A COMPARISON OF THE ORAL HEALTH STATUS BETWEEN PREGNANT WOMAN AND NON-PREGNANT WOMEN OF CHILDBEARING AGE (15-44 YEARS) IN MILITARY 103 HOSPITAL, VIENTIANE CAPITAL, LAO PDR

Comment [H1]: The manuscript and title writing does not refer to the author's guidelines.

ABSTRACT

Aim: This study to compare oral health status, utilization of dental services, and impacts of oral health on daily living of pregnant and non-pregnant women.

Comment [H2]: What method is used to measure the utilization of dental services?

Method: A cross-sectional study was conducted among 150 pregnant and 150 non-pregnant women of 15–44 years' age attending the Outpatient Department and Department of Mother and Child in 103 Military Hospital of Vientiane Capital city. 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 (clinicalexamination) and by self-reported approaches. Oral Health Impact Profile (OHIP-14) (Slade and Spencer, 1997) 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.

Result: The prevalence of dental caries (DMFT>0)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 DMFT was 3.25. The mean number of untreated decayed teeth was 2.04. The mean DMFT and DT were statistically higher among pregnant women (p= 0.001). There was no difference prevalence of pocket depth between pregnant and non-pregnant women. However, pregnant women had higher bleeding on probe than non-pregnant women (P= 0.011), The mean OHIP 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.

Comment [H3]: The author used a statistical analysis of T-test and ANOVA in this study. What analysis was used by the author to measure the relationship between DMFT, periodontal bleeding and total OHIP-14 in pregnant women?

Conclusion: pregnant women were risk and poor oral health than non-pregnant women. Dental treatment needs to prevent oral disease and an effect to quality of life.

Keys word: pregnancy status, Caries, Periodontal diseases, OHIP-14

Introduction

Oral diseases are 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.

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. 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. This study focuses on comparing the prevalence and severity of dental caries and 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.

Lao PDR is located in Southeast Asia and shares border with Myanmar to the northwest, China to the north, Vietnam to the east, Cambodia to the south, and Thailand to the west. 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 km2. The capital is divided into 9 districts. 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].

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 [5]. 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 [6]. The oral health-related quality of life was significantly poorer in pregnant women with periodontal disease than in those without[7].

Comment [H4]: What are the benefits, urgency and future direction of this research?

Methodology

The study design is cross-sectional on pregnant women and non-pregnant women age 15–44-year-old of the 103 Military Hospital, Vientiane Capital, Lao PDR. The sample size for the present study was calculated based on prevalence of periodontal disease among women pregnant for the first time (primigravidae) was found to be 75% in the study. For the present study, the sample size was determined at 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.Non-pregnant womenwho are not currently pregnant and who visit the hospital in an out-patient basis for any reason other than pregnancy was included.

Comment [H5]: What is the reference to calculate sample size?

Quality of life

The OHIP 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 [8], 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.

Ethical Approval

Ethical approval was sought from the Medical Ethics Committee of the University of Health Sciences Lao PDR. All required approvals were completed before data collection to comply with all ethical regulations. Only participants who had signed a consent form were allowed to participate in the study.

Clinical Examination

All participants were examined for the presence of decayed, filled and missing teeth (DMFT),and mean number DMFT of using the criteria described in the WHO Oral Health Basic Methods, 5th edition [9]. Finally, we used the WHO cut-off point of 3 and 6 DMFT to assess the severity of dental caries at the population level.Pocket depth and bleeding on probing was assessed by using normative (clinicalexamination) and by self-reported approaches. 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. Six sites per tooth were measured, i.e., mesio-buccal, mid-buccal, disto-buccal, disto-lingual, mid-lingual, and mesio-lingual; the largest of all six measurements was used to score the tooth.self-reported measures were used the CDC-AAP questions on periodontal disease. These questions have been validated in national surveys in the U.S. [10]. Data collection was conducted at the 103 Military Hospital in Vientiane and divided into two parts: interview and clinical oral examination. The research team consisted of four people: two interviewers was nurse in OBGY department, one dentist for clinical examiner, and one dentist was a recorder. The team was trained in the interview and recording processes. 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. The questionnaire had the different components described above. The interview was done before the oral examination. The full interview took approximately 20 minutes.

All clinical examinations were conducted by the principal investigator. The examiner was trained to examine dental caries and periodontal disease using the criteria described above. For the oral examination, 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. Data conversion and statistical analysis was done using SPSS version 22. The calculation and recording were made in SPSS. All variables were analyzed at a single variable level. Statistical differences were tested using T-test, ANOVA.

