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**THE RELATIONSHIP BETWEEN THE LEVEL OF KNOWLEDGE,  
ATTITUDES, AND ACTIONS WITH THE BEHAVIOR OF CHECKING THE  
DENTAL AND ORAL HEALTH OF PREGNANT WOMEN**

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**ABSTRACT**

**Background:** The number of dental and oral health the Indonesian is 57.6%, which is dominated by women (58.5%), especially women of productive age. During pregnancy, there are physical changes, hormonal changes, and behavioral changes, resulting in the changes for the maintenance of dental and oral hygiene. It becomes worse due to an increase in the estrogen and progesterone hormones. **Purpose:** To analyze the relationship between the level of knowledge, attitudes, and actions with the behavior of checking the dental and oral health of pregnant women. **Methods:** This study used an analytical observation with a cross-sectional research design. The samples of the study were calculated using the sample size correlation formula. The population in this study were all pregnant women from December 2020 to May 2021, at the Tana Lili Health Center, North Luwu Regency and the samples used were 34 respondents. **Results:** 70% of pregnant women have a sufficient level of knowledge, 79% of pregnant women have a quite good attitude, 68% of pregnant women have bad actions, and 85% of pregnant women have less behavior. The Spearman correlation test showed a significant relationship between the level of knowledge and the behavior of checking the oral health of pregnant women ( $p = 0.003$ ), and the strength of the correlation was moderate ( $r = 0.447$ ). There was a significant relationship between attitudes and behavior of checking the dental and oral health of pregnant women ( $p = 0.023$ ), and the strength of the correlation was low ( $r = 0.390$ ). The significance value for the relationship between action and behavior was ( $p = 0.009$ ) meaning that there was a significant relationship between the action and the behavior of checking the dental and oral health of pregnant women with a value ( $r = 0.439$ ) meaning that the correlation strength was moderate. **Conclusion:** There is a significant relationship between the level of knowledge, attitudes, and actions and the behavior of checking the dental and oral health of pregnant women.

**Keywords:** Action, Attitude, Behavior of checking the dental and oral health, Knowledge

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**INTRODUCTION**

Basic Health Research Data in 2018 recorded that the number of dental and oral health of the Indonesian people was 57.6%, which was dominated by women of 58.5%, especially women in productive age of 51.9% for the age group of 25-34 years old and 56.6% for the age group of 2013, which was only 25.9%. Dental and oral health problems in South Sulawesi Province are the second-highest in Indonesia at 68.9%. Data of Basic Health Research in South Sulawesi recorded that North Luwu Regency has a high percentage of

dental and oral health problems, which is recorded 5th with a percentage of 73.41%. Most of the dental and oral health problems occur in women of reproductive age.<sup>1,2</sup>

Pregnancy is a unique period for women because of various changes such as physical, hormonal, and behavioral changes. During pregnancy, maintenance of dental and oral health changes for the worse due to increased estrogen and progesterone hormones. This causes the condition of the oral cavity of pregnant women to become worse so that during pregnancy, the expectant mother experiences many complaints on

her teeth and mouth. Dental and oral problems that arise during pregnancy include hypersalivation (excess saliva), gingivitis, and cavities. This situation will have an impact on the growth and development of the fetus.<sup>3</sup> According to Gejir's research in 2017, the dental and oral health of pregnant women affects the condition of the baby. If a pregnant woman has a periodontal infection, she will be at risk for giving birth to a baby with low birth weight (LBW) and having a premature birth.<sup>4</sup>

Their knowledge influences dental and oral health problems in pregnant women. Lack of knowledge about dental and oral health as well as ignorance about the dangers of dental and oral diseases caused by low levels of education will cause people not to make good use of the dental health services that are already available so that it will add to the contribution to the inferior dental and oral health status of people.<sup>1</sup> There are two main factors affecting the health of a person or society. The behavior itself is determined by three factors: the first predisposing factor consisting of knowledge, attitudes, values, beliefs, behavior, and socio-economics that underlie behavior change. Second, the supporting elements that are manifested in the physical environment, including the availability of health facilities. The third is the driving factor manifested in the attitudes and behavior of health workers or other officials, family, teachers, friends, and so on, which are reference groups for community behavior.<sup>5</sup>

