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Research article

Medical research

Correlations between oral hygiene status with gingival status of pregnant women in denpasar city health center 2018

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ABSTRACT

Pregnancy gingivitis is gingivitis that occurs in pregnant women. Gingivitis is caused by irritation of bacteria present in plaque and calculus. Plaque and calculus are indicators of poor oral hygiene. During pregnancy, the hormones estrogen and progesterone will increase which causes the gingival tissue to overreact to local irritants. This study aims to determine the relationship between the level of oral hygiene with the gingival status of pregnant women in the working area of Denpasar City Health Center in 2018.

This type of research is analytic correlation with cross-sectional approach, the sample is taken using accidental sampling technique with Chi-Square statistical test. Subjects were 275 pregnant women who visited the Health Center in Denpasar City where the number of Health Center is 11. Quantitative data analysis was done univariately in the form frequency and percentage, as well as bivariate analysis with cross-tabulation and correlation tests conducted by Kolmogorov Smirnov data normality turned out to be p-value gingival status and OHI-S = 0.00 which means less than 0.05 which indicates that the two variables are not normally distributed, then for the correlation test for abnormal data used the Kendal Tau test.

Data analysis: Chi-square test with 95% confidence intervals (CI) and $p > 0.5$). Data analysis test in this study used the Chi-Square Test (X2) with a significance level of 95% ($\alpha = 0.05$). The scale used in this study is the ordinal scale.

The results showed the level of oral hygiene of pregnant women in Denpasar City Health Center was mostly medium criteria 183 people (66.5%) and most of the pregnant women examined had gingivitis criteria mild gingivitis 234 people (85.1%), no some have severe gingivitis status. All pregnant women examined had gingivitis, both mothers with good levels of oral hygiene, while none were with poor criteria. It was also obtained the relationship between oral hygiene with gingival status $r = 0,386$ with $p = 0,000$ ($p < 0.05$). This means there is a moderate and positive relationship between oral hygiene (OHIS) and gingival disease (gingival status) in pregnant women who visit the Health Center working area of Denpasar City in 2018. It is recommended for pregnant women to always maintain the cleanliness and health of their oral cavity.

Keywords: Pregnancy gingivitis, Oral hygiene, Pregnant women

INTRODUCTION

Pregnancy is a very special and pleasant moment and stage for a woman. So maintaining the health of the body during pregnancy becomes an absolute thing for every pregnant woman to do (Anonymous, 2009, Fadavi et al, 2009) Public attention to women's health during pregnancy is increasing, but dental and oral health is often missed due to attention the assumption that pregnancy has nothing to do with the state of the oral cavity. Women often experience hormonal instability. causes an increase in the hormones estrogen and progesterone where both hormones can affect periodontal tissues such as gingival inflammation or gingivitis (Caranza FA. Newman MG, 2002) [22].

Gingivitis is a periodontal disorder that is often encountered when caused by plaque, namely the gingival edge will be clinically seen reddish to bluish red, enlarged gingival contours because of the adema and bleed easily when there are stimuli such as when eating and brushing teeth. Gingivitis can also be caused by systemic factors such as hormonal instability experienced by women during puberty, menstruation, and pregnancy. Gingivitis in pregnant women is called gingivitis gravidarum or pregnancy gingivitis.

The inflammatory response of pregnancy gingivitis becomes exaggerated with relatively little local irritation factor. Gingivitis depends on the level of oral hygiene of the patient as well as the role of the hormones estrogen and progesterone in periodontal tissue.

Pregnancy gingivitis or gingivitis gravidarum usually occurs in the 2nd and 3rd month of pregnancy, usually at the 8th week the severity of the peak is in the 8th month of pregnancy (week 32) decreases in the 9th month of pregnancy along with decreasing levels hormones in the body.2,6,8 Some studies state that the effect of hormonal changes will affect the dental health of pregnant women by 60% with 10-27% experiencing gum swelling. 9 Indonesian Dental Association notes gum inflammation is a problem of the mouth and teeth that often afflict pregnant women where 5-10% have swollen gums

In pregnancy, there is an increase in acid levels in the oral cavity, not to mention if pregnant

women experience nausea and vomiting which can result in exposure to stomach acid in the teeth and gums. This can cause inflammation / gum disease and teeth, which can ultimately affect pregnancy and fetal development. (Adhi, 2009). These changes can affect the system in the body which will also affect the physiology of body parts including the oral cavity such as pain in periodontal tissue and also affect the emergence of gingivitis. (Pirie M, et al, 2007) [34]. Most complaints in the oral cavity of pregnant women are caused by hormonal changes. (Gaffield M.L. et al, 2001; Jiang P. et al, 2008)

Dental and oral diseases that occur during pregnancy are not only influenced by the pregnancy itself but are also influenced by the behavior of pregnant women which includes knowledge, attitudes and actions to maintain oral health.

