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Oral Health Status of Pregnant Woman Versus Non-Pregnant Women of Childbearing Age (15-44 Years) in Lao PDR

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aim: this study was to identify an oral health status, utilization of dental services, and impacts of oral health on daily living among pregnant and non-pregnant women in Lao PDR.
Methods: A cross-sectional study was conducted, among 150 pregnant and 150 non-pregnant women age 15–44 years old attending 103 Military Hospital of Vientiane. The study consisted of an interview and oral examination. All participants were examined for the presence of decayed, filled and missing teeth (DMFT), using the criteria from WHO Oral Health Basic Methods, 5th edition. Periodontal status was examined pocket depth by using WHO probe with marks at 3.5 and 5.5 mm and bleeding on probing was assessed by using normative (clinical examination) and by self-reported approaches. Oral Health Impact Profile (OHIP-14) were used to measures perceptions of the social impacts of oral disorders on their well-being, the questionnaire was developed in English and used validated questions from other questionnaires. Then it was translated into Lao.
Results: A total number of 300 participants. The prevalence of dental caries among all participants was 75%. In both estimates. Pregnant women had a higher prevalence (76%) than non-pregnant women (73%), but the differences were not statistically different. The mean number of decayed, filled and missing teeth DMFT was 3.25. The mean number of untreated decayed teeth (DT) was 2.04. The mean DMFT and DT were statistically higher among pregnant women (p= 0.001). no difference prevalence of pocket depth between both group. However, pregnant women had higher bleeding on probe than non-pregnant women (P= 0.011), The mean OHIP-14 score was higher in non-pregnant (9.6±8.7) than in pregnant women (7.7±7.6). There was strong significant positive relationship between DMFT, periodontal, bleeding and total OHIP-14 in pregnant women on functional limitation and pain.
Conclusion: pregnant women were high risk and poor oral health than non-pregnant women. Dental treatment needs and prevention program for women planning to pregnant. During pregnancy, women's oral hygiene education should be integrated into routine maternal care. It could also be of necessary step for the mothers to take responsibility for the oral health of their newborns.

Keywords: Pregnancy status; caries; periodontal diseases; OHIP-14.

1. INTRODUCTION

Lao PDR is located in Southeast Asia. It has a total area of about 236,800 km2. In 2019, about 7 million people (about 3.5 million women) live in its 18 provinces, with most 70% still living in rural areas [1]. However, urbanization is occurring at a rate of 36% in 2020 [2]. The Vientiane Capital is the capital city of Lao PDR. It is a small city with a total area of approximately 4,000 km^2. In 2019, nearly 1 million people (about 50% is women) live in Vientiane Capital [3]. Generally, women are an integral part of the agriculture sector in Lao PDR, comprising over 50% of the agricultural workforce and contributing significantly to all parts of agricultural production [4]. Lao PDR has reported highest maternal mortality rate (MMR) and infant rate (IMR) in Southeast Asia, with 357 maternal deaths per 100.000 live births and 68 infant deaths per 100 live births. Those who do not attend ANC and who give birth at home are also more likely to be poor, uneducated, and to live far from health facilities [5]. Pregnancy is an important milestone in the life-course of a woman. Directly or indirectly, pregnancy can contribute to the occurrence and severity of oral diseases such as dental caries and periodontal diseases. Which the most prevalent and at the same time preventable chronic conditions in every country, especially in poor communities. Oral diseases continue to exert a large burden to most societies in the world, especially in developing countries such as Lao PDR. Oral health may be considered an important part of prenatal care, poor oral health during pregnancy can lead to health outcomes for the mother and baby [6]. Some studies presented that Periodontal diseases during pregnancy associate the preterm birth/low birth weight. First periodonto pathogenic bacteria was found in the plaque of the gingiva due to a translocation phenomenon directly affect the fetus by bacteremia [7].