Comment [H6]: What is the reference for assessing pocket depth and bleeding on probing?

Comment [H7]: Please explain this sentences?

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 ofless 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.

Table 1. Age and income by pregnancy status among non-pregnant women aged 15-44 years attending 103 Military Hospital, Vientiane, Lao P.D.R.

Age group	Pregnancy status		Total N (Col%)
	Pregnant N (Col%)	Non-pregnant N (Col%)	
15-44	Mean age (28)	Mean age (33)	
15-24	36 (24%)	22 (15%)	58 (19%)
25-34	104 (69%)	58 (39%)	162 (54%)
35-44	10 (7%)	70 (47%)	80 (27%)
Income			
< 3,000,000 kip	69 (46%)	93 62%)	162 (54%)
> 3,000,000 kip	81 (54%)	57 (38%)	138 (48%)
Education			
Primary school	27 (18%)	13 (9%)	40 (13%)
Secondary school	41 (27%)	36 (24%)	77 (26%)
High school	30 (20%0	22 (15%)	52 (17%)
University	40 (27%)	46 (31%)	86 (29%)
Not attended school	12 (8%)	33 (22%)	45 (15%)
Occupation			

Housewife	34 (23%0	11 (7%)	45 (15%)
Farmer	4 (3%)	5 (3%)	9 (3%)
Business	6 (4%)	3 (2%)	3 (3%)
Employee	63 (42%)	109 (73%)	172 (57%)
Other	43 (29%)	22 (15%)	65 (22%)
Total	150	150	300

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. There was no statistically significant difference in having gum treatment by pregnancy status(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". Fifty-eight percent of participants described the state of their gums as "just fine," 21% as "excellent" or "good". Sixty-one percent of pregnant women and 55% of non-pregnant women reported their gums as "just fine"

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%)	Total N (Col%)
Yes	20 (13%)	47 (31%)	67 (22%)
No	115 (77%)	76 (51%)	191 (64%)
Don't know	15 (10%)	27 (18%)	42 (14%)
Have you ever had treatment for gum disease?			
Yes	81 (54%)	86 (57%)	167 (56%)
No	68 (45%)	61 (41%)	129 (43%)
Don't know	1 (1%)	3 (2%)	4 (1%)
Total	150	150	300

Utilization of Dental Services

Sixty-nine percent of participants had at least one lifetime dental visit. This percentage was slightly higher among non-pregnant women (71%) than among pregnant women (66%). Forty-eight percent of participants reported having a routinecheck-up or tooth cleaning in the previous dental

visit. Twenty-one percent 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. There were no statistically significant differences between pregnant and non-pregnant women in the reported reasons for the previous dental visit (p=0.576).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%). There were statistically significant differences for never having a dental visit and other reason between pregnant and non-pregnant women (p=0.003).

The prevalence of dental caries (DMFT>0) was 75% and the prevalence of untreated decay (DT>0) was 66%. Although pregnant women had a slightly higher prevalence of untreated dental caries and dental caries than non-pregnant women, there were no statistically significant differences (both p= .05).

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., 2020

Participant	N	Prevalence of untreated decay DT > 0*		Prevalence of dental caries DMFT > 0**	
		N	%	N	%
Pregnant	150	104	69%	114	76%
Non-pregnant	150	93	62%	110	73%
Total	300	197	66%	224	75%

Age was stratified into three groups, 15-24, 25-34, and 35-44. The prevalence of dental caries and untreated decay increased in the first two age groups, 15-24 and 25-34 years, but then declined in the oldest age group, 35-44 years. The mean number of missing teeth increased by age group and the mean number of filled teeth increased between the youngest age group, and then decrease in the oldest age group. However, changes in the mean number of missing or filled teeth reached no statistically significant (both p= .05). 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). The difference is completely attributable to the DT component; pregnant women had a significantly higher mean number of untreated decayed teeth than non-pregnant women (p=0.001).

Comment [H8]: Why was age-stratified into three groups?

