Effect of Antenatal Educational Package on Primiparous Women's Knowledge and Practices for Prevention of Selected Aspects Postpartum Complications

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Abstract:

Background: Postpartum period is highly critical, as mothers are vulnerable to hazards and most of sudden emergency and life threatening complications occurs during this period. If the mothers received an effective care, their mortality and complications will be reduced. So, mother's knowledge and education before childbirth regarding postpartum complications and ways of its preventions are important. **Aim of the study:** Focused to evaluate the effect of antenatal educational package on primiparous women's knowledge and practices for prevention of selected aspects postpartum complications**. Research design:** A quasi experimental design was used. **Setting**: On antenatal and postnatal departments at Zagazig University hospitals. **Subjects:** A purposive sample composed of 100 primiparous women divided into two groups (intervention and control). **Tools of data collections:** Three tools were used as: **Tool I:** Interviewing questionnaire. **Tool II:** Self-structured knowledge questionnaire and **Tool III**: An observational checklist regarding selected practices to prevent some of postpartum complications**. Results**: It was observed that after applying the educational package there was a highly statistically significant difference between the means of total score of knowledge and practice in intervention group than those in control one throughout the study phases. Moreover, the control group had a high percentage of postpartum complications than the intervention group with no statistical difference. **Conclusion:** It was evident that the educational package was effective in enhancing knowledge and practice where, the intervention group had higher score than the control, also had a significant reduction in the occurrences of postpartum complications than those in the control. **Recommendations:** It is mandatory to establish a comprehensive training intervention for primiparous pregnant women at MCH centers to enhance their knowledge and practices on postpartum complications and methods of preventions which can reduce the maternal morbidity and complications.

Keywords: Antenatal educational package, Primiparous women ,knowledge, practices prevention of postpartum complications .

Introduction:

Postnatal period which also known as puerperium is a crucial time in the life of any woman that requires a special care starting from pregnancy and continuous during delivery and after delivery to prove safe motherhood and healthy living (1) . Puerperium is strictly defined as the period of confinement during and just after birth as it is starts from the delivery of placenta and continues for nearly 6 weeks. The postpartum period is divided into 3 categories: the immediate postpartum (first 24 hours), early postpartum (first week) and late postpartum (second to sixth weeks) (2).

The postnatal period is a highly critical, where most of maternal and newborn mortalities occur during this time. Despite its importance it is the most neglected period for providing quality services as it has received

relatively less attention compared with antenatal and intranatal period. The lack of care may be most life threatening, since this is the time when sudden emergency complications are most likely to occur [3] .The postpartum period is the period when women adjust physically and psychologically after the delivery of the baby., During these period the women's body and reproductive system restored to the pre-pregnant status both anatomically and physiologically triggered by a sharp drop in the levels of estrogen and progesterone produced by the placenta during pregnancy [4] **.**

At some stages some of these well-orchestrated changes can go away resulting in undesired complications which can threaten the mother's life. Some of them are; puerperal pyrexia and sepsis, uterine sub involution and haemorrhage,, urinary tract complication, challenges of breastfeeding and breast complication as mastitis, inverted ,flatted or soreness nipple and breast engorgement. Additionally , perineal trauma, either spontaneous laceration or an intentional cut which is common after vaginal birth and associated with pain that interfere within women daily activities, puerperal venous thromboembolism (VTE), which may manifest as pulmonary embolism (PE) or deep vein thrombosis (DVT), and psychiatric disorder occurrence by being vigilant [2]**.**

As known the prevention is always better than cure, following aseptic techniques during delivery with a removal of any retained parts of placenta, using a prescribed antibiotics for cesarean delivery and for the case of prolonged rupture of membranes, providing an instruction regarding perineal hygiene and comfort measures, giving information's concerning to the successful and frequent breastfeeding, following the standards of care and intervention which prevent life-threatening complication and providing timely and high-quality post-delivery care are essential for prevention or minimizing the development of several complications [5] .

During the postpartum period, women experience physiological changes, which can have negative impacts on their quality of life. Women's knowledge regarding postpartum complications and care can help them successfully pass of this critical period. Firmly, the maternity nurses guide and assist women throughout their pregnancy and puerperal period. As she has crucial role in the quality of antenatal, perinatal and postnatal care improvement, which provides the woman with advice, instructions, education, counseling, support and appropriate referral in order to improve their outcomes and reduce the incidence of potentially life threatening complications of postpartum period [6] .

