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# *Effect of Supportive Counseling Using a Positive Psychology Approach on Improving the Severity of Nausea and Vomiting in Pregnant Women: A Randomized Controlled Trial*

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## Abstract

***Background:*** Pregnancy nausea and vomiting (NVP) are common complaints in the early period of pregnancy.
***Objectives:*** The present study aimed to determine the effects of the positive psychology approach on improving the severity of NVP.
***Methods:*** This randomized controlled clinical trial was conducted on 60 pregnant women with mild and moderate NVP in Zanjan province, Iran in 2020-2021. Pregnant women under study were divided into two experimental and control groups by block randomization method. Six counseling sessions were held for the experimental group regarding the treatment protocol of a positive psychological approach twice a week for 60 minutes. Data were collected using the Rhodes and demographic questionnaire and then analyzed using Chi-square, Fisher exact test, independent t-tests, repeated measure ANOVA test with a confidence level (CI) of 95% in SPSS 16 software.
***Results*:** As regards the demographic analysis, there was no statistically significant difference between the two groups. However, based on obstetric characteristics, the difference was significant between the two groups in terms of the number of pregnancies. The analysis showed that the mean (SD) severity of NVP in the experimental group was (11.60 ± 2.73) before the intervention, (5.0 ± 2.5) immediately and (3.73 ± 2.50) four weeks after the intervention. There were significant differences in the severity of NVP immediately (P values =0.014) and after four weeks of the intervention between the two groups (P values =0.031).
***Conclusion:*** The use of a positive psychological counseling approach reduced the severity of NVP and improved maternal health.

***Keywords: nausea, pregnancy, vomiting, women's health, training support, counseling, psychology, positive***

## Introduction

As a prevalent symptom in the early stage of pregnancy, NVP affects 50-90% of pregnancies [1]. It includes a set of symptoms such as nausea, vertigo, vomiting, sensitivity to smell, and increased craving for some foods, along with alterations in functioning and effectiveness of daily tasks, mood, and fatigue [1]. The cause of NVP is complex and unknown, including some social, biological, and psychological aspects [2]. Addressed it not promptly leads to Hyperemesis Gravidarum (HG). HG is severe nausea and vomiting bothering 1-3% of mothers. Some diagnostic signs are consistent vomiting,

ketonuria, weight loss of more than 5%, and electrolyte changes such as dehydration and hypokalemia [3], leading to considerable fetal and maternal complications [4]. Nevertheless, it is impossible to prevent most of these adverse outcomes in the early phases with timely treatment [5].

The etiology of NVP is not yet known. Thus, most treatments are concentrated on eliminating symptoms instead of stating the underlying causes. Various methods have been used to manage NVP, including non-pharmacological and pharmacological interventions (dietary changes, ginger, vitamin B6 (pyridoxine), antihistamines, dopamine antagonists, serotonin antagonists, acupressure (using sea bands), etc.) The effectiveness of these treatments is different in treating symptoms [6]. The discomfort of pregnant women regarding the side effects of medications and their impact on embryonic health makes them choose non-pharmacological solutions to decrease the severity of vomiting and nausea. Considering the relationship between psychological factors and NVP severity, psychological content counseling as a viable alternative can be used by healthcare professionals and counselors to treat and manage NVP [7].