Table 4. Mean number of decayed, missing, and filled permanent teeth (DMFT) by age group among pregnant and non-pregnant women aged 15 to 44 years in Military 103 Hospital Vientiane, Lao P.D.R., 2020

Age	N	Decayed teeth (DT)*		Missing teeth (MT)**		Filled teeth (FT)***		Decayed, missing & filled teeth (DMFT)****	
		Mean	sd	Mean	sd	Mean	Sd	Mean	sd
15-24	58	2.89	2.77	0.48	0.94	0.22	0.85	3.75	3.40
25-34	162	2.12	2.47	0.69	1.38	0.40	0.98	3.38	3.29
35-44	80	1.26	1.43	0.95	1.57	0.23	0.57	2.61	2.61
Pregnant status	N	Mean	sd	Mean	sd	Mean	Sd	Mean	sd
Pregnant	150	2.50	2.71	0.71	1.23	0.32	0.95	3.69	3.41
Non-pregnant	150	1.59	1.86	0.73	1.50	0.32	0.78	2.81	2.84
Total	300	2.04	2.36	0.72	1.37	0.32	0.87	3.25	3.17

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 (54%) than non-pregnant women (46%) (p=0.011).

The mean number of teeth with periodontal pockets 3mm or less decreased slightly by age group, from 27.1 in the 15-24 age group to 26.5 in the 35-44 age group. There were so few teeth with periodontal pockets between 4 and 5 mm or greater than 6 mm were so small, that the mean was close to zero. 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. However, there were no statistically significant differences between pregnant and non-pregnant women in the mean number of teeth with periodontal pockets at the three categories or bleeding on probing.

Table 5. Mean number of teeth with periodontal pockets and bleeding on probing among pregnant women and non-pregnant women aged 15-44 years, in 103 Hospital, Vientiane, Lao P.D.R.

pregnant status		Periodontal Status									
	N	Pockets ≤3 mm*		Pockets 4-5 mm**		Pockets 6 mm+**		No Bleeding†		Bleeding††	
		Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd
pregnant	150	26.7	1.9	0.4	1.5	0.0	0.1	21.7	5.1	5.5	4.7
Non-pregnant	150	26.9	1.8	0.3	0.9	0.0	0.0	22.8	5.5	4.4	5.2
Total	300	26.8	1.9	0.3	1.2	0.0	0.1	22.2	5.3	4.9	5.0

Oral Health Impact Profile (OHIP-14)

Table 6 shows the distribution of the 14-item OHIP questionnaire with answers recoded into three categories, never, hardly ever/occasionally, and often/very often. The impact with highest prevalence was self-conscious because of their teeth, mouth or dentures (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.

Table 6. 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, Vientiane, Lao P.D.R.

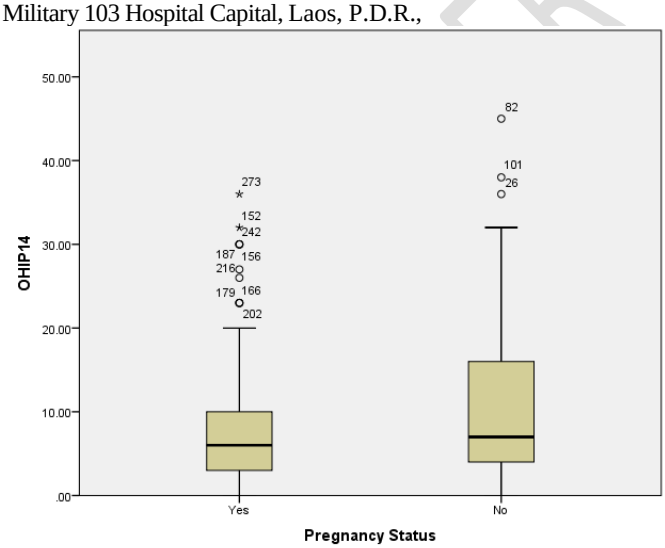
Impact	Never N (%)	Hardly ever or Occasionally N (%)	Often or very often N (%)
1. Had trouble pronouncing words	268 (89%)	29 (10%)	3 (1%)
2. Felt worsened sense of taste	279 (93%)	17 (6%)	3 (1%)
3. Had pain	186 (62%)	105 (35%)	9 (3%)
4. Found uncomfortable to eat foods	195 (65%)	82 (27%)	23 (8%)
5. Been 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%)

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.