Effective education provides the childbearing women with sufficient knowledge, practices and self-care strategies that meet their health needs , promote wellness, prevent illness, regain health , prevent hospitalization and to seek assistance if necessary. As a part of postpartum care, the mother will need a variety of healthy instructions regarding perineal care, comfort measures , prevention of infection, fundus checking, important of early immobilization after labor , as well as a good technique and early initiation of breast feeding**[7]** . So, nurses should educate the mothers about these interventions which will help them in gaining knowledge and maintaining a positive health for herself [8].

Significance of the study:

Postpartum period is a period of risk and the harmful practices regarding postnatal care were prevalent among mothers. In spite of a decline in the rate of maternal mortality or morbidity as compared to the olden

times, their incidence is still and nearly 11-17% of maternal deaths happen during child birth itself [9]. The WHO recommends providing skilled care during pregnancy, childbirth, and postnatal to decrease this rate. Furthermore, up to third of these deaths will be prevented by increasing education times through intervention for mothers and practiced effective measures for self-care after birth. Also, on the basis of scientific principles, that focused on the importance of providing knowledge and practice sharing between maternity nurses and women a nursing education should be applied. Thus educational actions become transformed and build a potentiating strategy of nursing care in pregnancy and childbirth. So, the present study had a genuine interest to evaluate the effect of nursing educational package for primiparous women regarding the prevention of selected aspects for postpartum complications

Aim of the study:

The present study was aimed to evaluate the effect of antenatal educational package on primiparous women's knowledge and practices for prevention of selected aspects postpartum complications

Objectives:

- Recognize the level of existing knowledge and practices of primiparous women in both groups for the prevention of some postpartum complications (pre, post, follow-up).
- Design, implement and evaluate the effectiveness of educational antenatal package on primiparius women knowledge and practice for the prevention of some postpartum complications
- Determine the effect of antenatal education on the occurrences of postpartum complications for women in both groups.

Research Hypothesis:

H1: Primiparous women who receive antenatal educational package will have higher level of knowledge and have a good practices than those who don't receive the package.

H2: Primiparous women who received an antenatal educational package will have a significant lower reduction in the occurrence of postpartum complications than those who do not.

Study Design:

The present study was designed as a quasi-experimental design (pretest/posttest). A quasi-experimental research design attempt to determine causal relationships by applying a treatment or condition to one group (intervention) and comparing the outcome with a control group ***Polit & Beck., [10].*** In the current design, subjects are assigned to either intervention or control group. The baseline measures of the dependent variables were performed for all subjects. Then subjects in the intervention group only received the proposed intervention. After that, all subjects were post-tested to measure the degree of change in the dependent variables ***Flannelly, et al.,*** [11]***.*** The study group followed the educational package, while the control group was subjected to routine hospital care.

Study Setting:

The study was conducted at antenatal and postnatal wards at Zagazig University hospitals. The University Hospital has a key role in providing of free and paid services for women during pregnancy, labour and postnatal periods in additions to fertility and gynecological care.

Study subjects:

Sample type: Purposive sample.

Sample size:

The sample size was calculated using the EPI info package (Epidemiological information system) software version 6.04. Assuming that a good practice level among studied women at post intervention program

was 61.7% and 36.7% among control group, ***Abd Elhakam and Abd Elmoniem*** [12], at confidence level is 95% two side with power of study 80% with drop out cases 10%. .Sample size is 50 women in each group. The women were then randomly assigned to two equal groups (intervention and control group). The two groups were chosen to be partially similar in every respect as regards their demographic characteristics and this was quite important to be able to compare the outcomes in the two groups without biases or confounders. The control group were included the first 50 mothers who received the routine hospital care, while the next 50 mother were included in the study group who received the educational intervention who met the following inclusion and exclusions criteria.

Inclusion Criteria:

- literate women in age group of 20-40 years
- Third trimester primiparous women who had singleton, viable fetus without any congenital anomalies and agree to participate in the study.
- Women had any medical complications were **excluded** from the study

Instruments of data collection:

The pregnant women were interviewed by using the following three tools which were developed and modified by the investigators after extensive reviewing of related literature guided by ***(Aneesha et al., [13], Greer et al., [14] & Queensland Clinical Guidelines, [15])*** and written in simple clear Arabic language**.** It was applied to all studied women in both groups before (pretest) and after (posttest) implementation of the educational package

Tool I: A designed structured interviewing schedule that comprised of two main parts:-

Part 1: This was concerned with pregnant women's general characteristics' such as age, level of education, occupation, residence and telephone number. In additions to previous women information regarding postpartum complications and the source of this information.