The positive approach is one of the psychological methods that has recently received the attention of researchers. This strategy was pioneered by Martin Seligman in 2000 [8]. It is concentrated on positive qualities, empowerment, and psychological capital, including personal skills, hope, happiness, faith, optimism, perseverance, patience, rationality, self-sacrifice, and work ethics. Psychological capital includes virtue, life satisfaction, piety, and various perceptions in different cultures and periods [9]. A positive psychology approach was primarily aimed to increase well-being and comfort [10]. Silicon indicated that positive interventions had impressive effects on the treatment of depression [11]. Such an approach is effective in reducing negative and unpleasant feelings for several reasons. For instance, in this approach, training exercises directly affect interpersonal communication, increment self-awareness and comprehension of ability, and individuals' strengths. It also increases self-confidence while reducing anxiety and stress [9]. Moreover, positive psychology improves the quality of life of women with unwanted pregnancies [12]. In positivist interventions, happiness is increased, thus reducing negative emotions by increasing and recognizing individual abilities, as well as managing and reducing their weaknesses [13]. Nevertheless, there is insufficient information on the effectiveness of this counseling approach in different pregnancy situations, mostly in the reduction of the severity of NVP. The timely management of this problem is one of the objectives of midwifery care and reducing the severity of this problem in early pregnancy has a significant effect on improving the health in pregnant women [14]. The positivist approach has an effect on a person's mental and emotional states, which causes a positive and pleasant feeling, which in this way causes the reduction of negative emotions, physiological problems, and anxiety in pregnant women [15]. Hence, the present study sought to examine the effects of supportive counseling with a positive psychological approach to improving the severity of NVP.

## Methods

This randomized clinical controlled trial study was conducted on 60 pregnant mothers in Zanjan (Iran) From September 2020 to October 2021. Ten health centers were chosen, among 35 health centers, as the study environment. These centers were selected for convenience sampling. The study population included pregnant women with NVP who were registered in the National Electronic Identification System (CIB). Qualified individuals were contacted to participate in the study, Individuals who did not have the desire or conditions to participate in the study were excluded and the other qualified individuals were replaced.

The inclusion criteria included healthy pregnant women with a mild to moderate nausea vomiting severity score in terms of the Rhodes questionnaire, the age range of 18-35 years, a pregnancy period of 6-10 weeks based on the last mensural period data (LMP), the literacy of at least elementary school in the Persian language, not taking anti-nausea drugs before the intervention, and willingness to voluntarily participate in the study.

Non-inclusion criteria were symptoms of miscarriage, infertility treatment in a recent pregnancy, a history of stillbirth in a previous pregnancy, history of known gastrointestinal/liver and medical diseases, and stressful events including high-risk and stress during previous pregnancies, having problems with current fertility (miscarriage, endangering the life of the mother or child, etc.), extreme stress at work, childhood and adolescent abuse or trauma, stressful events In life (death or illness of a loved one), domestic violence from the spouse and inappropriate social support during pregnancy which was three months ago and at the time of the study. Exclusion criteria included absence of more than two sessions in counseling sessions or failure to complete questionnaires and increasing severity of NVP.

Considering that we had no access to similar study results, the sample size was determined by a pilot study on 10 women in the study. The power of the test was 80% considering the variable severity of vomiting and nausea with a mean (M) and standard deviation (SD) in the intervention ($M_1$= 4.8 and $SD_1$ = 2.6) and control ($M_2$ = 3.1 and $SD_2$ = 1.9) groups with a test level of 95%. The total size was determined with a 5% drop out of 30 people in each group to obtain the formula for computing the average sample size in the two independent groups.

Among 150 people meeting the criteria for entering the study, 60 pregnant women were randomly assigned to two groups of experimental (A) and control (B) via the Block random sampling method with fifteen blocks of four. Random numbers reached 60 people, and the random sequences were conducted by an individual who was not involved in the study, blinding one blind was implemented (Figure 1).