Thus, changes in dietary habits and oral hygiene practices over the hormonal changes during pregnancy can increase the risk of tooth decay and gingivitis. In addition, there are mistaken beliefs that dental treatment should be postponed during pregnancy. Nearly 60 to 75% of pregnant women have gingivitis due to accumulation of supragingival plaque, which may be aggravated (but not caused) by hormonal changes during pregnancy [8]. It has been

reported that dental caries and periodontal diseases may increase during pregnancy. Furthermore, there are specific periodontal conditions known as “gestational gingivitis” and “pregnancy epulis” depicting a localized inflammatory processes in the gingiva and interdental papillae occurring during pregnancy [9]. The oral health-related quality of life was significantly poorer in pregnant women with periodontal disease than in those without [9]. The proposed of present study to assess there are differences in dental caries and periodontal disease prevalence and severity and impacts on daily living among pregnant women. The result from this study will provide the information to develop of pregnancy guide book for oral health care program in pregnant women.

2. METHODOLOGY

The study design is cross-sectional focuses on comparing the prevalence and severity of dental caries, periodontal diseases between pregnant and non-pregnant women of childbearing ages, as well as their most common risk factors. The study was conducted among a selected group of women attending 103 Military Hospital, in Vientiane, Lao, PDR. The sample size was calculated based on prevalence of periodontal disease among women pregnant for the first time (primigravidae) was found to be 75% in the study with 95% confidence interval using the formula for expected population proportions the total sample size was 300 people. Sampling was done to satisfy sufficient participation in each group. Pregnant women who receiving obstetric services at the mother and Child Department, pregnant women who are between 15 and 44 years or age at any stage of pregnancy, no high risk of pregnancy complications, willingness to participate.

2.1 Quality of Life

The Oral Health Impact Profile-14 (OHIP-14) measures people’s perceptions of the social impacts of oral disorders on their well-being was validated version using only 14 questions (OHIP-14) is available [9], the answer choices are from “never” to “very often”. The OHIP-14 is a self-filled questionnaire that focuses on seven dimensions of impact (functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability and handicap) with participants being asked to respond according to frequency of impact on a 5-point Likert scale coded never (score 0), hardly ever (score 1), occasionally (score2), fairly often (score 3), very often (score 4) and not sure (score-5) using a twelve-months recall period. The total score ranges from 0 – 56.

2.2 Clinical Examination

Data collection was divided into two parts: interview and clinical oral examination. The interview used a face-to-face approach to obtain information from the questionnaire. The questionnaire was developed in English to use previously validated questions for each item. All participants were examined for the presence of decayed (DT), filled (FT) and missing teeth (MT) (DMFT using the criteria described in the WHO Oral Health Basic Methods, 5th edition [10]. Pocket depth and bleeding on probing was assessed by using normative (clinical examination) and self-reported approaches [11]. Pocket depth was measured from the gingival crest to the bottom of the pocket using these color bands, i.e., 3 mm or less mean is normal or healthy gum, more than 3 mm and less than 5.5 mm occur disease, and 5.5 mm or more was a periodontal disease occur in six sites per tooth. The participant was seated on a dental chair at Maxillo-facial department at 103 Military hospital. Mouth mirror, dental explorer was used for examination for dental caries, WHO periodontal probe was used for examination pocket depth and bleeding on prob. All variables were analyzed at a single variable level. Statistical differences were tested using T-test, ANOVA. Descriptive statistics were performed by calculating the mean, Standard deviation and percentages. A two-sample t-test was used to assess possible differences factor in pregnant and non-pregnant women. Statistical analysis was done using SPSS version 22.

3. RESULTS

The total sample size was 300 participants, 150 pregnant women who visited mother and child department and 150 of non-pregnant women who visited out-patient by protocol design to selected an equal number between pregnant and non-pregnant. However, patients in outpatient clinics were older than those coming to OBGYN, so, it was impossible to get a matched sample by age group. The mean age of pregnant women was 28 years, and the mean age for non-pregnant women was 33 years. The difference in age between pregnant and non-pregnant women was statistically significant (p=.001).

Fifty-four percent of all participants reported a family income of less than 3,000,000 Kip per month (80-300 US Dollars) (Table 1). Non-pregnant women reported a significantly higher income level than pregnant women (p=0.005). Forty-six percent of pregnant women had a monthly family income below 3 million Kip, compared with 62% of non-pregnant women. Fifty-four percent of pregnant women had a monthly family income greater than 3 million kip, compared with only 38% of non-pregnant women.

