

## ***The Use of Brewed Herbs Mouthwash for Overcoming Morning Sickness***

1<sup>st</sup> Sri Widatiningsih  
Department of Midwifery  
Poltekkes Kemenkes Semarang Indonesia  
s.widatiningsih@gmail.com

2<sup>nd</sup> Siti Rofiah  
Department of Midwifery  
Poltekkes Kemenkes Semarang Indonesia  
nandasheeta@yahoo.com

3<sup>rd</sup> Ristiyanawati  
Department of Midwifery  
Poltekkes Kemenkes Semarang Indonesia  
Ristiyanawati5@gmail.com

**Abstract**—The most common discomfort at first trimester of pregnancy is nausea followed by vomiting, known as morning sickness. The condition tends to be worse if it is not treated properly, which will cause poor pregnancy outcome. Some brewed herbs including cloves, cinnamon, and nutmeg can be used as mouthwash to relieve nausea and vomiting, however there were lack of study to prove its efficacy. This study was aimed to determine the effectiveness of brewed herbs (cloves, cinnamon, and nutmeg) mouthwash in dealing with morning sickness among pregnant women. This is a quantitative – pre experiment study with *one group pretest-posttest* design, held in the work area of Candiroto Subdistrict Public Health Center-Temanggung Regency. A total sampling was conducted with 45 respondents. *Pregnancy-Unique Quantification of Emesis/Nausea* (PUQE) index was used as measurement tool, and Wilcoxon statistical test was applied. The result showed both brewed clove and nutmeg were effective in overcoming morning sickness (*p-value* 0.001 and 0.016 respectively; *z-score* -3.426 and -2.401 respectively), while cinnamon was not (*p-value* 0.19, *z-score* -1.604). The PUQE-score mean difference for clove, nutmeg, and cinnamon were 6.47; 0.93; and 0.53 respectively. It can be inferred that clove is the most effective herb in overcoming morning sickness compared to nutmeg and cinnamon. It is recommended for pregnant women to use brewed clove as mouthwash in alleviating morning sickness. Health practitioners were suggested to promote the use of brewed clove in dealing with morning sickness. There is an opportunity for the health office in collaboration with local herbal industry to develop non-pharmacological product such as clove mouthwash to treat morning sickness.

**Keywords:** Brewed Herbs, Mouthwash, Morning Sickness

### **1. INTRODUCTION**

Pregnancy is a reproductive process that requires special care to achieve safe labor and give birth to a healthy baby. Nausea and vomiting which usually occurs in the morning, known as morning sickness, is a common complaint experienced by pregnant women, especially at first trimester <sup>1</sup>. It occurs in 50-90% of pregnant women. The incidence in *primigravida* is around 60-80% and 40-60% in *multigravida*. This condition can last for months <sup>2</sup>. Morning sickness is caused by increasing of estrogen and *Human Chorionic Gonadotropin (hCG)*, which might continue to *hyperemesis gravidarum* if not treated immediately <sup>3</sup>. Continual morning sickness can decrease body fluids, and poor blood circulation that can interfere with maternal health and fetal development <sup>4</sup>. Researchers found that early onset of the nausea and vomiting within the first five weeks of gestation was significantly tied to the likelihood of a child having a developmental delay.

Various efforts can be made by health professionals in helping to overcome morning sickness pharmacologically, however it can be harmful. Therefore, non-pharmacologically measures such as herbal remedy is preferred. Cinnamon is usually used to treat nausea and vomiting in form of cinnamon tea which contains essential oils, *safrole, eugenol, calcium oxalate, cinnamaldehyde, resin, tannin and tanners*. Essential oils in cinnamon have a distinctive odor as relaxant as well as a sedative effect which can inhibit receptors at the vomiting center <sup>5</sup>. Cloves contain essential oils, *eugenol, oleanolic acid, galotanic acid, phenilin, karyofilin, resin and gum*. Essential oils in cloves can also help reduce nausea and vomiting, and are often used to treat morning sickness in pregnancy <sup>6</sup>. In addition, nutmeg contains a lot of essential oils that can neutralize and are useful as carminative, spasmolytic, and antiemetic so that it can be used to treat nausea and vomiting <sup>7</sup>. Cloves and nutmeg contain *eugenol* which is harmful if consumed, therefore it is

recommended to use them as antiemetic in form of mouthwash<sup>8</sup>. There has never been a study regarding the use of brewed clove, cinnamon and nutmeg as mouthwash in reducing morning sickness.