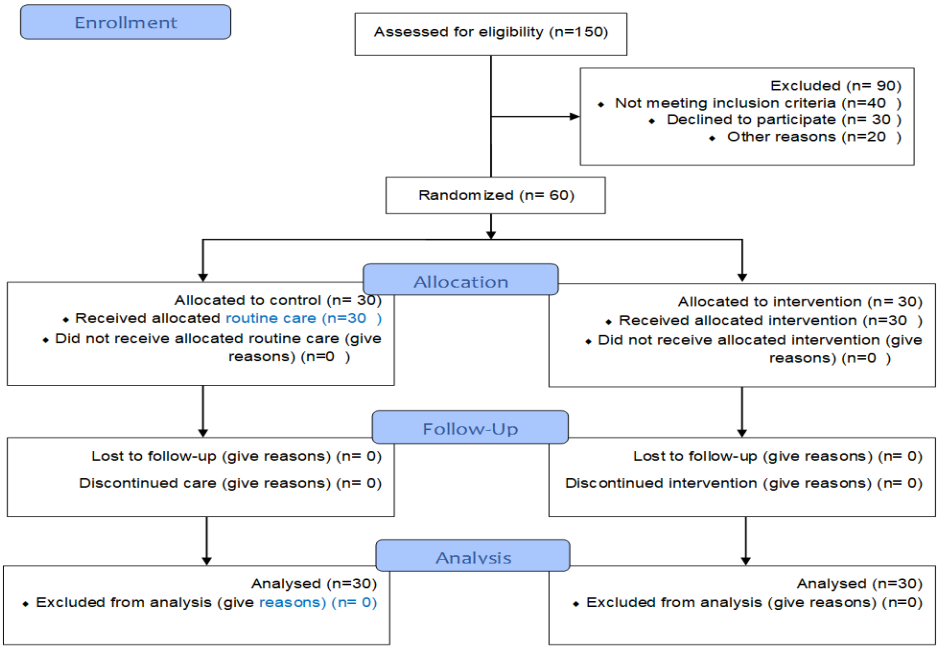


***Figure: The Process of Participants Enrolment***

The intervention was individually performed for the intervention group in six sessions twice a week. Each session was 60 minutes based on Martin Seligman and Tayyab Rashid protocols [9]. The number of counseling sessions was eight based on a similar study [16]. The number of sessions was modified to six owing to the coronavirus disease 19 (COVID-19) epidemic, and the number of referrals was reduced to the health center for women. For the experimental

group, the counseling method was completed by the first author who also accomplished the counseling training course via a positive psychology method in a private center in Tehran. Then, a protocol was prepared by researchers and research advisors, including the content of the training sessions. These counseling sessions were face-to-face individual counseling held in health and treatment centers in a sanitary environment based on observing the social distance, by following the relevant protocols (observing social distance and masks), and proper ventilation. During the intervention, there was no sample drop in any of the groups. Table 1 presents the educational content and assignments of the sessions. According to the protocol and implementation method of the Ministry of Health and Medicine of Iran, the routine prenatal educational package was held for pregnant women, including nutrition and personal hygiene considerations. Additionally, the experimental group was trained in the routine physiology of nausea and vomiting, along with positive psychology content counseling to reduce the symptoms of NVP. Homework was also assigned at the end of the sessions. In the present study, the usual care was performed for the control group only during pregnancy.

***Table 1: Description of the Content of Counseling Sessions***

| Meeting | Topic | Content of the Meeting | Session Assignments |
|---|---|---|---|
| **First** | Introducing the aim and approach of the study and getting acquainted with the capabilities and using them in a new way | • Familiarizing with counseling courses<br>• Recognizing 24 personal abilities and becoming acquainted with the category of moral qualities and virtues while applying them in a novel way<br>• Teaching pregnancy changes and the physiology of nausea and vomiting, as well as midwifery care training according to the health procedure | Naming some of their abilities and explaining them using the appropriate worksheet |
| **Second** | Introducing the three paths leading to happiness | • Investigating moms' attitudes toward pregnancy and negative pregnancy beliefs<br>• Teaching pregnant women to appreciate delightful image-making from pregnancy<br>• Investigating the causes of nausea and vomiting in pregnancy while describing the symptoms of its severity<br>• Describing the elements that influence the reduction and escalation of these symptoms<br>• Introducing three pathways leading to happiness (pleasure, commitment, and meaning) to reduce pregnancy stress, nausea, and vomiting | 1. Introducing yourself positively<br>2. Completing a questionnaire of values in action (www.viacharacter.org) |
| **Third** | Familiarizing with positive emotions, indulgence, and planting positive emotions | • Thoroughly explaining positive and negative emotions, and their impact on people's lives<br>• Improving mothers' mental and physical skills to alleviate nausea and vomiting symptoms<br>• Explaining the role of positive emotions in improving well-being and quality of life, neutralizing negative emotions, maturity, and prosperity | Improving moms' mental and physical skills to alleviate nausea and vomiting symptoms, as well as writing a thanksgiving diary |
| **Fourth** | Practicing gratitude and forgiveness | • Instructing mothers on how to let go of resentment and practice forgiveness and thankfulness for the problems caused by pregnancy<br>• Emphasizing the significance of forgiveness in enhancing positive emotions and transforming bad sentiments into neutral feelings, as well as its impact on feelings of calm and resilience<br>• Understanding the role of thankfulness in promoting life satisfaction and improving social and marital relationships to reduce negative feeling | Completing assignments on forgiveness and thankfulness |