Research conducted on pregnant women in Turkey by Ozen et al. (2012) stated that although 75% of respondents had knowledge of the relationship between pregnancy and periodontal disease, only 13.7% visited a dentist during pregnancy.

In the study of Hajikazemi et al. (2008) [12] conducted on pregnant women found that only 5.6% of respondents had a high level of knowledge, 30% of respondents behaved well toward health and 34.4% of respondents had good dental and oral health behavior. The results of this study indicate that the low behavior that includes knowledge, attitudes and actions of pregnant women towards the maintenance of oral health. The study found that the increased risk of low birth weight infants and fetal growth restriction was seen to be less if the disruption in the teeth and gums was mild. The risk becomes significant if the tooth disease is more severe. (IDAI, 2007) (Wrzosek T and Einarson A. 2009).

In the February 2006 issue of the Journal of Periodontology, proving the benefits of oral and dental health care for pregnant women, namely reducing the risk of pre-eclampsia (pregnancy poisoning) by 5 -8%, then the results of Academy of General Dentistry research show that pregnant women suffer health problems mouth and teeth (periodontal disease) 3-5 times greater risk for delivering premature babies (less months). While

pregnant women who suffer from gum infections, are 6 times more likely to deliver premature babies and babies born with low weight. Journal of Periodontology January 2006 edition states that, healing therapy for oral and dental health problems suffered by pregnant women, can reduce the birth rate of premature babies and babies born with low weight by 68%. The need for teaching and training for mothers who will become pregnant to maintain oral health. (Lydon-Rochelle M.T. et al, 2004).

Research on the occurrence of gingivitis in pregnant women called Pregnancy gingivitis or inflammation of the gums conducted by Retnoningrum (2006), at Karyadi Hospital Semarang stated that pregnant women have a risk factor for babies born with low birth weight (BBRL), at 8.75 times compared to pregnant women who do not experience gingivitis. Oral mucosal lesions are more common in pregnant women than non-pregnant women. According to Jefoat research (in Ernawati 2008) produced that pregnant women who suffer from gingivitis, the risk of having premature babies with low birth weight (LBW) of 4.45-7.07 times higher than in mothers with healthy gingival conditions.

Maintenance of oral health will reduce the incidence of gingivitis during pregnancy. According to research conducted by Santoso et al. In 2009, periodontal diseases such as untreated gingivitis in pregnant women was one of the risk factors for a low birth weight (LBW) baby. The results of data analysis showed that respondents with poor oral hygiene had 2.55 times the risk of giving birth to LBW babies less months compared to respondents with good oral hygiene. Therefore dental care in pregnant women is very important. As a study conducted by Pujiastuti and Praharani (2005) where the results are an increase in the

severity of gingivitis during pregnancy which is worst in the third trimester.

Research conducted by Erawati, Anastasia and Sukmadara (2016), results in a significant correlation between the level of dental and oral hygiene in pregnant women and the severity of gingivitis in pregnant women in the third trimester compared to the third trimester significantly.

The Basic Health Research (Riskesdas, 2013) of the Bali Convention area stated that the prevalence of dental and oral health problems reached 25.1% mostly suffered by women and in the riskesdas it was also stated that an average of 32 women in the Bali area suffered from sores.

Puskesmas is one of the centers for public health services that provides curative, preventive, promotive and rehabilitative services. As a leading health care facility that provides services to pregnant women and oral health.

METHOD

This type of research is a clinical observational study using a cross sectional study method, when and where the study was conducted starting in July-August 2018 conducted at the Polygigi and Polyclinic MCH Puskesmas in the working area of the Denpasar City Puskesmas which includes 11 Puskesmas ie: Puskesmas I, II, III, IV South Denpasar, Health Center I, II West Denpasar, Health Center I, II East Denpasar, Health Center I, II, III North Denpasar.

