;36(2):215-24.

7. George A, Johnson M, Blinkhorn A, Ajwani S, Bhole S, Yeo AE, Ellis S. The oral health status, practices and knowledge of pregnant women in soutɳ western Sydney. Australian dental journal. 2013 Mar;58(1):26-33.

8. Warongan G, Wagey F, Mintjelungan CN. Gambaran status gingiva pada ibu hamil di puskesmas bahu manado. E-GIGI. 2014;3(1). https://doi.org/10.35790/eg.3.1.2015.6459.

9. Atei Mina, Badenosh Bita, Hashemmegad Maryam, Mirmajid Roghayye, Shirazi JR, Dolastad Fatemeh, Farahani Masoumeh. Preventing preterm birth in high-risk: pregant women : cerclage or pessary? A retrospective cohort study. AVTF Archivos Venezolanos de Farmacologia y Terapeutica. 2021 Oct: 40(2):133-136.

10. Diaz Cristobal IE, Zambrano Cindy LV, Espin Fransisco AD, Andino Santiago AV, Garcia Marco AA, Palomeque Nelson AP. Vitamin D : A preventive tool against the metabolic syndrome?. Sindrome Cardiometabolico y enfermedades cronica de generativas. 2019 Vol IX(1):23-28.

11. Diaz Cristobal IE, Diaz Liseth CA, Iza Sandra EH, Saez Elizabeth AQ, Casco Laura PV, Fiallos Karla JPF. Diabetes Mellitus and Neurocognitial decline; Clinical and Epidemiological Aspects. Diabetes Internacional y endrocrinologica. 2019 XI(1) :1-5.

12. Gani Soulissa A, Periodonsia D, Kedokteran Gigi Universitas Trisak Jalan Kyai Tapa No F. Hubungan kehamilan dan penyakit periodontal (Relationship between pregnancy and periodontal disease). Jurnal PDGI.2014;63(3):71–77.

13. Naseem M, Khurshid Z, Khan HA, Niazi F, Zohaib S, Zafar MS. Oral health challenges in pregnant women: Recommendations for dental care professionals. The Saudi Journal for Dental Research. 2016 Jul 1;7(2):138-46.

14. Notoatmodjo S. Promosi Kesehatan dan Perilaku Kesehatan. Jakarta: Rineka Cipta. 2014.

15. Bonds TM, Hura M, Young TD. Enhancing Army Joint Force Headquarters Capabilities. RAND ARROYO CENTER SANTA MONICA CA; 2010 Jan 1.

16. Moyer VA, US Preventive Services Task Force. Prevention of dental caries in children from birth through age 5 years: US Preventive Services Task Force recommendation statement. Pediatrics. 2014 Jun 1;133(6):1102-11.

17. Hayasaki H, Saitoh I, Nakakura-Ohshima K, Hanasaki M, Nogami Y, Nakajima T, Inada E, Iwasaki T, Iwase Y, Sawami T, Kawasaki K. Tooth brushing for oral prophylaxis. Japanese Dental Science Review. 2014 Aug 1;50(3):69-77.

18. Marcon M, Sarti A, Tubaro S. Toothbrush motion analysis to help children learn proper tooth brushing. Computer Vision and Image Understanding. 2016 Jul 1;148:34-45.

19. Noviani N. Faktor-faktor yang Berhubungan dengan Status Karies Gigi (DMF-T) Santri Pesantren Al- Ashariyyah Nurul Iman Parung Bogor. Universitas Indonesia Ilmu Kesehatan Masyarakat.2010:1–110.

20. Newman, M. G., Takei, H. H., & Carranza, F. A. (2010). Carranza's clinical periodontology (10th ed.). Philadelphia: W.B. Saunders Co.

21. Gamelia E, Sistiarani C, Masfiah S. Determinan perilaku perawatan kehamilan. Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal). 2013 Oct 1;8(3):133-8.