| | | | |
|---|---|---|---|
| **Fifth** | Practicing positive social relationships, optimism, and hope | • Familiarizing with positive social relationships and their significance in one's life<br>• Boosting pregnant moms' optimism and hope for the future<br>• Providing instructions for overcoming pessimistic attitudes and beliefs<br>• Training to enhance drowning in activities to boost concentration, reduce stress, and improve pregnancy adaptability | Persuading mothers to recall moments in their lives when significant doors were shut, but other doors were opened for them (note one closed and one open). |
| **Sixth** | Providing a general summary of positive psychology | • Assessing mothers' knowledge of positive psychology<br>• Reviewing and summarizing the previous sessions' topics and examining the impact of a positive attitude on pregnancy stress and anxiety | Completing the intervention and Rhode's nausea and vomiting questionnaire |

The present study concentrated on the severity of nausea and vomiting, which was assessed in a follow-up four weeks. The participants completed the relevant questionnaire (Rhodes) before the intervention, immediately, and after four weeks of intervention.

To collect the data, the Rhodes Nausea and Vomiting Severity Scale was used, along with midwifery and demographic questionnaires.

Mothers' age, gestational age, number of births, number of pregnancies, occupation of mother and wife, education, and family income were included in this questionnaire. Moreover, information was gathered on their spouse's education and career.

The Rhodes Nausea and Vomiting Index including 8 questions with a 5-point Likert scale from 0 to 4 was used to determine the prevalence of nausea, vomiting, and gagging in the previous 12 hours. The severity, frequency, and duration of nausea were also included (three questions), as well as the severity, frequency, and amount of vomiting (three questions), and the severity and frequency of nausea (two questions). The total Rhodes scale score was in the range of 0-32. For mild, moderate, severe, and extremely severe nausea and vomiting, the score on this scale was in the range of 3-8, 9-16, 24-17, and 32-34, respectively. The validity and reliability of the questionnaire were confirmed in a study in Taiwan [17]. The Persian version of the questionnaire was confirmed by Nurane et al [18]. A Cronbach's alpha coefficient of 0.89 was used to confirm the instrument's reliability.

The collected data were analyzed by SPSS software, version 16. The desired data were described using frequency, percentage, and mean (SD) indicators. According to the results of the Kolmogorov-Smirnov test, there was a normal distribution of the data. The variables between the two groups were compared by Chi-square and independent t-tests. In addition, the effect of time, group, and interaction between group and time evaluated using repeated measure ANOVA test with controlling the number of pregnancies with a confidence level (CI) of 95%.

As for ethical considerations, the ethics code (IR.ZUMS.REC.1398.436) and the Iranian Registry of Clinical Trials website with the code (IRCT20150731023423N17) was registered. informed consent was obtained from all participants.

## Results

In the two groups, the gestational age was between 6 and 10 weeks. The age range of the majority of pregnant women in the experimental group was 25-30 years and in the control group 30-35 years. The two studied groups were homogenous in terms of age, education, husband's education, job, husband's job, family income, and home ownership, and there were no statistically significant differences (P>0.05). The distribution of pregnant women in the two experimental and control groups was not homogeneous in terms of gravida and there was a statistically significant difference (P=0.035). Most women in the control group were multiparous (73.3%) and in the experimental group were primiparous (53.3%). A comparison of the frequency distribution of two groups based on demographic variables is presented in Table 2.