## 2. MATERIALS AND METHOD

This study was a pre-experimental, with one group *pretest-posttest* design. The population of this study were all first and second trimester pregnant women within the working area of Candiroto Community Health Center. Data were obtained from 45 pregnant women as respondents which drew by a total sampling technique. Samples were taken based on inclusion criteria, namely pregnant women who experience nausea vomiting, general condition is good, do not experience gastrointestinal diseases such as typhoid, gastritis, no history of cinnamon, cloves and nutmeg allergy and no other psychological stress. The exclusion criteria were pregnant women taking anti-nausea drugs or disobey to do the intervention routinely. Data collection begins by dividing the respondents into 3 groups, they are the group of cinnamon, cloves, and nutmeg. Each group consisted of 15 respondents. Subsequently they were given a questionnaire before treatment to measure the incidence of nausea and vomiting that was filled in by the respondents accompanied by 1 enumerator in each group. An allergic test was conducted prior the treatment by rinsing the respondents' mouth using brewed cinnamon, cloves and nutmeg. The researcher then asked for help and approval from the respondent's family (husband /significant others) who lived one house with the respondent to supervise the treatment.

Treatment for the first group by means of  $\pm 1$  cm cinnamon brewed with 200 ml hot water. The second group was treated with 5 clove buds brewed with 100 ml of hot water. Third group was 1 teaspoon of nutmeg powder brewed with 250 ml of hot water. The mixture is awaited cold then used to rinse mouth for 7 consecutive days, in the morning before consuming any food. Then again measuring the frequency of nausea and vomiting of pregnant women using a questionnaire on the 8th day with the help of enumerators. The measurement tool in form of *Pregnancy-Unique Quantification of Emesis / Nausea (PUQE)* Index was calculated based on 3 questions including nausea, experiencing retching (movement and sound before vomiting), dry mouth and not causing vomiting and vomiting<sup>9</sup>. Bivariate analysis of Wilcoxon statistical test was conducted with a significant level of 0.05.

## 3. RESULTS AND DISCUSSION

Table 1. Distribution of Frequency for Morning Sickness Degree

Variables	Group 1 Cinnamon				Group 2 Clove				Group 3 Nutmeg			
	Before		After		Before		After		Before		After	
	N	%	N	%	N	%	N	%	N	%	N	%
Mild	0	0	1	6,7	0	0	13	86,7	0	0	1	6,7
Moderate	13	86,7	13	86,7	12	80	2	13,3	13	86,7	14	93,3
Severe	2	13,3	1	6,7	3	20	0	0	2	13,3	0	0

Tabel. 2 The Difference of PUQE Score Before and After Intervention

Groups	PUQE Score	Mean	Mean Difference	SD	Min-Max	P value*	Z score
Cinnamon (n=15)	Before	10.40	0.53	1.68	8-13	.109	-1,604
	After	9.87		2.13	6-13		
Clove (n=15)	Before	10.87	6.47	1.84	8-14	.001	-3,426
	After	4.40		1.40	3-7		
Nutmeg (n=15)	Before	10.93	0.93	1.62	8-14	.016	-2,401
	After	10.00		1.64	6-12		

Note:

PUQE=Pregnancy-Unique Quantification of Emesis/Nausea

\* = Wilcoxon test

### **The Occurrence of Morning Sickness Before and After Cinnamon Mouthwash Treatment**

The mean value of morning sickness incidence before given cinnamon was 10.40 (moderate and severe levels) <sup>9</sup>. The occurrence of morning sickness can be caused by changes in the endocrine system that occurs during pregnancy, especially caused by high fluctuations in levels of hCG (*human Chorionic Gonadotrophin*), at 12 -16 first week, where it becomes the highest level <sup>3</sup>. An increase in the amount of placental tissue also increases the total hours of nausea in early pregnancy.