Part 2: This was covered current pregnant women's obstetrical history as duration of gestational age and mode of current delivery.

Tool II: Self-structured knowledge questionnaire with (pre/post and follow up test) and consists of 30 items in the form of multiple-choice questions for assessing knowledge of pregnant mother regarding some of postpartum complications and prevention of them which categorized into eight types of complications as follows: perpeural sepsis, breast engorgements, cracked nipples, flat nipple, deep venous thromboembolism, caesarean section surgical site infection, episiotomy pain, and postpartum depression. As well as, three questions regarding periperuim and postnatal danger signs. The main question related to each problem was focused on definition, time of occurring, causes, clinical manifestations, complications, treatments, method of preventions and healthy precautions during post natal period.

Scoring system for knowledge part.

Mother's answers related to knowledge were scored and calculated; each correct answer was given a score of one mark and incorrect answer or any women who didn't know the answer a score of zero was given respectively with minimum score of zero and maximum score of 30. Knowledge level was considered satisfactory at cut of point ≥ 60% and it was considered unsatisfactory at < 60% based on statistical analysis.

Tool III: An observational checklist. It was adapted from

(Ostendorf et al., [16], Royal Australian and New Zealand College of Obstetricians and Gynecologists', [17], Queensland Clinical Guidelines, [18] and Nabulsi et al., [19]) and modified by the researchers to assess pregnant women's practices for the prevention of some postpartum complications(pre and post the intervention).The selected practices were applied on educational model and was concerning to (perineal and episotomy care, , leg and foot exercise for DVT prevention , proper breast feeding technique and the care for inverted and flat nipple by using syringe technique). It contains 33 steps

Scoring System:

The scoring system was developed by the investigators and the possible response for each step in observational checklist was done or not done. The scores given for each were 1 and zero respectively and the total score of practice was thirty three marks. The percentage of all score was calculated and the total score of mother's practice was classified as follows: Mothers performance was considered satisfactory when the total score was 60% and more and unsatisfactory when the total score is less than 60%.

Tools Validity and Reliability:

The designed tools and educational package were validated and reviewed for comprehensiveness, suitability, and legibility by three panel expertise's in the field of Obstetrics and Gynecology (two professors from nursing and one from medicine). They were modified according to the panel judgment on the clarity of sentences, appropriateness of content, the sequence of items, and accuracy of scoring. The reliability was done by Cronbach's Alpha coefficient test which revealed that each tools used consisted of relatively homogenous items. It was 0.824 for women knowledge and 0.807 for practice which indicates an accepted reliability of the tools.

Pilot Study:

A pilot study was carried out on 10pregnant women representing about 10 % of the total studied sample, for assessing the applicability, feasibility and clarity of the of the tools used in the study for data collection . Also for estimating the exact time needed to answer the questions and to ascertain the relevance and content validity of tools. All participants received a clear clarification for the study purpose. The mothers enrolled in the pilot, were included in the main study sample as there were no modifications done on the data collection tool.

Field work:

Upon securing all necessary official permission obtained from the responsible authorities at Zagazig University Hospitals, the researcher visited the previously mentioned study setting and met the pregnant women who were willing to participate in the study according to the eligibility criteria and explained the study objectives with assuring about the confidentiality of the data and taken their written acceptance as well as to gain their cooperation. After the women's finishing their checkup and follow up visits at the antenatal clinic they were met 3 days per week(Saturday, Monday and Wednesday) by the researchers where these days were specified for pregnant women follow up from 9:00 am. To 1 pm. The current study was carried out from the beginning of October 2021 up to the end of May 2022 for a period of 8 months. The study was conducted through four phases: preparatory, planning, implementation, and evaluation.

Preparatory phase:

This phase was concerning to construction of the study tools and designing of educational package based on extensive, recent and appropriate literature review which

was written by simple Arabic language and included pictures for more illustrations to simplify women's understanding. The investigators selected women who were recruited and assigned randomly to two equal groups (50 women per each). The first group (the control group) which received the routine hospital cares while the second(**study group)** was interviewed individually by the researchers in the ante-natal clinic with maintaining the privacy and following the protective measures against covid 19 to assess their knowledge and practice by using pretest interviewing questionnaire and checklist. The time consumed for completing the questionnaire and checklist was ranged from 30 to 45 minutes.