3.1 Self-reported Periodontal Status

Twenty-two percent of all participants reported having gum disease (Table 2). Gum-disease was reported by 31% of non-pregnant and 13% of pregnant women. The difference is statistically significant (p= 0.001). Fifty-six percent of participants reported receiving previous treatment for gum disease (p=0.465). Only 7 participants reported having ever been told by a dentist that they have lost bone around their teeth (2%). Half of participants (51%) described the state of teeth as “just fine”, 23% as “poor” or “very poor”, and 21% as “excellent” or “good”. Sixty-one percent of pregnant women and 55% of non-pregnant women reported their gums as “just fine”.

3.2 Dental Caries

Only 21% of participants reported receiving treatment or follow-up procedures and 15% reported going to the dentist because of pain or trouble in teeth or gums. Ninety-four participants provided reasons for not having dental visits. The most common explanation was never having dental problems. This reason was higher among pregnant women (92%) than among non-pregnant women (61%) (p=0.003).

The prevalence of dental caries (DMFT>0) was 75% and the prevalence of untreated decay (DT>0) was 66%. pregnant women had a slightly higher prevalence of untreated dental caries and dental caries (69%) than non-pregnant women (62%), there were no statistically significant differences. The mean number of decayed, missing and filled teeth (DMFT) was 3.7 in pregnant women, and 2.8 in non-pregnant women; these two means were statistically different (p=0.016).

Table 1. Characteristics of pregnancy and non-pregnant women aged 15-44 years attending 103 Military Hospital, Vientiane, Lao P.D.R.

Characteristics	Pregnancy status		*P value*
	Pregnant N (Col%)	Non-pregnant N (Col%)	
Age group			
15-44	Mean age (28)	Mean age (33)	<0.001
15-24	36 (24%)	22 (15%)	
25-34	104 (69%)	58 (39%)	
35-44	10 (7%)	70 (47%)	
Income			
< 3,000,000 kip	69 (46%)	93 62%)	0.005
> 3,000,000 kip	81 (54%)	57 (38%)	
Education			
Primary school	27 (18%)	13 (9%)	0.002
Secondary school	41 (27%)	36 (24%)	
High school	30 (20%0	22 (15%)	
University	40 (27%)	46 (31%)	
Not attended school	12 (8%)	33 (22%)	
Occupation			
Housewife	34 (23%0	11 (7%)	<0.001
Farmer	4 (3%)	5 (3%)	
Business	6 (4%)	3 (2%)	
Employee	63 (42%)	109 (73%)	
Other	43 (29%)	22 (15%)	

Table 2. Self-reported gum disease, history of having treatment for gum disease by pregnancy status among women aged 15-44 years in 103 Military Hospital

Do you think might have gum disease?	Pregnant N (Col%)	Non-pregnant N (Col%)	*P value*
Yes	20 (13%)	47 (31%)	<0.001
No	115 (77%)	76 (51%)	
Don't know	15 (10%)	27 (18%)	
Have you ever had treatment for gum disease?			
Yes	81 (54%)	86 (57%)	0.465
No	68 (45%)	61 (41%)	
Don't know	1 (1%)	3 (2%)	

Table 3. Prevalence of dental caries in the permanent dentition of pregnant women and non-pregnant women aged 15-44 years in Military 103 Hospital, Vientiane, Lao P.D.R.

Oral disease	Pregnant (150)		Non-Pregnant (150)		*P value*
	N	%	N	%	
Dental Caries					
Yes	104	69%	93	62%	0.181
No	46	31%	57	38%	
Gingivitis					
Yes	123	82%	104	69%	0.011
No	27	18%	46	31%	
Pocket depth					
Yes (PD≥4mm)	23	16%	25	17%	0.950
No (PD≤3mm)	127	84%	125	83%	

Table 4. Distribution of impacts and their frequency among pregnant and non-pregnant women aged 15-44 years using the Oral Health Impact Profile (OHIP-14), in 103 Hospital