The results showed that morning sickness level after having cinnamon mouthwash was 9.87 which considered still at the level of moderate and severe. The content of essential oil in cinnamon affects nausea in terms of having a distinctive odor which acted as relaxant. Besides, it has a sedative effect and can work to inhibit receptors at the vomiting center <sup>5</sup>.

The simple brewing process might cause the ingredients extracted from the cinnamon was not well-controlled which might reduce its efficacy. This was likely to be the cause of pregnant women who experience morning sickness and take brewed cinnamon were still experience moderate and severe level of morning sickness.

### **The Occurrence of Morning Sickness Before and After Clove Mouthwash Treatment**

Before given the brewed clove mouthwash, the mean value of the occurrence of morning sickness was 10.87 (severe and moderate levels). The occurrence of morning sickness varying from mild to unbearable all day long. Nausea vomiting in pregnancy can affect both the mother and the fetus<sup>2</sup>. Therefore, it needs to be given an intervention, one of them is the non-pharmacological method <sup>10</sup>. Essential oils in cloves are very effective in dealing with nausea and vomiting <sup>6</sup>.

The mean value of the incidence of morning sickness after treatment was 4.40 (mild and moderate levels)<sup>9</sup>. Cloves contain essential oils, *eugenol, oleanolic acid, galotanic acid, phenilin, karyophylline, resin and gum* <sup>6</sup>. The chemical properties and pharmacological effects of cloves are warm and they taste sharp and aromatic. Cloves also have the benefits in dealing with toothache, sinusitis, nausea and vomiting, bloating, colds, headaches, inflammation of the stomach, coughing, late menstruation, rheumatism, measles, and others <sup>11</sup>.

### **The Occurrence of Morning Sickness Before and After Nutmeg Mouthwash Treatment**

Before having nutmeg mouthwash, the mean value of the incidence of morning sickness was 10.93 which is at moderate and severe levels. The mean value of the incidence of morning sickness after getting nutmeg is 10 (moderate level). Nutmeg contains a lot of essential oils, *fatty oils, saponins, miristisin, elimination, lipase enzymes, pectin, hars, tanned substances, lemonena, and oleanonic acid* <sup>7</sup>. Nutmeg have a distinctive odor that can be used to relieve nausea <sup>12</sup>. The study of nutmeg leaf proven that it has a substance which can be used as a health drink to reduce nausea and vomiting<sup>11</sup>.

### **Effectiveness of cinnamon mouthwash for morning sickness**

The Wilcoxon test with *p* value of 0.109 means that cinnamon was not effective in reducing the incidence of morning sickness, with the percentage of the morning sickness incidence at moderate level (86.7%) more than the severe level (13.3%), and after given cinnamon the result remained the same. This proved that cinnamon were not effective in alleviating morning sickness. Cinnamon has antioxidant properties widely used as a flavor in food and drink which is usually done by adding the original ingredients directly into food or fluid<sup>11</sup>. Although essential oils in cinnamon have a distinctive odor that can be used as relaxant, sedative and inhibit receptors at the vomiting center <sup>5</sup>, but the amount of flavor extracted can be reduced by simple brewing process which lessen its efficacy<sup>11</sup>.

In addition the use of cinnamon to overcome morning sickness must be limited for pregnant women<sup>13</sup> because it can stimulate uterine contractions and in some cases can cause premature labor. So in this study the size of cinnamon is only  $\pm 1$  cm . This might cause the cinnamon is not effective.