Planning and implementation phase:

On the basis of identified women's needs which obtained from the pilot study and assessment phase the educational package was developed by the researchers and theoretical and practical part which was distributed over 9 consecutive sessions. **The first session** was about the orientation to the educational intervention like the rationale and importance of the subject. **Second and third session**: It covered knowledge related to peruiperuim and some of complication which encountered on it as peruperal sepsis and breast feeding problem • **Fourth and fifth session**: It covered knowledge about cesarean section site infection , perineal infection and postpartum depression and the last four sessions were for the practical part and posttest assessments. For the practical sessions each procedure was demonstrated on a model. Each session started with a summary of the previous session and the objectives of the new one. The duration of each session took about 45- 60 minutes depending upon the women's physical, mental readiness and other circumstances in the study settings. The attended number of women in each session were about 5-6 women, motivation and reinforcement during a session were used in order to enhance women's' learning and understanding. Teaching methods were selected to suit teaching in small groups in a form of group discussion, demonstration and re-demonstration. Additionally the practical intervention was aided by using suitable teaching methods as power point presentation, videos films, pictures, lab models as infant model which was used to train mothers on correct technique of breast feeding, breast model for the training on syringe technique for flat/ inverted nipple and episiotomy model for perineal and episiotomy care. Each mother re-demonstrated the skills individually. An educational package was distributed among pregnant women at the end of last session.

Evaluation Phase:

In this phase every woman of the studied sample (control and intervention group) was interviewed immediately after implementation of the educational package (posttest) and also before the discharge from the hospital by using the same tools of pretest for the (follow up phase). Additionally, the women were followed by telephone within 3- 10 days after delivery about the presence of any postpartum complications and offered proper referral to obstetricians' outpatient clinics.

Administrative and ethical considerations:

Official permission was obtained from the responsible authorities at Zagazig University Hospitals (directorate of outpatient clinics and directorate of maternity hospitals) based on letters from Faculty of nursing explaining the aim of the study and the nature of tools used for data collection as well as the expected outcome from implementation of the study .The present study research was approved by the Research Ethics Committee (REC) of the Faculty of Nursing at

Zagazig University and all ethical issues were taken with considering in study. Sign a consent form before starting the data collection was obtained from the women after full explanation of the aim and objectives of the study as well as its procedures. The participants were informed that their involvement in this study was voluntary and they have the rights to refuse or withdraw from the study at any time. Additionally, they were assured that data were kept confidential and the anonymity was maintained by assigning a code number to each one instead of names to protect their privacy. They were also assured that any obtained information would be used only for research purposes.

Statistical analysis:

All data were collected, tabulated and statistically analyzed using (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.2015).. Quantitative data were expressed as the mean ± SD & median (range), and qualitative data were expressed as number & (percentage.). Mann whitnney u test was used to compare between two groups of non-normally distributed variables. Wilcoxon sign rank test was used to compare two dependent not normally distributed variables. Paired t test was used to compare two dependent normally distributed variables Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate.MC Nemar test was used to compare two dependent categorical variables . Pearson correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. Multiple linear regressions are a predictive analysis. Simple linear regression is used to describe data and to explain the relationship between one dependent continues variable and one independent variable. All tests were two sided. P-value < 0.05 was considered statistically significant and p-value ≥ 0.05 was considered statistically insignificant.

Results:

Table 1: shows that 62% & 58% respectively of Primiparous women in study and control group were in the age ≥22 years with a mean age of 25.3±5.3& 22.8±3.3 respectively. Meanwhile, 64% & 72% respectively were had a secondary education. As regards to residence, the same table reveals that 90% & 82% respectively of both groups were subjected from rural area. As for the previous knowledge regarding postpartum complications, it was found that only 30% &26% respectively of the Primiparous women had a previous knowledge and the internet was the most common source in 14% & 12% respectively.

Regarding the obstetrical data**, table 2** clarifies that 56.0% & 54.0% of Primiparous women in study and control group were had gestational age from ≥ 35- 36 weeks respectively. Concerning to the mode of current delivery, it was obvious that 62% & 52% of both groups were delivered normally.