The population in this study were all pregnant women who came for their pregnancy check up at the Puskesmas in the working area of Denpasar City Health Office with samples of pregnant women who met the inclusion criteria and were found when the study took place at the KIA polyclinic for 810 people in 2018 services. Based on preliminary data through interviews with dentists and dental nurses who work at each Puskesmas, it is stated that approximately 50 people with gingivitis each recorded 17 cases in pregnant women and not all pregnant women would check their teeth at the existing dental clinic. in the Puskesmas and there has never been any research on the relationship between oral hygiene of pregnant women and the incidence of gingivitis that occurs in pregnant

RESULTS AND DISCUSSION

General description

In the working area of Denpasar, which consists of 11 Puskesmas located in 4 sub-districts in Denpasar, namely Puskesmas I, II, III, IV South Denpasar, Puskesmas I, II, East Denpasar, Puskesmas I, II Denpasar Barat, Puskesmas I, II, III North Denpasar which provides dental health

women visiting the Puskesmas in the working area of the Denpasar City Health Office

RESULT

Characteristic Responden

Distribution of respondents based on age during pregnancy is in the age range of 16 -43 years and seen a lot in the age range of 21-25 years by 87 people (31.64%) and the age range of 26-30 years as many as 79 people (28.73 and most a little at the age of 41-45 years is 4 people (1.45%). This is in accordance with the opinion of Airlangga regarding Fertile Age Women and healthy reproductive period, age 20-29 years is the peak of fertility which has a 95% chance of pregnancy occurring. When women are around 30 years old the percentage for causing pregnancy decreases by 90%. Whereas at the age of 40 years the chance for pregnancy decreases to 40%. Meanwhile, after approaching the age of 50 years, women only have a chance of getting pregnant with a percentage of 10%. Age 20-30 years is a healthy reproductive age which is known to be a safe age for pregnancy and childbirth (Prawirohardjo, 2012). Likewise, mothers who are more than 35 years old are at high risk for childbirth, such as babies born with asphyxia, preeclampsia, and hypertension that can cause bleeding and childbirth too early (Kristiyanasari, 2010). This age is also in accordance with the 2010 National Socio-Economic Survey (Susenas) data.

Distribution of respondent characteristics based on gestational age most with trimester II gestational age is 119 people (43.3%), followed by respondents with trimester 3 gestational age as many as 106 people (38.5%) and at least trimester 1 as many as 50 people (18.2 %). This is in accordance with the results of research from Trisnayati T (2014) with the title of the status of periodontitis in pregnant women in the working area of Rappang Public Health Center, Sidrap Regency, where 80% of 40 are in the second trimester of pregnancy.

The frequency distribution of respondents based on the highest number of pregnancies (parity) in the first pregnancy (primigravida) was 117 people (42.5%), followed by the second

pregnancy 94 people (34.2%). The least number of respondents who were pregnant to the 6th. this is due to the age of pregnant women who visit the health center as the productive age group is in the age group of 20-30 years which is the initial period of marriage so that it has only experienced the first pregnancy and also means that there is no experience in knowledge about pregnancy so that most pregnant women experience gingivitis even though it is still a degree light. shows that the majority of respondents in this study experienced the first and second gravidas. Only a small proportion of respondents, 10%, experienced gravida 3. This condition is likely caused because most respondents in this study were in the age group of 20-35 years. Usually in the age range of 20-35 years is the initial period of marriage so that generally only experiencing the first and second pregnancy.

The frequency distribution of respondents was based on the most educators having high school / equivalent education of 153 people (55.64%) while at least with tertiary education. This is a sign that the respondent understands the importance of pregnancy, which is a productive period for pregnancy and childbirth. According to the authors, this shows that the majority of respondents in this study already have an awareness of the importance of continuing education. Education has an important role in improving living standards. Generally the level of welfare is very dependent on the level of one's education. Besides education is closely related to knowledge so that it will affect one's behavior including in the utilization of health services. This is in accordance with scientific opinion that is a tiered education system is expected to be able to increase individual knowledge through a certain mindset (Gunarsa, 2001). The higher a person's education, the easier it is to receive information so the more knowledge he has.

Distribution of the frequency of respondents by type of work most of the respondents works status 139 (50.5%), both as entrepreneurs, civil servants while the remaining 136 people (49.5%) as housewives. This means that by working, mothers can socialize with others and can get information and experience from the environment so that they have more knowledge than mothers who do not

work. Even though the majority of respondents in this study had the latest tertiary education and high school, respondents who already had good knowledge of dental and oral health care, because by working they got a lot of information both formally and informally through print and electronic media. This might be due to the

respondents' awareness about the importance of maintaining oral health, especially during pregnancy. Information obtained by pregnant women regarding the maintenance of dental and oral health will also affect the level of knowledge that can support behaviors in everyday life.