### **Effectiveness of clove mouthwash for morning sickness**

The *p* value of 0.001 with the *Z* value of -3.426 meant that clove was effective to reduce morning sickness. This was supported by the percentage level of the incidence of morning sickness before the treatment was

moderate level (80%) more than the severe level (20%), and after the treatment it decreased to mild levels (86.7%) more than the moderate level (13.3%). Giving clove for mouthwash in the morning before consuming anything can reduce the rate of nausea and vomiting in pregnancy by 3 times compared to before intervention.

The typical clove aroma is produced by the eugenol compound, which is the main compound (72-90%)<sup>14</sup>. The results of this study indicate that clove is effective for reducing the incidence of morning sickness because it contains essential oils, *eugenol*, *oleanolic acid*, *galotanic acid*, *phenillin*, *karyophylline*, *resin* and *gum*. Clove oil is a natural source of *Eugenol*. *Eugenol* plays an important role in the pharmaceutical industry because it can be used as an analgesic, stimulant, coronary odor, medication for heartburn and relieving nausea and vomiting<sup>11</sup>. Essential oils in cloves are very effective in dealing with nausea and vomiting, therefore it is often used to treat morning sickness in pregnancy. The sharp aroma and taste of cloves comes mainly from *eugenol* will help to overcome the symptoms of morning sickness<sup>6</sup>.

#### **Effectiveness of nutmeg mouthwash for morning sickness**

The p value = 0.016 and the Z value = -2.401, meant that nutmeg was proven to be effective in reducing the incidence of morning sickness, supported by the percentage of morning sickness incidence before treatment was moderate level (86.7%) more than the severe level (13, 3%), and after the treatment the incidence of morning sickness was at a moderate level (93.3%) more than the mild level (6.7%). After gargling using brewed nutmeg in the morning before consuming anything, complaints of nausea and vomiting can be reduced by 2-fold.

The results showed that nutmeg was effective for treating nausea and vomiting. Nutmeg is an Indonesian native plant originating from Banda Island. This plant has economic and multipurpose value<sup>11</sup>. Nutmeg contains a lot of essential oils, *fatty oils*, *saponins*, *miristisin*, *elimination*, *lipase enzymes*, *pectin*, *hars*, *tanned substances*, *lemonena*, and *oleanonic acid*<sup>7</sup>. Nutmeg contains a lot of essential oils, *fatty oils*, *saponins*, *miristisin*, *elimination*, *lipase enzymes*, *pectin*, *hars*, *tanned substances*, *lemonena*, and *oleanonic acid*<sup>7</sup>. Nutmeg fragrance have many health benefits and are widely used to relieve nausea or symptoms of motion sickness while driving<sup>11</sup>.

Nutmeg is one of the native plants of Indonesia, especially in Eastern Indonesia, such as Maluku. Various benefits of nutmeg, especially the fruit has been widely known, one of which is in the pharmaceutical field as one of the non-pharmacological alternatives to overcome various complaints. Essential oils and other nutmeg preparations have strong anti-oxidant effects that can inhibit oxidative stress. The content of other substances such as *myristicine*, *elemicine* which has a unique effect resembling the effects of narcotics which if explored deeply will certainly provide diverse benefits. One of them is to overcome the symptoms of morning sickness<sup>15</sup>. Nutmeg seed produces essential oils of 2-15% while nutmeg mace produces 7-18% of essential oils<sup>16</sup>. Nutmeg oil has a distinctive aroma determined by the content of the compounds in the oil, both the main compound and the minor compound. Nutmeg oil compounds give a distinctive odor, such as  $\pm$  88% *hydrocarbon monoterpenes* with the main components of *camphene*, *pinene*, *myristicin*, and *alcohol monoterpenes* such as *geraniol*, *linalool*, *terpineol*, and other components such as *eugenol* and *methyl eugenol*<sup>10</sup>. Nutmeg with a strong aroma that can be used as a sedative-hypnotic drug and empirically nutmeg seeds are often used by the community as sleeping pills and cold medicines<sup>11</sup>.