Table 3 shows non statistical significance difference of Primiparous women knowledge regarding the periperium for both groups during the study phases, meanwhile there was statistically highly significant difference of pregnant women knowledge in intervention group regarding danger signs of periperuim and regarding the knowledge of all selected aspects for postpartum complications throughout the study intervention. The analysis of findings reveals that the all items regarding knowledge of (puerperal sepsis, breast engorgements', cracked nipples, inverted nipple, DVT, PPD) were

improved in post and follow-up intervention than pre intervention.

Total mean of Primiparous women's knowledge regarding postpartum complications for both study and control group was reported in **table 4** ,the table reveals that the mean score was improved in post and follow-up study phase than pre phase with highly statistically significant in intervention group than those in control one.

Total knowledge score for study and control group throughtout the study phases was portrayed in **figure 1,** it was illustrated that 14%&12% of studied mother in both groups had satisfactory knowledge before implementation of the educational intervention and this percentage was increased to 80% & 18%respectively in post intervention and slightly decresed to 76% & 14% respectively at follwup phase with statistically significance.

Table (5) illustrates comparison effect of intervention in practice between study & control pre and post intervention. With non-significance difference pre intervention between study & control groups (P>0.05). But there were highly significance difference (P<0.001) post intervention in each item of practice regarding perineal care, syringe technique for the care of inverted or flat nipple, leg and foot exercise and breast feeding

Table 6 compares pre and post of pregnant women's practice mean score among study and control group, it was displayed a highly statistically differences between total mean of pregnant women's practice in both groups throughout the two phases of interventions (pre& post).

Figure 2 demonstrates total practice score for both groups through the intervention phases. It was found that 18% &14% of study and control group respectively were had a satisfactory level of practice pre intervention , meanwhile these percentage was increased to 78% at post intervention for the study group and the control group percentage was 16% with statistically differences'.

Table 7 indicates the postpartum complications encountered for both groups it was reported that 6% & 16 % of the study and control group had complications and postpartum depression was the most common one (4% & 8% respectively followed by breast engorgements (2%&6% respectively) with non-statistical differences.

Table 8 depicts no significance with negative correlation between pre intervention knowledge score with pre practice score. Meanwhile, there was highly statistical positive correlation between post knowledge score with post practice score r =0.743, p = 0.0001

As regards the predictor for post-practice score among the study group, **table 9** indicates that post knowledge score was a highly statistical significance independent predictor. The model explains 55% of predictors in this score.

Discussion

Childbirth is a joyful experience for many women but, unfortunately, it can be a difficult period bringing with it new problems that are laid down during pregnancy and childbirth. The childbirth-related sufferings make an important part of the ill-health and death of the world **(Gamel et al., [(20)]**. Puerperium is a time of great importance. It is an aspect of maternity care that has received relatively less attention compared with pregnancy and delivery. Many troubling complications' arise shortly after childbirth. Thus educational actions become transformed and build a potentiating strategy of nursing care in pregnancy and childbirth.

The general characteristics of the study subjects in the current study was correlate as expected with the middle class of Egyptian society where, more than half of pregnant women in study and control group were in the age ≥22 years with a mean age of 25.3±5.3& 22.8±3.3 years

respectively. Meanwhile, three quarter were had a secondary education and most of both groups were housewife and subjected from rural area. These findings were come in accordance with (Hassan et al., 2019) who found the mean age of their participants was 23.25 ± 5.75 years, and two fifths of them had secondary or technical education and most of them were housewives. Also, the foregoing present study finding is in the partial agreement with **Gamel et al., [20]** who found more than half of the women were in mid-age and one-third had secondary school education and The majority of the participants were housewives and resident from urban area. Analyzing these data may help to understand and/or justify the prevalence of forthcoming results of the present study.

One third of both studied groups in the current study had previous knowledge regarding postpartum complications and it was striking to find out that health professionals (physicians and nurses) had the least rank as a source of knowledge and the internet was the most common source. This may be attributed to some gap of communication between health professional and the mothers. Additionally, most of mother was educated and had smart phone with internet connection which help them for search**.** This finding in partial agreement with **Bayaskar., [21]** who mentioned that the most common source of their participant knowledge was getting from mass media and the health professional was the less common source.