RESULT

Univariate data analysis

Distribution of Respondents by Oral Hygiene Index-Simplified (OHI-S)

Table 1. Frequency Distribution of Respondents by Oral Hygiene Index-Simplified (OHI-S).

No	OHI-S Criteria	Frequency (f)	Percentage (%)
1	Good	75	27.3
2	Poor	17	6.2
3	Fair	183	66.5
Total		275	100.0

Table 1. Frequency distribution based on the level of oral hygiene (OHI-S) is mostly in the medium criteria of 183 people (66.5%), 75 good criteria and 17 people (6.2%) poor criteria during pregnancy. These results are in accordance with the study of Ditta, et al (2011) with the title of the relationship between pregnancy behavior of pregnant women with sympleyfeidd oral hygiene index in 2011 of 50 people, 66% of the criteria being, according to the research of Hidayati et al

(2012), regarding the effect of dental hygiene and mouth with sataus gingivitis for pregnant women in the working area of Andalas Public Health Center, Padang Timur District, Padang City, where most of the mothers had a moderate level of dental and oral hygiene, namely 57.1%. Only a small proportion of mothers, 2.9%, have poor oral hygiene. The remaining 40% have a good level of dental and oral hygiene from 70 respondents.

Frequency Distribution of Respondents Based on Gingival Status

Table 2. Distribution of Respondent Frequencies Based on Gingival Status

No	Gingival Status	Frequency (f)	Percentage (%)
1	Health	21	7.6
2	Mild Gingivitis	234	85.1
3	Moderate Gingivitis	20	7.3
4	Sever Gingivitis	0	0,0
Total		275	100.0

Table 2. It is known that most pregnant women experience gingival status with mild gingivitis criteria 234 people (85.1%) and the remaining 21 (7.6%) healthy and moderate gingiva 20 respondents (7.3%) and none have experienced severe gingivitis status. This is consistent with the

results of Riskesdas (2007) which states, one of the populations that are vulnerable to periodontal disease is the population of pregnant women. Women who are pregnant, clinically often found an inflammatory change in the gingiva. This inflammation is found in 30% - 100% of pregnant

women called pregnancy gingivitis. Gingivitis generally occurs in the second trimester of pregnancy and progressively increases with increasing gestational age. Pregnancy gingivitis is caused by an increase in the concentration of female hormones namely estrogen and progesterone in the blood. The presence of hormonal changes accompanied by vascular changes causes the gingiva to be sensitive especially to other toxins and irritants, such as plaque and calculus which cause inflamed gingiva. This condition is characterized by an interdental papilla that is red, swollen, bleeds easily and is accompanied by pain.

Where gingivitis generally occurs in the range of 30% -100% of pregnant women from mild to severe gingival status. In this pregnancy condition the gingiva correlates with an increase in sex steroid hormones and will decrease after giving birth

The results of this study are also in accordance with research by Hidayati et al (2012), regarding the effect of dental and oral hygiene with the status of gingivitis of pregnant women in the working

area of the Andalas Public Health Center, Padang Timur District, Padang, Hidayati et al. 70%. %). A total of 18.6% had severe gingivitis and the remaining 11.4% had mild gingivitis.

Indonesian Dentists Association (PDGI) quoted from Hartati et al (2011) also noted gum inflammation is a dental and mouth problem that is often found in pregnant women where 5% - 10% of them experience gum swelling. Research conducted by Retroningrum (2006) states that gingivitis and nutritional status in pregnant women are significantly related and are a risk factor for low birth weight babies (LBW). This was confirmed by Republika Newsroom in 2009, quoted from Hartati et al (2011) published about the 2002 National Health Survey which said that 77% of pregnant women who suffer from gum inflammation give birth prematurely.

DATA ANALYSIS BIVARIATE

Frequency Distribution of Respondents Based on the Relationship of Oral Hygiene Level (OHI-S) with Gingival Status

Table 3Frequency Distribution of Respondents Based on the Relationship of Oral Hygiene Level (OHI-S) with Gingival Status

OHI-S Criteria	Gingival Status						Total	
	Normal		Mild Gingivitis		Moderate Gingivitis			
	F	%	F	%	F	%	F	%
Good	14	18,7	61	81,3	0	0,0	75	100,0
Fair	7	3,8	169	92,3	7	3,8	183	100,0
Poor	0	0,0	4	23,5	14	76,5	17	100,0
Total	21	7.6	234	85,1	21	7,3	275	100,0