*Table 2: Comparison of the Frequency Distribution of Demographic Characteristics between the two Study Groups*

| Variable | | Control Group | Experimental Group | Statistics | P-value |
|---|---|---|---|---|---|
| | | Number (%) | Number (%) | | |
| **Age** | 18-20 | 4 (13.3) | 6 (20.0) | 3.486** | 0.323 |
| | 20-25 | 8 (26.7) | 5 (16.7) | | |
| | 25-30 | 5 (16.7) | 10 (33.3) | | |
| | 30-35 | 13 (43.3) | 9 (30.0) | | |
| **Gravida** | Primiparuse | 8 (26.7) | 16 (53.3) | 4.444** | 0.035 |
| | Multiparous | 22 (73.3) | 14 (46.7) | | |
| **Education** | Primary | 5 (16.7) | 4 (13.3) | 5.136** | 0.274 |
| | Secondary | 7 (23.3) | 4 (13.3) | | |
| | High school | 6 (20.0) | 7 (23.3) | | |
| | Diploma | 2 (6.7) | 8 (26.7) | | |
| | University | 10 (33.3) | 7 (23.3) | | |
| **Husband education** | No education | 0 (0.0) | 1 (3.3) | 1.354* | 0.929 |
| | Primary | 2 (6.7) | 3 (10.0) | | |
| | Secondary | 8 (26.7) | 8 (26.7) | | |
| | High school | 2 (6.7) | 2 (6.7) | | |
| | Diploma | 14 (46.7) | 12 (40.0) | | |
| | University | 4 (13.3) | 4 (13.3) | | |
| **Job** | No employee/housewife | 24 (80.0) | 24 (80.0) | 1.200* | 0.912 |
| | Employee | 2 (6.7) | 3 (10.0) | | |
| | Student | 2 (6.7) | 2 (6.7) | | |
| | Other | 2 (6.7) | 1 (3.3) | | |
| **Husband's job** | Government employee | 7 (23.3) | 7 (23.3) | 3.220** | 0.522 |
| | Worker | 6 (20.0) | 7 (23.3) | | |
| | Self-employment | 13 (43.3) | 15 (50.0) | | |
| | Other | 4 (13.3) | 1 (3.3) | | |
| **Family income** | Less than enough | 3 (10.0) | 2 (6.7) | 4.783* | 0.188 |
| | Adequate | 9 (30.0) | 9 (30.0) | | |
| | More than adequate | 11 (36.7) | 5 (16.7) | | |
| | Too much is enough | 7 (23.3) | 14 (46.7) | | |
| **Home ownership** | Owner | 16 (53.3) | 13 (43.3) | 0.5997** | 0.050 |
| | Rent | 7 (23.3) | 15 (50.0) | | |
| | Relatives | 7 (23.3) | 2 (6.7) | | |

*Fisher exact test
**Chi Square

The independent test results showed that before the intervention, there was no statistically significant difference between the control and intervention groups in scores of NVP severity (P=0.421). The results showed that the difference in the mean score of NPV immediately (p=0.014) and 4 weeks later (p=0.031) was significant in the two groups and was less in the intervention group (Table 3).

***Table 3:*** Comparison of repeated measure test results mean scores of NVP in two study groups

| | Mean± SD (before) | Mean± SD (Immediate) | Mean± SD (Four weeks) | Estimated Marginal Means± SE | Repeated measure test | | |
|---|---|---|---|---|---|---|---|
| | | | | | Within subject | Between group | Time * group |
| **Intervention** | 11.60 (2.73) | 5.0 (2.5) | 3.73 (2.50) | 6.61±0.421 | F=23.295 P=0.0001 Eta = 0.290 | F=4.225 P=0.044 Eta =0.069 | F=6.884 P=0.003 Eta = 0.108 |
| **Control** | 11.10 (2.69) | 6.70 (2.80) | 5.30 (3.09) | 7.86±0.421 | | | |
| **P-value*** | 0.421 | 0.014 | 0.031 | | | | |