The formation of the behavior of pregnant women is influenced by knowledge and attitudes during pregnancy; pregnant women have poor attitudes in dental and oral health behavior during pregnancy, such as not brushing teeth regularly, rinsing with water after vomiting, consuming foods containing vitamins A and C and consuming fruits. The average score for the behavior of pregnant women in South Sulawesi on dental and oral health is in the poor category; for the behavior of visiting the dentist during pregnancy, only 13.3% of those who visit or check-up to the dentist.<sup>6</sup> Most pregnant women are ignorant of dental and oral health because they only focus on their pregnancy.<sup>7</sup> Pregnant women do not complain to their obstetrician if the dental and oral problems experienced have not been perceived as a disturbance. Mothers-to-be tend to be more worried about the health of their fetuses, thus ignoring dental and oral health problems.<sup>4</sup> Based on the above, it is necessary to study the relationship between the level of knowledge, attitudes, and actions and the behavior of checking the dental and oral health of pregnant women at the Tana Lili Health Center, North Luwu Regency in 2021.

## MATERIALS AND METHODS

The study used an analytic observational method with a cross-sectional design. This research was conducted at the Puskesmas (Public Health Center) Tana Lili, Luwu Utara Regency, South Sulawesi Province, from May to June 2021. The study population was all pregnant women from December 2020 to May 2021; the sample size was determined using the correlation formula, 34 pregnant women. Sampling was done by simple random sampling technique and determined based on inclusion and exclusion criteria. The inclusion criteria in this study were cooperative pregnant women aged 20-35 years and healthy pregnant women. The exclusion criteria for this study were pregnant women whose questionnaires were incomplete and unwilling to continue the study.

The research was conducted by reading the questionnaire to the respondents; the questionnaire was read and filled out by the researcher in order to minimize contact between the researcher and the respondents. The questionnaire consists of four items: knowledge questionnaire, attitude questionnaire, action questionnaire, and behavior questionnaire. The results of the questionnaire were analyzed using univariate and bivariate analysis using the Spearman correlation test.

## RESULTS

This study was conducted on 34 pregnant women as respondents using a simple random sampling technique.

**Table 1.** Overview of Research Respondents by Age

Age	Frequency (n)	Percentage (%)
<20	0	0%
20-30	23	67,7%
>30	11	32,3%
<b>Total</b>	<b>34</b>	<b>100%</b>

Based on table 1, most of the respondents were 20-30 years old, with a percentage of 67.7% (23 respondents).

**Table 2.** Overview of Research Respondents Based on Gestational Age

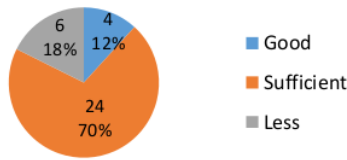
Gestational Age	Frequency (n)	Percentage (%)
Trimester 1	8	23,5%
Trimester 2	15	44,1%
Trimester 3	11	32,4%
<b>Total</b>	<b>34</b>	<b>100%</b>

It is known from table 2 that most of the respondents were in the second trimester, with a percentage of 44.1% (15 respondents).

**Table 3.** Overview of Research Respondents by Number of Pregnancy

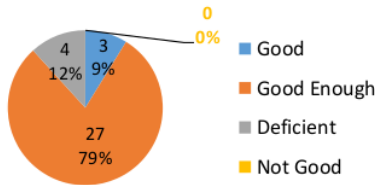
Number of Pregnancy	Frequency (n)	Percentage (%)
Primigravida	14	41,2%
Multigravida	20	58,8%
<b>Total</b>	<b>34</b>	<b>100%</b>

In table 3 above, most of the respondents were multigravida with a percentage of 58.8% (20 respondents).



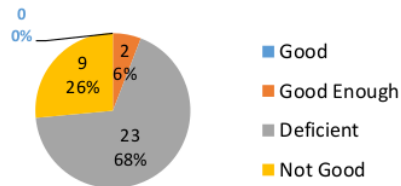
**Figure 1.** Diagram of Knowledge Level of Pregnant Women

Based on figure 1, the results show that the "sufficient" category has the highest frequency of 24 respondents (70%).



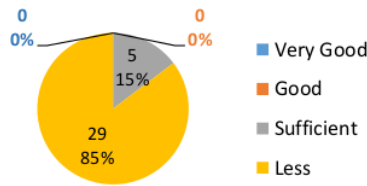
**Figure 2.** Diagram of the Attitude of Pregnant Women

From figure 2 above, the results show that the "Good Enough" category has the highest frequency of 27 people (79%).