In table 3 respondents based on moderate OHI-S criteria, most experienced mild gingivitis 169 (92.3%), while OHI-S both mostly experienced mild gingivitis and normal gingiva. Whereas with poor OHI-S, most experienced moderate criteria gingivitis. Relationship of Oral Hygiene Level (OHI-S) with Gingival Status with chi-Square test results obtained $p = 0,000$ less than significant level $\alpha = 0.05$, so it can be concluded that there is a significant relationship between the level of oral hygiene (OHI-S) with status gingiva during pregnancy. This research shows that there is a

relationship between the level of oral hygiene with gingival status where although the respondents have a good oral hygiene status, they still experience gingival disorders even in mild criteria. This condition is caused during pregnancy when hormonal changes occur, the hormones estrogen and progesterone. These hormonal changes in pregnant women can cause a variety of complaints to pregnant women such as nausea, vomiting, and toothache so that pregnant women ignore oral and dental hygiene. This study is in accordance with the opinion of Prawirohardjo

(2010) in which pregnant women occur physiological changes wherein a number of hormones have increased such as estrogen and progesterone levels have an impact on the entire body including the oral cavity so also in the saliva of pregnant women during pregnancy. The results of this study are in line with the results of research conducted by Wardhani in 2012 [43] showing a relationship between the level of oral hygiene of a pregnant woman with her gingival status ie the worse the level of oral hygiene of a pregnant woman, the worse her gingival status will be. From the research that has been done this shows that the oral hygiene status of pregnant women will affect the severity of gingivitis. Although the severity of gingivitis is influenced by oral hygiene conditions, the increase in the severity of gingivitis that occurs in pregnant women is influenced by hormonal factors. This is because the increase in hormones in pregnant women peaks in the third trimester of pregnancy. Research conducted by Wardhani (2012) [43] shows a relationship between the level of oral hygiene of pregnant women with their

gingival status, the worse the oral hygiene level of pregnant women, the worse their gingival status is. This is supported by research conducted by Hartati et al (2011) [10] who found that pregnant women with plaque on their teeth had more gingivitis compared to women with no plaque on their teeth. Research conducted by Rintoko (2005) [36] also stated the level of oral hygiene affected the occurrence of gingivitis in pregnant mother.

The severity of gingivitis peaks at 8 months gestation and decreases at 9 months gestation, with the same pattern of plaque accumulation. Some researchers report the greatest severity of gingivitis occurs in the second and third trimesters. Reduction in the severity of gingivitis can occur after 2 months postpartum and after one year the condition of the gingiva can return to normal, can be compared with the condition of women who are not pregnant. However, gingiva will not return to normal if local factors are not removed.

Frequency Distribution of Respondents Based on Relationship between Gingival Status and Pregnancy Trimester.

Table 4. Distribution of Respondent Frequencies Based on the Relationship between Gingival Status and Pregnancy Trimester

Pregnancy Trimester	Gingival Status						Total	
	Normal		Mild Gingivitis		Moderate Gingivitis			
	F	%	F	%	F	%	F	%
Trimester I	5	10,0	44	88,0	1	2,0	50	100,0
Trimester II	6	5,0	104	87,4	9	7,6	11. 9	100,0
Trimester III	10	9,4	86	81,1	10	9,4	106	100,0
Total	21	7,6	234	85.1	20	7,3	275	100,0

Table 4 In trimester 1, II, III, most of them experienced mild inflammation, namely (88.0%) and 87.4% and 86%. There was a significant relationship between gingival status and gestational age because of the chi-square test, the significance value = 0.002 < of $\alpha = 0.05$, bivariate analysis between gestational age with gingival health status, obtained the most gingival status results in mild gingivitis status both in trimester I (88.0%), in trimester II mild gingivitis status (87.4%), as well as in the third trimester, mild gingivitis status (81.1%). In this study, there was no status of severe gingivitis which showed that

gingivitis was different in all samples even though the degree of oral hygiene (OHI-S) was good. These results are in accordance with the theory which states that pregnancy can trigger gingivitis even though the respondent's oral cavity is good (Carranza, 2002) [23].