Antenatal education for Primiparous women during the third trimester of pregnancy is very important to avoid or decrease the incidence of complications during antenatal, intra natal and the postnatal period. On other hand, the awareness of the mothers towards postpartum complications had a lot of lacunae. So, there is scope for improvement by providing better care and health education for antenatal mothers at primary care **(Menaka, [22]).**

Our main target in the current study was to assess the pregnant women knowledge regarding selected aspects of postpartum complications; the study findings demonstrate deficiencies in the women's knowledge in pre implementation among the study participants. Meanwhile, there was a highly significant improvements were evident in all variables of the knowledge after the implementation of the educational package especially for the intervention group than the control group. This finding clarifies the research hypothesis justification and shows that the educational intervention was effective.

Puerperal sepsis is a common pregnancy-related condition that could eventually lead to obstetric shock or even death in some cases. In developing world, it has been reported that puerperal sepsis is the second most cause of maternal mortality **(Sultana et al., [23]).** Respecting the evaluation of the studied mother's knowledge regarding the studied items of puerperal sepsis, the results of the present study revealed a highly significant enhancement of the participants' knowledge in intervention group than tne control one after educational intervention compared to before intervention, where the majority of them had satisfactory knowledge after educational package intervention .This finding is consistent with **Gamel et al., [20] and Masoud & Saber ., [24]** in Egypt in their studies which reported a significant improvement of the studied women knowledge regarding most of the studied items in relation to peureperal sepsis after introducing the educational guidelines compared with before intervention p<0.000**.**

Mothers during pregnancy and postnatal period had knowledge deficiency regarding care of breast and proper breast feeding techniques.

Following these deficiency of knowledge, several breast problems may be found during postnatal period as cracked or inverted nipple, latch-on problems, breast engorgement and breast infection. Furthermore, lactation suppression may be arisen as a result of these breast problems **(Tiwari *et al.,* [25]).** As for the assessing of the studied women knowledge in study and control group regarding breast problems as engorgement, cracked and inverted nipple, the current study indicated that women had lacked basic knowledge regarding breast complications as a few percentage of the studied women had a satisfactory knowledge pre intervention, and these was changed post applying the educational package as the majority of them had satisfactory knowledge with significance improvement during the study phases. This deficiency of knowledge may attribute to the fact that all of the participants were primiparous who usually lack knowledge and experience in motherhood crafts. The previous finding indicates that educational package was effective for the enhancement of knowledge and there was a great need to design and implement of such educational instructions

The above mentioned results were In the same line with **Varghese & Patwa .,** [(26)] who reported that the majority of their participants had inadequate knowledge in pretest but in the post-test only 10% had inadequate knowledge regarding the management of breast engorgement. Additionally, **Bayaskar,** [(21)] who mentioned that the knowledge score of their participants shows a marked improvement after giving planned teaching intervention about the prevention and management of selected breast complications of antenatal mothers where the pretest the mean of the knowledge score was 10.40 and it increased to 19.20 in the post test. This also agreed with the study done by **Kareem et al.,** [(27)] In Egypt in their study about the "Effectiveness of Teaching Program on Knowledge Regarding the Breast Feeding Problems among Postnatal Mothers" who stated that more than half of their participants had poor knowledge preprogram regarding knowledge on breast engorgement, cracked nipple, breast mastitis, breast abscess and inverted nipple but post program the majority had good knowledge with highly statistically significance.

The risk for DVT was increased approximately 20-fold at the pueriperuim period where 80% of the changes occur in the first three weeks postnatal as a result of pelvic cavity trauma. On other hand, Deep-vein thrombosis is a preventable disease and the serious complications of it can be reduced when raising awareness and education among pregnant & labouring women **Youness et al*.,* [(28)].** Concerning to the assessment of the current study women knowledge in both groups before and after of the implantation of the educational package , the present study findings revealed that a few percentage of women in study and control group had a satisfactory knowledge regarding DVT and its manifestations in additions to its prevention pre intervention with non-statistical significance meanwhile, after implementation of the intervention there was an enhancement in level of knowledge with highly statistically significant difference between them where most mothers in study group had a satisfactory knowledge in post and follow up phase than control group. This finding with parallels with **Elsabagh ,** [29] and **Ramadan et al.,** [30]) in Egypt who detected a considerable improvement in their participants knowledge in post intervention than pre with a highly statistical significance difference for the study and control regarding DVT knowledge and this difference in might be related to the knowledge acquired from the intervention. Also this is partially

similar to **Green & Bernhofer** [31] who stated that a higher level of knowledge scores was in the experimental group where less than two fifths of them had correct answer before the intervention and these was rising to less than three quarters in post intervention

