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The Guidance Book on Dental Check for Pregnant Women toward the Health Status of Periodontal Tissue and Treatment Need Index

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Abstract
Background: *The presence of a dental checkbook can help preventive and promotive actions for pregnant women to create health of mother and fetus.*
The Objective: *The purpose of this research is to identify the role of the companion book of dental check in pregnant women on the health status of periodontal tissue at Community Health Center of Banyumanik Subdistrict Semarang, Indonesia.*
Method: *Type of research used is an experiment with pretest and posttest- as well as control group design. The sample is the 85 pregnant women who visited Community Health Center in Ngesrep and Padangsari Subdistrict Banyumanik Semarang City. 50 pregnant women given dental checkbook serve as the treatment group while 35 pregnant women without given the book are treated as the control group. The variables measured are changes in periodontal tissue status and Treatment Need index.*
Results: *The result of this research is data of periodontal tissue in pregnant women group at Ngesrep Community Health Center and Padangsari Banyumanik Semarang Health Center, there were 35% with six unhealthy sextants, and only 7% have six healthy sextants. There is a change in the status of periodontal tissue of pregnant women, especially the condition of bleeding gums/gingivitis becoming healthy after being given dental health checkbook.*
Conclusion: *Statistically, there is no difference in periodontal tissue status after being given the book of dental check checklist for a pregnant woman in Banyumanik Subdistrict Semarang City.*
Keywords*: dental health checkbook, periodontal tissue status, Treatment Need Index.*

Introduction

Every pregnant woman should maintain health during pregnancy, including oral and dental health. Poor oral health conditions of pregnant women may impact on fertility and fetal development (Bartini, 2012). During pregnancy, estrogen and progesterone hormone are changed. The changes cause various complaints such as cravings, nausea, vomiting and including toothache and mouth due to the habit of ignoring oral hygiene (Gajendra, 2004). Pregnant women should be aware of the importance of maintaining oral health during pregnancy for themselves and the fetus to avoid the occurrence of oral diseases that may affect fertility. Therefore improvement of oral health and health promotion can reduce the

appearance of mouth disease (Bugrant et al., 2012).

Currently, a lot of attention is directed at dental and mouth health of pregnant women because it is suspected to relate with periodontal disease and pregnancy problems such as premature birth, low birth weight, and preeclampsia (Abiola et al., 2011). Oral diseases that occur during pregnancy are not solely influenced by pregnancy itself but also by the knowledge, attitudes, and actions of pregnant women (Piere et al., 2007). Besides, the behavior of dental visits is influenced by factors such as personal factors, economic status, and knowledge of oral and dental relations (Mwaiswelo, 2007).

Hormonal changes in pregnant women can trigger gingivitis. Several studies have suggested that the effects of hormonal changes will affect dental and mouth health in pregnant women by 60%, of which 10-27% have a gingival enlargement. In Indonesia, gingivitis is a problem of the mouth and teeth that are often experienced by pregnant women, which is about 5% - 10% have gingival enlargement (Yoto et al., 2013).

Continuous gingivitis may cause pregnant women to have complaints in the oral cavity such as pregnancy periodontitis. Periodontitis pregnancy is a problem of oral infection during pregnancy, occurs in the dental support network (Harshanur, 2002). Periodontitis may develop from untreated gingivitis (inflammation or infection of the gums) (Wiriawan & Elly, 2002). The infection will extend from the gums to the bone below the tooth causing wider damage to the periodontal tissues (Manson & Eley, 2002). A condition can be called periodontitis when the adhesion between the periodontal tissues and the teeth is damaged. Besides, the alveolar bone which is the bone supporting the teeth is damaged. The infection will extend from the gum to the bone beneath the tooth causing widespread damage to the periodontal tissues. (Manson & Eley, 2002). Inflammation of this periodontal tissue rarely receives attention from patients because of its less disruptive symptoms (Affandi, 2006). During pregnancy, an increase in estrogen and progesterone levels increases vascularization, causing the gingival blood vessels to be more permeable and sensitive in receiving responses to local irritants such as plaque, calculus, and caries (Hasibuan, 2004). If this happens, the bacteria in the plaque can penetrate the bloodstream, invading the placenta, so the placenta provides a mechanism of resistance by increasing the levels of prostaglandin hormones that cause increased uterine contractions and induces premature births (Agueda, Echeverria & Manau, 2008).

Based on a preliminary study at several Community Health Clinic in Semarang area, the data of pregnant women's patient visit to dental polyclinic of Community Health Clinic is still deficient at 0.1, and one of the causes is the pregnant women have toothache complaints. The data indicate the low knowledge and motivation of pregnant women and the role of health workers related to referring this problem to dental polyclinics.