In this study the results obtained in the level of oral hygiene of pregnant women mostly experienced gingival status with mild gingivitis criteria both in respondents with OHI-S criteria both experienced gingival inflammation with mild criteria as much (81.3%), and the most respondents with OHI-S status is experiencing

mild gingivitis (92.3%). The remaining minority of respondents with good, moderate and bad OHI-S status have moderate gingivitis. This research shows that there is a relationship between the level of oral hygiene with gingival status where although the respondents have a good oral hygiene status, they still experience gingival disorders even in mild criteria. This condition is caused during pregnancy when hormonal changes occur, the hormones estrogen and progesterone. These hormonal changes in pregnant women can cause a variety of complaints to pregnant women such as nausea, vomiting, and toothache so that pregnant women ignore oral and dental hygiene. This study is in accordance with the opinion of Prawirohardjo (2010) [33] in which pregnant women occur physiological changes wherein a number of hormones have increased such as estrogen and progesterone levels have an impact on the entire body including the oral cavity so also in the saliva of pregnant women during pregnancy. The study is also in accordance with the results of Riskesdas 2007 which stated that the Indonesian population experienced dental and oral health problems namely caries and periodontal diseases such as gingivitis including pregnant women (MOH RI. 2007) The results of this study are in line with the results of research conducted by Wardhani in 2012 [43] showing the existence of the relationship between the level of oral hygiene of pregnant women with its gingival status is the worse the level of oral hygiene of pregnant women, the worse the status of the gingiva. From the research that has been done this shows that the oral hygiene status of pregnant women will affect the severity of gingivitis. Although the severity of gingivitis is influenced by oral hygiene conditions, the increase in the severity of gingivitis that occurs in pregnant women is influenced by hormonal factors. This is because the increase in hormones in pregnant

women peaks in the third trimester of pregnancy. This is in accordance with the results of research from Dika Fitria W (2014) [43] with the title of the relationship between the level of oral hygiene with gingival status in pregnant women in the working area of Sumber Sari Health Center, Summersari District of Jember based on the results of the Pearson correlation test, the significance value is 0.002; The significance values obtained were all below 0.05 ($p < 0.05$), so it can be concluded that in all trimesters there was a significant relationship between the level of oral hygiene and gingival status in pregnant women. Research conducted by Wardhani (2012) [43] shows a relationship between the level of oral hygiene of pregnant women with their gingival status, the worse the oral hygiene level of pregnant women, the worse their gingival status is. This is supported by research conducted by Hartati et al (2011) who found that pregnant women with plaque on their teeth had more gingivitis compared to women with no plaque on their teeth. Research conducted by Rintoko (2005) [36] also stated the level of oral hygiene affected the occurrence of gingivitis in pregnant mother. The severity of gingivitis peaks at 8 months gestation and decreases at 9 months gestation, with the same pattern of plaque accumulation. Some researchers report the greatest severity of gingivitis occurs in the second and third trimesters. Reduction in the severity of gingivitis can occur after 2 months postpartum and after one year the condition of the gingiva can return to normal, can be compared with the condition of women who are not pregnant. However, gingiva will not return to normal if local factors are not removed.

Frequency Distribution of Respondents Based on the Relationship between Gingival Status and Education

Table 5. Distribution of Respondent Frequencies Based on the Relationship between Gingival Status and Education

Education	Gingivitis						Total	
	Normal		Mild Gingivitis		Moderate Gingivitis			
	N	%	N	%	N	%	N	%
Primary	2	6,3	28	87,5	2	6,3	32	100,0
Junior school	2	38,0	47	88,7	4	7,5	53	100,0

High school	15	9,8	127	83,0	11	7,2	153	100,0
Diplome	2	14,3	9	64,3	3	21,4	14	100,0
Bachelor	0	0	23		0	0,0	23	100,0
Total	21	7,6	234	85,0	27	9,8	275	100,0

In table 5, where the majority of respondents who were educated in high school or junior high school experienced mild gingivitis which was 83.0% and 87.5% and none had severe gingivitis. Chi-square statistical test $p = 0.000$ means the significance value = 0.000 is smaller than the significant level $\alpha = 0.05$, so it can be concluded that there is a significant relationship between education level and gingival status during pregnancy. Meaning the results of this study indicate that there is a relationship between status gingiva and education level in pregnant women in the working area of Denpasar City Health Center because the significance value is smaller 0.05, it can be seen that the significance value of the Chi Square test. Based on the overall results of research on the relationship between the status of periodontal disease and the level of education in pregnant women in the Work Area of Welahan Health Center in Jepara Regency, by Danny Setiawan Nugraha (2017) there is a relationship between the level of education and status of periodontal disease in pregnant women in the Work Area of the Welahan District Health Center. Jepara This can be proven by the results of the Chi-Square test (significance value 0.039) which shows the close relationship between the level of education with periodontal status in pregnant women. Education influences knowledge, while knowledge will have an impact on behavior and understanding of the health of teeth and mouth, and indirectly have an impact on the health of periodontal disease. The results of this study are in line with research conducted by Sunita Bamanikar