#### **4. CONCLUSION**

The results showed that clove and nutmeg were effective to overcome morning sickness. Clove was more effective compare to nutmeg. Pregnant women can use brewed clove mouthwash to deal with nausea and vomiting at appropriate dose because it was proven to be the most effective. Health practitioners were suggested to promote the use of brewed clove in dealing with morning sickness. There is an opportunity for the health office in collaboration with local herbal industry to develop non-pharmacological product such as clove mouthwash to treat morning sickness.

## 5. ACKNOWLEDGEMENT

We thank the pregnant women for their voluntary participation, the midwives and the head of Candirotto Subdistrict Public Health Center for the extraordinary support.

## REFERENCE

1. Lacasse A, Rey E, Ferreira E, Morin C, Berard A. Validity of a Modified Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) scoring index to asses severity of nausea and vomiting of pregnancy. *Am J Obs Gynecol.* 2008;198:71.e1–71.e7.
2. Wiknjosastro H. *Ilmu Kebidanan*. Yayasan Bina Pustaka Sarwono Prawirohardjo; 2009.
3. Tiran. *Mual Muntah Kehamilan Seri Asuhan Kebidanan*. Jakarta: EGC; 2009.
4. Hidayati R. *Asuhan Keperawatan Pada Kehamilan Fisiologis Dan Patologis*. Jakarta: Salemba Medika; 2009.
5. Hidayat. *Kitab Tumbuhan Obat*. Jakarta: Agriflo; 2015.
6. Rasy. *30 Tanaman Herbal Untuk Pengobatan Tradisional*. Yogyakarta: Sakti; 2013.
7. Prasetyono. *A-Z Daftar Tanaman Obat Ampuh Di Sekitar Kita*. Yogyakarta: Flashbooks; 2012.
8. Suparni. *Herbal Nusantara : 1001 Ramuan Tradisional Asli Indonesia*. Yogyakarta: Andi Offset; 2012.
9. Tekoa. Evidence-Based Approaches To Managing Nausea and Vomiting in Early Pregnancy .
10. Harnani ED, Da'i M, Munawaroh R. Perbandingan Kadar Eugenol Minyak Atsiri Bunga Cengkeh (*Syzygium aromaticum* (L.) Meer. & Perry) dari Maluku, Sumatera, Sulawesi, dan Jawa dengan Metode GC-MS Determination. *PHARMACON.* 2010;11(1):25-32.
11. Rahmawati F. Kajian Potensi “Wedang Uwuh” sebagai Minuman Fungsional. Presented at the: 2011.
12. Ismiyanto, Ngadiwiyana, Mustika R. Isolasi, Identifikasi Minyak Atsiri Fuli Pala (*Myristica fragrans*) dan Uji Aktivitas Sebagai Larvasida. *J Kim Sains dan Apl.* 2009;12(1):23-30.
13. Hussein. *Pengobatan Rukiyah Dengan Terapi Kayu Manis*. Sukabumi: Adamssein Media; 2015.
14. Wael S, Mahulette F, Watuguly TW, et al. Pengaruh Ekstrak Daun Cengkeh ( *Syzygium aromaticum* ) terhadap Limfosit dan Makrofag Mencit Balb / c Effect of Leaf *Syzygium aromaticum* on Lymphocytes and Macrophages Mice Balb / c. 2018;23(July):79-83.
15. Kamelia LPL, Silalahi PY. Buah Pala sebagai Salah satu Fitofarmaka yang Menjanjikan di Masa Depan. *Mollusca Medica.* 2018;11(1):205-211.
16. Sipahelut SG, Telussa I. Karakteristik Minyak Atsiri Dari Daging Buah Pala Melalui Beberapa Teknologi Proses. *J Teknol Has Pertan.* 2011;IV(2):126-134.