The OHIP score was calculated by adding the scores for each item in the questionnaire. The responses were coded as 0=Never, 1=Hardly ever, 2=Occasionally, 3=Often, 4=Very Often. Thus, the OHIP minimum score would be 0, and the maximum 56 (14x4). In the sample, the mean OHIP score was 8.7±8.3 with a range from 0 to 45. By definition, the prevalence of OHIP-14 is the same as the prevalence of impacts i.e., 84%, but the prevalence of OHIP-14 in non-pregnant women was higher than in pregnant women (86% and 83% respectively). Figure 1. display the box-and-plat distribution of OHIP score by pregnancy status.

Figure 1. Mean OHIP 14 score among pregnant women and non-pregnant women aged 15-44 years in Military 103 Hospital Capital, Laos, P.D.R.,



The OHIP-14 instrument was designed to be composed of seven subscales, each one formed by two items in the questionnaire. Table 7. provides the scores for each subscale.

The mean OHIP score was higher in non-pregnant women (9.6±8.7) than in pregnant women (7.7±7.6). The difference was statistically significant (p=0.042). In all OHIP subscales non-pregnant women had higher scores than pregnant women except for psychological discomfort. However, the difference between pregnant and non-pregnant women was statistically significant only in function limitation and physical pain.

Table 7. Mean OHIP-14 score distribution among pregnant and non-pregnant women aged 15-44 yearsin 103 Hospital, Vientiane, Lao P.D.R.

Subscales	All		Pregnant		Non-pregnant		Difference in means	p-value
	Mean	SD	Mean	SD	Mean	SD		
Function limitation	0.32	0.96	0.12	0.52	0.51	1.23	0.40	p<0.001
Physical pain	1.50	1.76	1.23	1.72	1.76	1.77	0.53	p=0.009
Psychological discomfort	3.29	2.45	3.35	2.49	3.22	2.42	-0.13	p=0.643
Physical disability	1.35	1.98	1.14	1.89	1.56	2.05	0.42	p=0.068
Psychological disability	0.99	1.75	0.82	1.53	1.17	1.94	0.35	p=0.086
Social disability	0.66	1.40	0.51	1.16	0.82	1.58	0.31	p=0.052
Handicap	0.59	1.34	0.53	1.31	0.64	1.37	0.11	p=0.491
OHIP-14	8.68	8.26	7.71	7.64	9.65	8.74	1.94	p=0.042

Discussion

The prevalence of dental caries (DMFT>0) among all participants was 75%. The prevalence of untreated decay (DT>0) was 66%. In both estimates, pregnant women had a higher prevalence (76%) than non-pregnant women (73%), but the differences were not statistically different. These values were quite similar to those reported in Chiang Mai, Thailand [11], for the prevalence of dental caries among pregnant women (74.5%) but quite different from those for non-pregnant women (45.5%). A study from India reported a 63% prevalence of caries in pregnant women and 45% in non-pregnant women [12]. In the present study, non-pregnant women had a higher prevalence of dental caries than in other studies.

The mean number of decayed, missing and filled teeth was 3.25. The mean number of untreated decayed teeth was 2.04. Thus, most of the caries experience was in the form of untreated decay (unattended

needs). 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)[13]. Regarding the degree of unattended need, a 2019 study from Indonesia [14] 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 developing countries. Most dental caries remained untreated, and the most common treatment that women received was dental extraction.

Periodontal status, including self-reported measures

Fifteen percent of participants had periodontal pockets between 4 and 5 mm, while less than one percenthad pockets greater than six millimeters in at least one tooth. In contrast, 76% of participants had bleeding on probing. There was no statistically significant difference in the prevalence of periodontal pockets between pregnant and non-pregnant women. Still, 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%) [11, 22]. A study from India reported 72% of pregnant women had gingivitis in comparison to 61% in non-pregnant women [12]. The hormonal changes during pregnancy could explain these consistent effects across studies. The hormonal changes may facilitate an inflammatory response in the gingival tissues to the supragingival biofilm.

A study from Brazil [13] reported 40% prevalence of pockets 4-5 mm, and six percentprevalence 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 [14]. Thus, the prevalence of periodontal pockets appears to be lower in Lao compared with other countries, and there are no differences between pregnant and non-pregnant women.

Sixty-seven percent of all women reported having gum disease, while 56% said they had had treatment for gum disease.The other two questions from the CDC-AAP self-reported tool to measure periodontal status (teeth with mobility and being told they have lost bone around their teeth) were below three percent. The latter may reflect the lower prevalence of pockets greater than 6 mm and the low dental service utilization (below). 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%) [15]. The finding from EmaYunita Saret all in 2020, found thatmost 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%) [16].However, the CDC-AAP tool has not been used outside the United States.