Impact	Never N (%)	Hardly ever or Occasionally N (%)	Often or very often N (%)
1. Had trouble pronouncing words	268 (89%)	29 (10%)	3 (1%)
2. Felt worsened sense of taste	279 (93%)	17 (6%)	3 (1%)
3. Had pain	186 (62%)	105 (35%)	9 (3%)
4. Found uncomfortable to eat foods	195 (65%)	82 (27%)	23 (8%)
5. Been self-conscious	92 (31%)	40 (13%)	165 (56%)
6. Felt tensed	179 (60%)	87 (28%)	32 (11%)
7. Had unsatisfactory diet	196 (66%)	87 (29%)	16 (5%)
8. Had interrupted meals	208 (70%)	79 (26%)	12 (4%)
9. Found difficult to relax	225 (75%)	61 20%)	14 (5%)
10. Felt embarrassed	231 (77%)	56 (19%)	12 (4%)
11. Been irritable (upset) with others	234 (78%)	52 (17%)	13 (4%)
12. Had difficulty doing usual job	270 (90%)	26 (9%)	4 (1%)
13. Felt, life was less satisfying	252 (84%)	33(11%)	15(5%)
14. Been totally unable to function	282 (94%)	14 (5%)	4 (1%)

3.3 Periodontal Diseases

There were no statistically significant differences in the distribution of periodontal pockets by pregnancy status: (p=0.950). A significantly higher proportion of pregnant women had bleeding on probing (82%) than non-pregnant women (69%) (p=0.011). The mean number of teeth with bleeding on probing was the highest in women aged 35-44 years (5.8), but the mean number was similar in the younger age groups. The mean number of teeth with bleeding on probing was higher in pregnant women (5.5) than in non-pregnant women (4.4). However, there

Table 5. Distribution of the mean number of Oral Health Impact Profile (OHIP-14) among pregnant women and non-pregnant women aged 15-44 years in Military 103 Hospital

N= 300	Number Impacts	OHIP SCORE	OHIP score pregnant	OHIP score non-pregnant
Minimum	0	0	0	0
5% percentile	0	0	0	0
25% quartile	1	3	3	3
Median	2	6	6	7
75% quartile	6	13	10	15
95% percentile	11	25	23	26
Maximum	14	45	36	45
Mode	1	0	0	4
Mean	3.7	8.7	7.7*	9.6*
Standard deviation	3.6	8.3	7.6	8.7
Prevalence (1 or more)	84.3%	84.3%	82.7%	86.0%

- *T-test for differences in mean assuming equal variances: t=-2.05, p=0.0416*

were no statistically significant differences between pregnant and non-pregnant women in the mean number bleeding on probing.

3.4 Oral Health Impact Profile (OHIP-14)

The impact with highest prevalence was self-conscious because of their teeth, mouth (69%) with 156 participants (56%) reporting that this impact occurred often or very often. The group of impacts with the second largest prevalence was felt tense (40%), had pain (38%), found uncomfortable to eat foods (35%), and had unsatisfactory diet (34%). Only six percent reported being unable to function.

Eighty-four percent of women reported having one or more impacts on their quality of life. For those reporting impacts, the number of impacts ranged from 1 to 14, with a mean of 3.7±3.6.

4. DISCUSSION

Pregnant women had a higher prevalence dental caries (76%) than non-pregnant women (73%). These values were quite similar to those reported in Chiang Mai, Thailand [12], for the prevalence of dental caries among pregnant women (74.5%) but quite different from those for non-pregnant women (45.5%). Study from Patil et al reported a 63% prevalence of caries in pregnant women and 45% in non-pregnant women [13]. In the present study, non-pregnant women had a higher prevalence of dental caries than in other studies. The mean DMFT and DT were statistically higher among pregnant women. Similar results were reported in a 2009 study from India 2009 where the DMFT among pregnant women (4.08) was higher than among non-pregnant women (3.51) [14]. Regarding the degree of unattended need, study in 2019 from Indonesia [15] reported a mean DMFT=4.34, with mean DT=3.03 and mean MT=1.08. Overall, the results in the present study show a large prevalence and severity of dental caries among women in Lao, and similar to those reported in other countries [14,16,17]. Most dental caries remained untreated, and the most common treatment that women received was dental extraction.