As a result of episiotomy child birth women may have a perineal pain and feeling physical discomfort, hence the maternity nurse should teach the Primiparous women self-post pregnancy care to maintain a good postpartum health, furthermore, C-Section is the most commonly performed surgical procedure in the world and it's increasing rate around the world is really "alarming" **Michaeleen,** [32]**.** On other hand, knowledge about the women's post cesarean practices helps to avoid identified factors that contribute to the presence of wound infection and comprehend the importance of effective post CS wound care **(Peter,** [33]**.** The current study results revealed that the majority of studied women had unsatisfactory knowledge regarding the Caesarean section surgical site, perineal pain and its prevention among study and control group and the overall mean score of knowledge were improved in pretest than post and follow-up tests with a highly significant difference after the implementation of the educational package. This were come in accordance with **Praveen et al.,** [1] who reported that mean post-test knowledge scores in the experimental group was higher as compared to the control group where nobody in both groups was having good knowledge at pre intervention meanwhile Post-test results showed that women in the experimental group were having very good knowledge than mothers in control with a significant difference at three different times of interval.

The present study results revealed that the overall mean score of knowledge related to the selected aspect of postpartum complications for both groups was improved with a highly significant difference after the implementation of the educational package. This result demonstrates the success of the educational package, clarity and consistency of the educational tools that used by the researchers .This goes in line with a study by **Kareem et al.,** [27] in Egypt who illustrated a significant improvement in the level of knowledge post program as compared to preprogram where the majority of their participants had good knowledge post intervention of educational program .Similarly, **Padmasree et al.,** [34] they reported that the mean post-test level of knowledge was 20.76±2.69.in experimental group compared to 10.03± 3.23 in control group with statistically differences in pretest and posttest knowledge score which shows that informational booklet was effective for increasing knowledge. Additionally, **Patil et al.,** [35] who found a significant rise in primi postnatal mothers knowledge after the intervention where the mean score of total knowledge at pretest was 9.96 ± 2.75 compared to 17.64 ±2.49 at posttest.

Practices of mothers regarding the prevention of postpartum complication are lagging in many aspects and to overcome of these deficiencies the overall knowledge of mothers should be raising by providing a health education and discouraging the unhealthy practices . One of the most important aspects of maternity care is providing accurate and consistent advice on how to prevent complications and, if occurs instruct women how to overcome it .Therefore, Assessing of women selected practice for the prevention of some postpartum complication was another research objective in the current study, it was revealed statistical enhancement in women practice post intervention than pre where the majority of women in the intervention group had satisfactory practices after educational package intervention than the control group regarding to perineal care, syringe

technique, leg and foot exercise and correct technique for breast feeding. This improvement of women's practice especially in intervention group than control group revealed to the acceptance of research hypothesis and demonstrates that the educational nursing intervention was effective.

Integrated approach as self-perineal care which had a positive effect in reducing the perineal pain and enhancing the wound healing , encouraging women in preforming leg and foot exercise that promote women safety regarding the prevention of DVT in additions to self-assessment and reporting of DVT symptoms and advising of correct breastfeeding technique to ensure successful breastfeeding and decreasing of breast problems would reduce the maternal morbidity and mortality during the postnatal period. According to findings of the current study there was a statistically improvement in the percentages of satisfactory practices of studied groups related to selected practices of postpartum complications after the educational intervention. This finding in accordance with a study of **Ramadan et al., [30]** in Egypt who mentioned statistically significant differences between the study and the control groups considering the performance of DVT preventive measures after implementation of the intervention. furthermore**, Hassan et al., *[36]*** in Egypt who revealed a significant improvements in their participant women in the study group regarding the good technique of breast feeding compared with those in the control group. Also, **Praveen et al., [1]** found the mean of post-test scores in the experimental group was higher than the control group regarding the practice of self perineal care with a significant difference which clarifies the effectiveness of intervention.