Materials and Methods

The type of research used is an experiment with a research design that used is pretest and posttest-only with control group design. The sample is a pregnant mother in trimester I, II and III numbering 85 who visited the Community Health Clinic at Ngesrep and Padangsari Sub-district of Banyumanik City Semarang. 50 pregnant women given the treatment of dental checkbook while 35 pregnant women without given the checkbook of teeth are the control group.

The variables measured as affected variables are changes in Community Periodontal Index for Treatment Needs (CPITN) and Treatment Need Index (TN). The dental checkbook includes dental hygiene guides during pregnancy, dental health behavior questions, objective data of dental examinations and periodontal tissues.

Result and Discussions

The primary results are presented in the following tables.

Table 1 Periodontal tissue status

Periodontal tissue status	n	%
6 unhealthy sextants	30	35 %
5 unhealthy sextants	25	30 %
4 unhealthy sextants	11	12 %
3 unhealthy sextants	8	10 %
2 unhealthy sextants	4	5 %
1 unhealthy sextants	1	1 %
0 unhealthy sextants	6	7 %
Total	85	100%

Table 2 Periodontal health condition

Score	Periodontal tissue condition	n	%
(0)	Healthy	6	7%
(1)	Bleeding	8	9%
(2)	Calculus	68	80%
(3)	Shallow Pocket	3	4%
(4)	Pocket In	0	0%
	Total	85	100%

Table 3 Frequency distribution of CPITN scores of pregnant women before and after administration of dental checkbook (treatment group)

Score	CPITN	before		after	
		n	%	n	%
(0)	Healthy	0	0%	10	20%
(1)	Bleeding	7	14%	0	0%
(2)	Calculus	40	80%	37	74%
(3)	Shallow Pocket	3	6%	3	6%
(4)	Pocket In	0	0%	0	0%
	Total	50	100%	50	100%

Table 4 Frequency distribution of CPITN score of pregnant women before and after without giving a dental checkbook (control group)

Score	CPITN	before		after	
		n	%	n	%
(0)	Healthy	6	17%	15	43%
(1)	Bleeding	1	3%	0	0%
(2)	Calculus	28	80%	20	57%
(3)	Shallow Pocket	0	0%	0	0%
(4)	Pocket In	0	0%	0	0%
	Total	35	100%	35	100%

Table 5 Frequency distribution of Treatment Needs

Score	TREATMENT NEED	n	%
(0)	No maintenance required	6	7%
(1)	Improved oral hygiene	8	9%
(2)	Scaling and improving oral hygiene	68	80%
(3)	Scaling and oral hygiene treatment	3	4%
(4)	Scaling, oral hygiene treatment & root planning	0	0%
	Total	85	100%

Table 6 Frequency Distribution of Treatment Needs before and after administration of dental checkbook (treatment group)

Score	TREATMENT NEED	before		after	
		n	%	n	%
(0)	No maintenance required	0	0%	10	20%
(1)	Improved oral hygiene	7	14%	0	0%
(2)	Scaling and improving oral hygiene	40	80%	37	74%
(3)	Scaling and oral hygiene treatment	3	6%	3	6%
(4)	Scaling, oral hygiene treatment & root planning	0	0%	0	0%
	Total	50	100%	50	100%

Table 7 Frequency distribution of Treatment Needs before and after without giving a dental checkbook (control group)

Score	TREATMENT NEED	before		after	
		n	%	n	%
(0)	No maintenance required	6	17%	15	43%
(1)	Improved oral hygiene	1	3%	0	0%
(2)	Scaling and improving oral hygiene	28	80%	20	57%
(3)	Scaling and oral hygiene treatment	0	0%	0	0%
(4)	Scaling, oral hygiene treatment & root planning	0	0%	0	0%
	Total	35	100%	35	100%

Statistic test is performed to determine the effect of giving treatment using Wilcoxon test, and then the influence of the role of a dental health checkbook is tested with Mann Whitney test.

Table 8 Wilcoxon and Mann Whitney test

Group	Wilcoxon Test		Mann Whitney Test	
	p-value	description	p-value	description
Treatment Group	0.000	significant	0.256	Not significant
Control Group	0.000	significant		

Based on data of periodontal tissue in pregnant women group at Ngesrep Community Health Center and Public Health Center of Padangsari Banyumanik Semarang, there were 35% with six unhealthy sextants, and only 7% have six healthy sextants. The most severe condition is a shallow pocket at 4%. This is following the preliminary study data at Semarang Community Health Center that the data of pregnant women's patient visits to dental policlinic of Public Health Center is still shallow at 0.1. Figures 0.1 is also because the pregnant women have a toothache complaints.