**Figure 3.** Diagram of the Actions of Pregnant Women

It can be seen from Figure 3 that the "Deficient" category has the highest frequency of 23 people (68%).



**Figure 4.** Diagram of Dental and Oral Health Checking Behavior for Pregnant Women

According to figure 4 above, it is found that the "less" category has the highest frequency of 29 respondents (85%).

**Table 4.** Bivariate Data Analysis with Spearman Correlation Test

Data Analysis	Spearman Correlation Test	
	Significance	Correlation Coefficient
The level of knowledge to the behavior of checking the dental and oral health of pregnant women	.003	.497**
Attitudes to the behavior of checking the dental and oral health of pregnant women	.023	.390**
Actions to the behavior of checking the dental and oral health of pregnant women	.009	.439**

\* < 0,05

Seen from table 4 above, the significant value for the level of knowledge to the behavior of checking dental and oral health of pregnant women was 0.003 with a correlation coefficient of 0.497, which was a moderate correlation strength with a positive correlation direction. Attitudes to the behavior of checking the dental and oral health of pregnant women show a positive correlation direction, a significance value of 0.023 with a correlation coefficient of 0.390, which is a low correlation strength. Actions to the behavior of checking the dental and oral health of pregnant

women obtained a sig value of 0.009 with a moderate correlation strength, a correlation coefficient of 0.439, with a positive correlation direction. Each significant value obtained  $<0.05$  which meant that there is a significant relationship between the level of knowledge, attitudes, and actions and the behavior of checking dental and oral health of pregnant women at the Tana Lili Public Health Center, North Luwu Regency.

## DISCUSSION

The results of the study conducted at the Tana Lili Public Health Center, Luwu Utara Regency showed that the highest level of knowledge of pregnant women was in the sufficient category, which was 24 pregnant women (70%). This study is in line with the research of Abdat and Ismail (2019) which said that most of the dental and oral health knowledge of pregnant women is in the medium category with a percentage of 67.7% (21 people).<sup>8</sup> This study is also in line with a study conducted by Kabe et al. (2020), which stated that the knowledge of pregnant women in Allakuang village, Sidenreng Rappang Regency, South Sulawesi, was mostly in the sufficient category, which was 18 pregnant women (51.42%).<sup>9</sup> From the results of this study, it was found that the knowledge of pregnant women about how to choose a good toothbrush was in the poor category (54.18%). The low level of pregnant women's knowledge is influenced by the lack of initiative from the dentists or dental clinics to coordinate with the Mother and Children Health polyclinic at the public health center to provide education for pregnant women who come to the Mother and Children Health polyclinic to consult about their dental and oral health problems during pregnancy.

Based on attitude survey results showed that 27 pregnant women (79%) had attitudes in the moderate category. The results of this study are in line with a study conducted by Marwiyah and Dahlia (2018) on pregnant women at Citangkil Public Health Center, Cilegon, which stated that 58.8% of pregnant women had a positive attitude.<sup>10</sup> From the results of this study, it was found that the attitudes of pregnant women to the time of changing toothbrushes were in the poor category (54.12%). The results of this study are in line with a study conducted by Ambarwati (2021), which stated that only 10 (33%) of 30 pregnant women knew about the right time to change their toothbrushes. The right toothbrush is replaced every 3 months.<sup>11</sup> This is in accordance with a study by Setyaningtyas et al. (2018), which stated that each individual is expected to replace his toothbrush approximately once every 3 months.<sup>12</sup>

In the actions category, the results show that 68% of pregnant women were in the unfavorable category, which is 23 pregnant women). From the results of the questionnaire, it was found that most of the actions of pregnant women were in a bad category. The actions that were problematic for pregnant women were the actions of pregnant women in drinking medicine if the gums are swollen with a value of 20.59%, the action of taking medicine from the doctor for toothache with a value of 24.12%, and the action of using dental floss to clean food debris between the teeth with a value of 24.12%. From the results of the interviews with pregnant women at the Tana Lili Public Health Center, it was found that pregnant women almost never drink medicine from doctors when they experience swollen gums because they rarely go to the dentist for treatment. Pregnant women feel lazy to go to the dentist even though they have swollen gums because they think that the swollen gums are not a big problem. The gums will recover themselves. In addition, the actions of pregnant women in drinking medicine from the doctor when they have a toothache are also still low because the pregnant women prefer to buy toothache medicine at the nearest drug store or pharmacy. This is supported by Basic Health Research data (2018), which stated that 95.79% of the people of North Luwu have never received treatment from health medical personnel.<sup>1</sup>