***Independent t-student, Note. NVP: Nausea and vomiting of pregnancy; SD: Standard deviation**
***repeated measures ANOVA, Mauchly's Test of Sphericity (Mauchly's W=0.738, p=0.001)**

A repeated measures ANOVA was conducted to examine the effect of supportive counseling with a positive psychological approach to improving the severity of NVP. The normality assumption was verified using Kolmogorov-Smirnov test, there was a normal distribution of the data tests. The sphericity assumption was tested using Mauchly's test, which was significant. Therefore, the degrees of freedom were corrected using the Greenhouse-Geisser method.

The trend of changes in the mean score of NPV in groups was investigated using repeated measure ANOVA with the control of the confounding effect of Gravida. The results showed that the changes in mean of NPV are significant in all samples (F=23.295, P=0.0001). The adjusted mean changes of NPV in the intervention group were 6.61±0.421 and in the control group was 7.86±0421, with a mean difference of 0.922±0.599, which showed a significant difference in the two groups (F=4.225, P=0.044). Also, the interaction effect of time and group is significant (F=6.884, P=0.003). It means that there is a significant difference in time changes between groups. In other words, the trend of changes in the mean score of NPV in the intervention and control groups is different. (Fig 2).

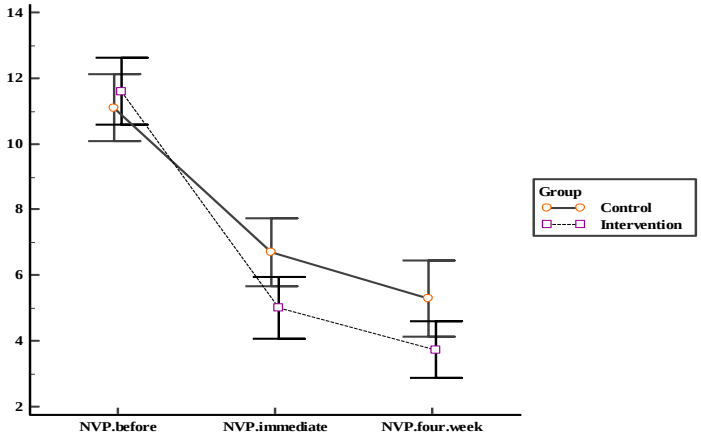


***Figure 2: Changes mean NPV in two Intervention and Control Groups***

Bonferoni's paired comparison test was used following the significance of the mean of NVP in the groups. Results showed that the severity of NVP four weeks after the intervention compared to before the intervention (7.86±0.54) and the severity of NVP immediately after the intervention was significantly lower than before the intervention (6.60±0.54) (p=0.001). The severity of NVP was significantly lower four weeks after the intervention compared to

immediately after the intervention (1.26±0.35) (p=0.004). While in the control group, the results are respectively (5.80±0.47), (4.40±0.40), (1.40±0.26) (p=0.001). The results show that in both groups, we can see the decreasing trend of the mean score of NVP, but the speed of the mean decrease was higher in the intervention group (Table 4).

***Table 4: Paired Bonferroni Comparison Changes in the mean Score of NVP Severity at Different times in two Groups***

| Time1 | Time2 | Control | | Intervention | |
|---|---|---|---|---|---|
| | | MD ±SE | p-value | MD ±SE | p-value |
| before | Immediate | 4.40±0.40 | 0.001 | 6.60±0.54 | 0.001 |
| | Four weeks | 5.80±0.47 | 0.001 | 7.86±0.54 | 0.001 |
| Immediate | Four weeks | 1.40±0.26 | 0.001 | 1.26±0.35 | 0.004 |