After one month of pregnant dentist's checkbook to pregnant women shows the status of

periodontal tissue changes. Changes that occur are the conditions that had been bleeding gingiva on the next visit (1 month) is healthy. This is due to the possibility of pregnant women reading information from a companion book dental check that contains pregnant women dental care. According to Carranza (2012), the changes that occur in the gingiva appear to be excessive although the amount of plaque as a local irritant factor is not too much. Besides, progesterone together with estrogen can cause dilation of blood vessels so that often occurs enlargement in gingival pregnant women. The most prominent changes during pregnancy associated with periodontal tissue are the presence of pregnancy gingivitis and epulis gravidarum. Gingival bleeding is caused by local factors, plaque deposits due to maximal tooth cleansing.

The presence of tartar can be a trigger of severe periodontal tissue conditions. The results of examination of pregnant women showed 80% the presence of tartar. After treatment, the state of tartar in pregnant women is only slightly decreased. This is probably due to pregnant women are still reluctant to come to dental polyclinic to clean tartar. The condition that dental care needs are the presence of shallow pockets. Shallow pocket data in pregnant women showed by 3% and unchanged after treatment. According to Mwaiswelo (2007), the behavior of visits to dentists is influenced by factors such as personal factors, economic status, and knowledge of oral and dental relationships.

Provision of the pregnant dental checkbook to pregnant women statistically did not show a significant difference. It is possible the condition of tartar, shallow pocket and pocket in the mother should be done intensive dentistry. The situation of gingival bleeding can be overcome with the maintenance of daily dental hygiene. Information about daily dental hygiene is already included in the book. The pregnant women read the report and may have applied the practices every day.

Index of Treatment Need (TN) of periodontal tissue indicates 80% required the scaling action. Treatment Need periodontal tissue is needed to determine the health of periodontal tissue to be healthy in order not to cause further severity in the form of tooth loss. Especially pregnant women with periodontal tissue health can determine the health of the fetus they bear. According to a study conducted at the University of North Carolina, pregnant women with moderate to severe moderate to moderate risk have an increased risk of preterm delivery seven times higher than pregnant women with healthy periodontal tissue. In a study of 850 pregnant women before and after birth, it was concluded that periodontal disease contributes to premature birth (Offenbacher et al., 2009).

There are four bacteria directly correlated between maturation of plaque and periodontitis, i.e., *Bacteroides forshythus, Porphyromonas gingivalis, Actinobacillus actinomycetemcomitans, Treponema denticola*. These bacteria are found to be more numerous in women who give premature babies than women who deliver on time. These bacteria can produce lipopolysaccharides, proteins, cytokines, and trigger inflammation through the bloodstream. Periodontal pathogenic bacteria stimulate the production of prostaglandins and inflammatory components that can cause cervical dilatation and uterine contractions. The process of bacterial displacement that can trigger premature birth can be started from the bacteremia. Bacteremia often occurs in people with unhealthy periodontal conditions, i.e., bleeding on the gingiva either spontaneously or during brushing. Suffering on the gingiva can trigger the occurrence of bacteremia, and subsequent inflammation will pass through the blood circulation system through the placenta (Habashneh et al., 2009).

Conclusion

Based on the above research results it can be concluded that:

1) The worst periodontal tissue condition in pregnant women in Banyumanik subdistrict Semarang is the score of 3 (shallow pocket).

2) Pregnant women in Banyumanik subdistrict Semarang by 35% have six unhealthy sextants, and 7% have six healthy sextants.
3) Index of Treatment Needs (TN) of periodontal tissue in pregnant women in subdistrict Banyumanik Semarang is equal to 80% in the form of scaling and improvement of dental hygiene
4) There is a change in the status of periodontal tissue of pregnant women, especially the condition of bleeding gums/gingivitis become healthy after being given dental health checkbook.
5) Statistically, there is no difference in the status of periodontal tissue after being given a companion book of dental checks for pregnant women in Banyumanik Subdistrict, Semarang
6) Index of Treatment Needs (TN) of periodontal tissue also changes after being given a companion book of dental examinations for pregnant women in Banyumanik Subdistrict, Semarang
7) The dental checkbook may contribute to improving the health of pregnant periodontal tissue and decreasing the index of Treatment Need for the periodontal tissue.

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