According to the results of the behavior showed that 29 pregnant women (85%) were in the less category in carrying out dental and oral health checks during pregnancy. The results of this study are in line with a study conducted by Murni and Suwanti (2017) on pregnant women at the Narmada Public Health Center, which stated that the behavior of pregnant women in dental and oral health care during pregnancy was 73.5% having poor behavior.<sup>13</sup> The results showed that the lowest behavior conducted by the pregnant women towards dental and oral health checks during pregnancy was the behavior of visiting the dentist when experiencing bad breath problems with a value of 20%, when the gums are swollen with a value of 20.59%, for dental and oral health consultations with a value of 20.59%, and when the gums bleed with a value of 21.76%. The results of this study are in line with a study by Lei et al. (2019), which stated that only 10 (13.7%) of 73 pregnant women did dental and oral health control during pregnancy.<sup>14</sup> The lack of behavior in checking dental and oral health for pregnant women at the Tana Lili Public Health Center, North Luwu Regency is because pregnant women do not know about the relationship between dental and oral health and pregnancy. So, when pregnant women experience problems such as bad breath,

bleeding gums, and swollen gums, the pregnant women behave indifferently and only focus on their pregnancy. In addition, pregnant women also assume that checking with the dentist will cost a lot of money, so they prefer not to have their teeth and mouth checked by a dentist.

The results of this study indicate that there is a significant relationship between the level of knowledge on the behavior of checking the dental and oral health of pregnant women. The results of this study are in line with a study conducted by Muthi and Suwanti (2017), which stated that there is a significant relationship between the level of knowledge and the behavior of pregnant women in caring for dental and oral health during pregnancy.<sup>13</sup> Knowledge is the result of knowing that occurs after someone senses an object. Knowledge is influenced by several factors, which are education level, occupation, age, interests, experience, environment, and information.<sup>15</sup> Knowledge of pregnant women at the Tana Lili Public Health Center was sufficient (70%), but the behavior of checking dental and oral health still lacked (85%) due to a feeling of laziness that arises from pregnant women due to the influence of hormonal changes during pregnancy.<sup>4</sup> One of the factors that influence the low behavior of pregnant women at the Tana Lili Public Health Center, Luwu Utara Regency, was the environmental factor. Environmental factor has great power in determining behavior. It is a greater power than individual characteristics.<sup>16</sup>

Obtained results from this study that there is a significant relationship between the attitude of pregnant women towards the behavior of checking the dental and oral health of pregnant women in Puskesmas Tana Lili North Luwu Regency. Murni and Suwanti (2017) stated that there is a significant relationship between attitudes and individual behavior in caring for dental and oral health during pregnancy.<sup>13</sup> A study conducted by Marwiyah (2018) said that there is a significant relationship between attitudes and dental and oral health behavior of pregnant women. An attitude and knowledge possessed by someone will not necessarily materialize into real action. A supporting factor is needed so that the attitudes and knowledge can be realized into real action, such as the availability of facilities and a willingness in the individual to change because attitude is the result of the socialization process, which is someone's reaction or response to a stimulus that he receives. In addition, the experience that has been experienced by someone will affect the formation of his attitudes towards an object.<sup>12</sup>

Research conducted at the Tana Lili Health Center, North Luwu Regency, found that

there was a significant relationship between the actions of pregnant women on the behavior of checking the dental and oral health of pregnant women. In this study, the actions were measured based on the frequency of using dental floss, gargling after vomiting, brushing teeth, and so on, while the behavior was measured based on the frequency of visiting the dentist. The results of the study showed that the behavior of visiting the dentist was still lacking (85%). Munadirah (2017) stated that the behavior of visiting the dentist during pregnancy was only 13.3%.<sup>6</sup> The factors that influence the low of actions and behavior of pregnant women during pregnancy are the tendency of pregnant women to be indifferent to the health of their teeth and mouth. If dental and oral problems have not been perceived as a nuisance, the pregnant women do not complain to the health workers who check their pregnancy. Prospective mothers tend to be more worried about the health of their fetuses.<sup>4</sup> In addition, the environmental factor also has great power in determining behavior. It is a greater power than individual characteristics.<sup>16</sup> Based on the results of this study, it can be concluded that there is a significant relationship between the level of knowledge, attitudes, and actions and the behavior of checking the dental and oral health of pregnant women.

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