and Liew Kok Kee (2013), with the title Knowledge, Attitude and Practice of Oral and Dental Healthcare in Pregnant Women. The results of the study stated that there was a relationship between education level and periodontal status in pregnant women in various trimesters. From the research results, pregnant women in the first trimester were found as many as 26.9% of the samples had normal (healthy) periodontitis status, while in the second trimester it was found as many as 31.2% of the samples had mild periodontitis status, and in pregnant women in the third trimester found as many as 40.9% of the sample had moderate periodontal status. From the sample it was also found that from a sample of 40.9% who had moderate periodontal status, most of them had quite a low education. Periodontal disease is an inflammatory disease or damage to the supporting tissues of the teeth caused by local factors, namely bacterial plaque. who do not yet know about the importance of maintaining dental health during the pregnancy period due to the rush of working mothers so they do not have time to visit the dental clinic and are only busy examining pregnancy, also preparing for the birth of their babies so that they neglect care of the oral cavity. Likewise, even though most of the respondents work, but because most of them have a high school education or equivalent so their income is only to meet routine needs so that ignoring dental care is considered expensive and does not become a major priority.

Frequency Distribution of Respondents Based on the Relationship between the level of dental and oral hygiene (OHI-S) with gestational age

Table 6. Distribution of Respondent Frequencies Based on the Relationship between the level of dental and oral hygiene with gestational age

OHI-S Criteria	Gestational age						Total	
	Trimester I		Trimester II		Trimester III		F	%
	F	%	F	%	F	%		
Good	14	18,7	61	81,3	0	0,0	75	100,0
Fair	36	3,8	169	93,3	7	3,8	183	100,0
Poor	0	0,0	0	0,0	17	100,0	17	100,0
Total	50	18,2	119	43,3	106	38,5	275	100,0

Table 6 based on the relationship between OHIS and gestational age, most in the second and third trimesters have OHI-S with moderate criteria. Based on statistical tests by means of chi-square, the results are $p = 0,000$ which means the

Frequency Distribution of Respondents Based on the Relationship between the level of dental and oral hygiene with Gingival Status

significance value = 0,000 is less than the significant level $\alpha = 0.05$, so it can be concluded that there is a significant relationship between OHI-S and trimester of pregnancy

Table 7. Frequency Distribution of Respondents Based on the Relationship between the level of dental and oral hygiene with Gingival Status

OHI-S Criteria	Gingival Criteria						Total	
	Normal		Mild Gingivitis		Moderate Gingivitis			
	N	%	N	%	N	%	N	%
Good		18,7	61	81,3	0	0,0	75	100,0
Fair	14 7	3,8	169	93,3	7	3,8	183	100,0
Poor	0	0,0	4	23,5	13	76,5	17	100,0
Total	21	7.6%	234	85,1	20	7,6	275	100,0

Table 7 shows the majority of respondents with moderate OHI-S with gingival status with mild gingivitis criteria. There is a significant relationship between OHI-S with gingival status

during pregnancy, based on chi-square results obtained $p = 0,000$, which means the significance value = 0,000 is less than the significant level $\alpha = 0.05$,

Frequency Distribution of Respondents Based on the Relationship between Gingival Status and Employment

Table 8. Distribution of Respondent Frequencies Based on Relationship of Gingival Status with Work

Job	Gingival Criteria						Total	
	Normal		Mild Gingivitis		Moderate Gingivitis			
	F	%	F	%	F	%	F	%
Work	8	5.8	118	84,9	13	9,4	139	100,0
Not work		9,6	116	85,3	7	5.1	136	100,0
	13							
Total	22	8.0	233	84,7	20	7,3	275	100,0

Table 8, most respondents both working and not working experience gingivitis with mild criteria. Based on the Chi Square statistical test obtained $p = 0.002$, which means that the significance value = 0.000 is less than the significant level $\alpha = 0.05$, so it can be concluded that there is a significant relationship between gingival status. respondents who already have good knowledge about oral health care, because by working they get a lot of information both formally and informally through print and electronic media. This might be due to the

respondents' awareness about the importance of maintaining oral health, especially during pregnancy. Information obtained by pregnant women regarding the maintenance of oral health will also affect the level of knowledge.