In the present study, 25% of all participants reported having their teeth in poor or very poor status. Similarly, 18% of all participants reported having their gums in poor or very poor status. In both cases, there were no differences by pregnancy status. These variables reflect an overall self-assessment of the oral health status related to dental caries and periodontal diseases. The values, however, are lower for both diseases when contrasted with examination data. On the other hand, over 95% agree that teeth are important. In these assessments, there were no differences between pregnant and non-pregnant women. Finally, 68% of participants agree that dental caries can be prevented, with a statistically higher proportion among non-pregnant women.

Utilization of dental services

Seventy-one percent of non-pregnant women and 66% of pregnant women reported a previous dental visit. Around 40% in each group had a dental visit in the last year, and 21% in the previous six months. Still, 60% of participants have not had a dental visit within the recommended time frame. Consistent with these results, over 90% of all women not having a dental visit indicated this was 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 [17]. 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" [18]. Many psychological and behavioral factors played a role of dental seeking behavior, including oral health practices, oral health and pregnancy beliefs, and health care maintenance [19]

Oral Impacts on Daily Living

Oral health-related quality of life (OHRQoL) is one indicator of oral health. In this study, OHRQoL was assessed with the 14-item Oral Health Impact Profile. This scale measures the negative impact of problems related to teeth, mouth, or dentures on physical, psychological, and social dimensions of oral well-being [20]. The OHIP-14 was used because it has been used in other countries, including studies on women.

The present study reported84% of participants had at least one oral impact on daily performances.The number of impacts ranged from 1 to 14. The mean number of impacts was 3.7. The most important measure, themean OHIP-14 score, was 7.7 in pregnant women and 9.6 in non-pregnant women; the difference was statistically significant. Because of the lack of clear differences in dental caries and periodontal diseases by pregnancy status, the difference in OHIP-14 score may reflect other dimensions than dental disease. However, the OHIP-14 score was similar to those reported in a study in India [21]. The study, however, reported a lower OHIP-14 score (4.2) among non-pregnant women. In the present study, the most common impacts were self-consciousness (69%), followed by feeling tense (40%), had pain (38%), uncomfortable to eat (35%), and unsatisfied diet (34%). 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. The present study reported a mean OHIP-14 score of 7.7 in pregnant. Similarly result study from Australia found a mean OHIP-14 score of 6.8 in pregnant women. However, two studies in Brazil found the mean OHIP-14 scores that were higher than that of the present study. These results are at odds with the clinical outcomes. There is no clear way to explain the discrepancy beyond, possibly, the lack of understanding of the questions during the interview. In summary, OHIP-14 did not provide expected results, and its effects may be biased.

Strengths and Limitations

The main limitation of this study is that participants were recruited from 103 Military Hospital, so the finding may not represent the entire Lao pregnant women. Also, equal numbers of pregnant and non-pregnant women were selected to maximize the comparisons. Thus, aggregate figures do not represent the patient population at 103 Military Hospital either.

The other limitation of the study was the cross-sectional design which did not allow us to study the chronological order of the risk factors and outcomes, not permitting determination of causation.

The major strength of this study is that it is the first to document the oral health status, behaviors, and dental care utilization among pregnant women in Lao. This study provides an initial view of the oral health status of pregnant women in Vientiane.

Conclusions

The result from the present study pointed to poorer oral health status among pregnant women than non-pregnant women. Pregnant women had higher prevalence of untreated dental caries and caries experiences than non-pregnant women, mean DT and DMFT in pregnant women also higher in non-pregnant women.Dental treatment needs to prevent oral disease and an effect to quality of life in both group.

REFERENCES

Comment [H9]: The reference does not refer to the author's guidelines.

1. Lao Statistics Bureau. Population 2019. Lao Statistics Bureau. (2021). https://www.lsb.gov.la/en/home/.
2. World Bank. Urban Population (% of total population) – Lao PDR. The World Bank. (2021). https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=LA.
3. Lao Statistics Bureau. Population by provinces. Lao Statistics Bureau. (2021). https://laosis.lsb.gov.la/tblInfo/TblInfoList.do.
4. FAO (2018). Country Gender Assessment of Agriculture and the Rural Sector in Lao People's Democratic Republic. Food and Agriculture Organization of the United Nations (FAO). http://www.fao.org/3/CA0154EN/ca0154en.pdf.
5. Wu M, Chen SW, Jiang SY. Relationship between gingival inflammation and pregnancy. Mediators Inflammation (2015). ID 623427.