4.1 Periodontal Status, Including Self-Reported Measures

There was no statistically significant difference in the prevalence of periodontal pockets between pregnant and non-pregnant women. Pregnant women had a higher prevalence of bleeding on probing (82%) than non-pregnant women (69%). A study from Thailand reported that pregnant women had gingivitis (86%) compared to non-pregnant women (73%) [12]. A study from India reported 72% of pregnant women had gingivitis in comparison to 61% in non-pregnant women [13]. The hormonal changes during pregnancy could explain these consistent effects across studies.

A study from Brazil [14] reported 40% prevalence of pockets 4-5 mm, and six percent prevalence of pockets greater than 6 mm among pregnant women. The figures from Brazil are much higher than those in the present study. Another study, this time from Indonesia, reported a 35% prevalence of periodontal pockets 4-5 mm and a two percent prevalence of pockets greater than 6 mm. Thus, the prevalence of periodontal pockets appears to be lower in Lao compared with other countries.

The overall self-reported periodontal disease (56%) is between the prevalence of periodontal pockets (15%) and bleeding on probing (76%). The discrepancy suggests that participants were not fully aware of what constitutes gum disease. Regarding differences between pregnant and non-pregnant women, only “do you think you might have gum disease” was higher among non-pregnant women (31%) compared with pregnant (13%), which contrasts with the lack of differences using clinical measures. A study from Uganda showed that the most commonly reported periodontal symptom was bleeding gums (49.8%), followed by toothache (31.8%), and pain in gums (24.2%) [18]. The finding from Ema Yunita Sar et all in 2020, found that most women had at least one oral symptom (84.9%): cavitated tooth (62.0%), bad breath (38.5%), bleeding gums (28.6%), and toothache (22.9%). About half of the women had untreated dental caries (58.9%). About half of the women had moderate to severe gingivitis (53.7%), and the odds were significantly higher in women who complained of bleeding gums. About half had periodontal pockets (46.3%) [19]. Women not having a dental visit 90% the main reason because they never had a dental problem (94% among pregnant and 88% among non-pregnant women). This lack of awareness on the importance of dental care is critical among pregnant women, who, due to their pregnancy, may avoid or delay dental treatment. Current policies in other countries recommend all women planning pregnancy, and all pregnant women schedule a preventive dental visit. A national study from the U.S. reported 58% of pregnant women had a dental visit in the previous year, lower than 65% among non-pregnant women [20]. A study from Iowa showed that only 49% had a dental visit during pregnancy, and the main reason for dental visits was check-ups and routine cleaning (96%). For those who did not report a dental visit during pregnancy, the most common reasons for not going to the dentist were, “I was not having a problem” [21, 22]. Oral health-related quality of life (OHRQoL) is one indicator of oral health related to negative impact of problems of oral well-being [23]. The present study reported 84% of participants had at least one oral impact on daily performances. The mean OHIP-14 score, non-pregnant women shown mean score of impact higher than pregnant women; the difference was statistically significant. The difference in OHIP-14 score may reflect other dimensions than dental disease. OHIP-14 score was similar to those reported in a study in India [24]. The most common impacts were self-consciousness (69%), followed by feeling tense (40%), had pain (38%). When comparing pregnant and non-pregnant women, the mean OHIP-14 scores were larger in non-pregnant women for six of the seven subscales but statistically significant only on function limitation and physical pain. Similarly result study from India found a mean OHIP-14 score of 6.8 in pregnant women. However, two studies in Shanghai found the mean OHIP-14 scores that were higher than that of the present study [25]. The main limitation of this study is that participants were not represent the entire Lao pregnant women. the study was the cross-sectional design which did not allow us to study the chronological order of the risk factors, outcomes and causation. However, this study provides an initial view of the oral health status of pregnant and non-pregnant women in Vientiane. Therefore, to generate an improvement of general health and oral health program to pregnancy women.

5. CONCLUSION

The result of the present study showed that pregnant women have poorer oral health status than non-pregnant women. It could be emphasized by midwives and gynecologists who are involved in maternity health for oral health care. Therefore, some participants felt or believe that dental treatment during pregnant might be risky for the fetus.

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval was approved from the Medical Ethics Committee of the University of Health Sciences Lao PDR, no 247—002

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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