DISCUSSION

Most respondents have high school / equivalent education, namely 153 people, 53 people junior high school (19.3%), 32 elementary school students while academy 14 people (5.1%) and only 23

people (8.4%) scholars. This is a sign that the respondent understands the importance of pregnancy, which is a productive period for pregnancy and childbirth. According to the authors, this shows that the majority of respondents in this study already have an awareness of the importance of continuing education. Education has an important role in improving living standards. Generally the level of welfare is very dependent on the level of one's education. Besides education is closely related to knowledge so that it will affect one's behavior including in the utilization of health services. This is in accordance with scientific opinion that is a tiered education system is expected to be able to increase individual knowledge through a certain mindset (Gunarsa, 2001). The higher a person's education, the easier it is to receive information so the more knowledge he has. Conversely, a lack of education will be more difficult in perceiving and inhibiting the development of maternal attitudes towards newly introduced values, such as the importance of ANC visits during pregnancy. Appropriate management by counseling so that mothers are more understanding about the importance of ANC in pregnant women, especially in the third trimester so that they can change their behavior to conduct ANC regularly (Nursalam and Siti Parian; 2001) [30]

This result is also in accordance with the study of Hendroyoto et al (2013) where most of the respondents had a high school education of 33 people (60%), out of 55 people who examined gingivitis in pregnant women at the Tumiting Menado Health Center

Frequency distribution of respondents by type of work most of the respondents work status 139 (50.5%) both as entrepreneurs, civil servants while the remaining 136 people (49.5%) as housewives. This means that by working, mothers can socialize with others and can get information and experience from the environment so that they have more knowledge than mothers who do not work. Even though the majority of respondents in this study had the latest tertiary education and high school, respondents who already had good knowledge of dental and oral health care, because by working they got a lot of information both formally and informally through print and electronic media. This might be due to the respondents' awareness about the importance of maintaining oral health,

especially during pregnancy. Information obtained by pregnant women regarding the maintenance of oral health will also affect the level of knowledge.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Characteristics of respondents by age during pregnancy are in the age range of 16 -43 years and seen a lot in the age range of 21 -25 years by 87 people (31.64%), most with the second trimester of pregnancy is 119 people (43.3%). The highest number of pregnancies (parity) in the first pregnancy (primigravida) was 117 people (42.5%), based on the most education with high school education / equivalent of 153 people (55.64%) while the least was with tertiary level education and most respondents were of the status worked 139 (50.5%), both as entrepreneurs, civil servants while the remaining 136 people (49.5%) were housewives. Based on the level of cleaning teeth and mouth (OHI-S), most are in the criteria of being 183 people (66.5%) with Gingival Status, mostly mild gingivitis criteria, 234 people (85.1%), none had severe gingivitis status. Correlation between level of oral hygiene (OHI-S) with Gingival Status with chi-Square test results obtained $p = 0,000$ less than significant level $\alpha = 0.05$, so it can be concluded that there is a significant relationship between the level of oral hygiene (OHI-S) with status gingiva during pregnancy. There is also a significant relationship between OHI-S and pregnancy trimester. There is a significant relationship between education level and gingival status during pregnancy. There is a significant relationship between OHI-S and trimester of pregnancy and there is a significant relationship between OHI-S and gingival status.

There is a significant relationship between gingival status and trimester of pregnancy (gestational age) and there is a significant relationship between gingival status and trimester of pregnancy (gestational age) with significance value = 0.002 less than significant level $\alpha = 0.05$, normality test results due to non-parametric correlation test Kendall Tau showed that the relationship between oral hygiene with gingival status was $r = 0,386$ with $p = 0,000$ ($p < 0.05$). The data shows a positive direction (positive r value) which means that the higher the OHIS, the higher the gingival index, and vice versa). The conclusion

is that there is a moderate and positive relationship between oral hygiene (OHIS) and gingival disease (gingival status) and moderate strength.

Suggestion

It is hoped that people will pay more attention and maintain their attitude and add insight into oral health Participation of health workers to further promote oral health during pregnancy and research with a wider population of other factors that affect the gingival status of pregnant women in addition to oral hygiene.

For pregnant women should continue to maintain adequate oral hygiene in order to prevent the occurrence of gingival disease and the worsening of the disease during pregnancy. So that the preparation process before pregnancy can be prepared carefully and planned. For fertile women, it is better before marriage to do a number of examinations, especially dental and mouth examinations. It aims to find out what risks must be prepared if pregnancy planning will be done later. So that the dangerous risks that can arise during pregnancy can be minimized.

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