6. Laine MA. Effect of pregnancy on periodontal and dental health. Acta OdontolScand; (2002), 60(5):257-264.
7. Hsiang-Hsi Honga, Yi-Heng Chenb , Po-Jen Chengc, Min-Yu Changd and Li-Lan Chuang. Risk factors associated with periodontal disease and its impact on quality of life among pregnant women. journal of obstetrics and gynaecology 2023, VOL. 43, NO. 2, 2264382 https://doi.org/10.1080/01443615.2023.2264382
8. Slade GD.Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol(1997); 25:284-290.
9. World Health Organization. Oral Health Surveys Basic Methods 5th Edition(2013).
10. Eke PI, Dye BA, Wei L, et al. Self-reported measures for surveillance of periodontitis. J Dent Res(2013).; 92:1041-1047.
11. Rakchanok N, Amporn D, Yoshida Y, Harun-Or-Rashid M, Sakamoto J. Dental caries and gingivitis among pregnant and non-pregnant women in Chiang Mai, Thailand. Nagoya J; Med(2010).; 72 43-50.
12. Patil S, Ranka R, Chaudhary M, Handde A, Sharma P. Prevalence of dental caries and gingivitis among pregnant and nonpregnant women. J Datta Megha Inst Med Sci Univ(2018). ; 13:44-47.
13. Marianna Vogt, Antonio W Sallum, José G Cecatti and Sirlei S Morais. Factors associated with the prevalence of periodontal disease in low-risk pregnant women. Vogt et al. Reproductive Health 2012, 9:3 http://www.reproductive-health-journal.com/content/9/1/3
14. UdijantoTedjosasongko, FridiantyAnggraeni, Mok Li Wen, SatitiKuntari. Prevalence of Caries and Periodontal Disease Among Indonesian Pregnant Women. PesquisaBrasileiraemOdontopediatria e ClínicaIntegrada(2019) , DOI:10.4034/pboci.2019.191.90
15. Margaret N Wandera, Ingunn M Engebretsen, Charles M Rwenyonyi, James Tumwine, Anne N. Periodontal status, tooth loss and self-reported periodontal problems effects on oral impacts on daily performances, OIDP, in pregnant women in Uganda: a cross-sectional study. Health and Quality of Life Outcomes 2009, 7:89 doi:10.1186/1477-7525-7-89
16. EmaYunita Sari, NorkhafizahSaddki,* and AzizahYusoff. Association between Perceived Oral Symptoms and Presence of Clinically Diagnosed Oral Diseases in a Sample of Pregnant Women in Malaysia. Int J Environ Res Public Health. 2020 Oct; 17(19): 7337.

17. Azofeifa A, Yeung LF, Alberson CJ, Eugenio Beltan-Aguilar ED. (2014). Oral Health conditions and dental visits among pregnant and nonpregnant women of childbearing age in the United States, National Health and Nutrition Examination Survey, 1999-2004. Prev Chronic Dis; 11:140212.
18. Rola Al Habashneh , Janet M Guthmiller, Steven Levy, Georgia K Johnson, Christopher Squier, Deborah V Dawson, Qian Fang. Factors related to utilization of dental services during pregnancy J Clin Periodontol 2005 Jul;32(7):815-21.doi: 10.1111/j.1600-051X.2005.00739.
19. Juliana Schaia Rocha; Letícia Yumi Arima; Renata Iani Werneck; Samuel Jorge Moysés; Márcia Helena Baldani. Determinants of Dental Care Attendance during Pregnancy: A Systematic Review. Caries Res (2018) 52 (1-2): 139–152.
20. Khalaf SA, Osman SR, Abbas AM, Ismail AMAM. Knowledge, attitude and practice of oral healthcare among pregnant women in Assiut, Egypt. Int J Community Med Public Health(2018).; 5:890-900.
21. Shashidhar Acharya MDS, Parvati V. Bhat MD. Oral-Health-Related Quality of Life during Pregnancy. Public Health Dentistry. First published: 01 June 2009https://doi.org/10.1111/j.1752-7325.2008.00104.x
22. Reddy KMP, Hunasgi S, Koneru A, Amrutha R, Manvikar V. (2017). Comparison of oral health status among pregnant and non-pregnant women residing in Raichur district. J Adv Clin Res Insights; 4:158-161.