## Discussion

According to the findings of the present study, the counseling method based on positive psychology could positively and successfully reduce and improve the severity of NVP at the end of the 4-week follow-up. To the best of our knowledge, this is the first study on determining the effects of positive counseling on enhancing the severity of NVP. Nevertheless, a positive psychological counseling-based intervention could successfully manage vomiting and gastrointestinal symptoms in people with gastrointestinal diseases and until today, no study with this approach had been carried out in mothers, and most of the measures for mothers have been drugs, which have resulted in complications for mothers and since the intervention of counseling has been with a positive approach, mothers were more willing to participate in the meetings. Maleki et al. (2022) study entitled the effect of positive counseling on the Adaptation of women suffering from Nausea and Vomiting of Pregnancy also showed that the adaptation of pregnant mothers has increased [19]. which, like the present study, shows the effect of positive counseling on pregnant mothers. In the study by Feingold et al. (2019), three essential elements were found as the most important regulators of psychological features related to gastrointestinal symptoms, including optimism, flexibility, and self-regulation [20]. Despite the differences between the study populations, our findings are consistent with those of other studies. According to Abedian et al. ( In 2014), there was a substantial reduction in the severity of NVP among the mothers in the experimental group receiving telephone support counseling compared to the control group [21], which is in line with our results. However, Chitapanarux et al. revealed that a telephone supportive counseling session was not effective in improving the symptoms of radiotherapy-induced vomiting and nausea [22]. This inconsistency can be related to the differences in the research population and the consulting approach type. Based on the literature, positive counseling in the research population of pregnant women and the postpartum period could effectively improve other variables such as an increase in the happiness score in women with unwanted pregnancies [23], the success rate of pregnancy, and the resilience of infertile women [24].

Mostafaei et al. (in 2020) indicated the positive effects of counseling with a positive approach on the psychological capital and quality of life of women pregnant [16]. Nikbakhsh et al. also stated that the severity and frequency of NVP were significantly and directly associated with depression and anxiety in pregnant women. The improved mothers' mind peace was related to reduced symptoms [25]. Thus, the efficacy of this approach is demonstrated in enhancing different psychological aspects of childbirth and pregnancy, which policymakers and researchers in the field of maternal health should consider. This finding is also supported by Corno et al., who found reduced depression by implementing a web-based positive psychology intervention during pregnancy while enhancing positive attitudes regarding optimism and pregnancy [26]. Their findings conform to our results, revealing that the incorporation of psychological care within the prenatal care package can be considered an

effective treatment technique by health care practitioners.

Our findings regarding NVP reduction are in conformity with those of other counseling methods. Sangestani et al. reported that family-oriented counseling could beneficially reduce the severity of NVP in first-time mothers [27].

Likewise, Saeedi et al. found that the severity and frequency of NVP were reduced by combining psychological counseling with couples treatment and acupressure training in the intervention group compared to the control group [28]. Isbir et al. also concluded that the length and severity of NVP were decreased by pregnancy counseling [14]. Their results on the severity of vomiting and nausea are in line with our findings.

The limitations of our study were utilizing a self-report questionnaire, facing the COVID-19 epidemic, and including only female volunteers with mild to moderate nausea and vomiting in counseling sessions it would have been better if women with severe nausea and vomiting were also included in the study. Despite these limitations, it is proposed that future researchers perform similar studies to be able to generalize the results.

## Conclusion

Our findings revealed that this supportive method of counseling based on positive psychology is effective in reducing and even improving the severity of NVP and the effects of this method continued even until the follow-up ended four weeks after the intervention.

Furthermore, due to the relationship between mental and psychological factors with the severity of NVP in this period of life, it is suggested to promote the mental and physical health of mothers and their babies, this supportive approach of positive psychology, which is a safe and non-pharmacological method. Educational packages with positive counseling content should be presented to mothers in this era.

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## Conflict of interest

The authors declared that they have no conflicts of interest.

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## Authors' contributions

The conception, design of the study, and data collection process were undertaken by M.A. A.M. was the supervisor who also contributed to the conception, design of the study and reporting of the results. L. E and B.M as the Advisors that contributed to all the stages of the study. Analysis, interpretation, and reporting were supervised by A.M. All authors contributed to the drafting and revising of the article and agree with the final version of the manuscript to be submitted to the journal; they also meet the criteria of authorship.

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