With regard to answering the current study hypothesis that the pregnant women who receive nursing educational package will have higher level of knowledge and have a good practice on posttest than pretest. The present study hypothesis has been achieved to a high degree, where the results of the current study indicated a statistically significant improvement in total knowledge and total practice scores where the majority of studied group had unsatisfactory knowledge and practice in pretest which changed minority at immediately post and follow up of intervention respectively especially in intervention group meanwhile the level of knowledge and practice for the control group remain unsatisfactory at posttest. From the researchers' point of view, these improvements may be the result of the educational package given to women. In additions to women enthusiasm for participation in the educational sessions and their readiness for future attendance for the sessions. This findings in agreement with **Ramadan et al., [30]** and **Green & Bernhofer *[31]***who mentioned that there was no statistically significant difference was found between study and control group regarding knowledge and practice score before the intervention meanwhile, the higher level of scores was found in the experimental group than control group with a statistical differences at post intervention .

As for the postpartum complications occurrence for both study groups, the present study revealed that the control group had a high percentage of complication than the intervention group where nearly more than one fifth of control group encountered complications compared to 4% in study group. This show a remarkable decrease in the incidence of postnatal complication in the study group and this may be due to the knowledge and skills which acquired from the educational package in addition to women keening for acquiring the skills and knowledge that will prevent postpartum complications.

The previous mentioned finding are in line with **Ramadan et al., [30]** in Egypt revealed that the knowledge

and skills which acquired from the educational intervention leads to no one case in the intervention group had a complications compared to less one tenth in control group. Furthermore**, Padmasree et al., [34]** who illustrated that the incidence of postnatal complication was higher in control group than the intervention group (63.3% &13.3% respectively). Additionally, the current study was partial agreement with **Youness et al., [28]** who mentioned that the intervention group who received the educational program and followed the nursing instructions were significantly had a lower complications than those who received the routine hospital . This finding was also supported by **Mohamed et al., [37]** who found that implementing the designed nursing guidelines was decrease the incidence of complications in the group followed by guidelines. Moreover, **El-Sayed Ead et al., [37]** demonstrated that, there was decrease in all items related to the signs and symptoms of DVT in the study group than in the control group during and after one month from discharge and with statistically significant differences observed as ($P \leq 0.001$ & $P<0.05$) **.**

In multivariate analysis, the present study stated that there was positive correlation between total knowledge and total practice scores. This because improve knowledge has good effect on improve practice and there is direct relation between knowledge and practice. On the same line **Thaiba & Rani , [39] and Ahmed et al., [40]** who found a positive correlation between total knowledge and practice among postnatal mothers. Also this finding is partial agreement with **Praveen et al., [1]** who found statistically significant association between knowledge and practice where the higher score of knowledge will associated with higher score of practice.

Conclusions:

According to the results of the current study, it was concluded that primiparous women who subjected to the educational package had a higher level of knowledge and had a good practices than those who did not receive, where, the level of satisfactory knowledge and practices at post and follow-up phases were significantly higher as compared to pre-test and this proved the first research hypothesis .Also, the current study revealed a significant decrease in the occurrence of postpartum complications especially for the intervention group than those in the control group and this proved the second research hypothesis.

Recommendations:

In the light of the study findings, researchers recommend the following:

- It is mandatory to establish a comprehensive training intervention for primiparous pregnant women at MCH centers to enhance their knowledge and practices on the different aspects of postpartum complications and ways of preventions which can reduce the maternal morbidity and complications.

For further research:

- At the antenatal care units it is required to conduct a training health intervention regarding postpartum complications and how to prevent for maternity nurses in order to educate the women about postpartum care, which is a crucial aspect of women's health and help to reduce maternal complications.
- To strength and generalize the findings further researches and similar studies in other places and on a larger sample size are still needed.

Table 1: General Characteristics and Previous Knowledge in Study& Control Group (Each Number Group=50)

Variables	Studied groups				χ^2	p-value
	Study group n= 50		Control group n=50			
	No.	**%**	**No.**	**%**		
Age(years)						
20- <22 years	19	38.0	21	42.0	0.17	0.68
≥22 years	31	62.0	29	58.0		
Mean ±SD	25.3±5.3		22.8±3.3			
median(range)	22.5(20-35)		22.5(20-32)			
Education level						
Primary	10	20.0	8	16.0	0.74	0.69
Secondary	32	64.0	36	72.0		
University	8	16.0	6	12.0		
Occupation						
Housewife	41	82.0	42	84.0	0.071	0.79
Working	9	18.0	8	16.0		
Residence	.	.				
Rural	45	90.0	41	82.0	1.3	0.25
Urban	5	10.0	9	18.0		
Any previous information's regarding postpartum complications:						
Yes	15	30.0	13	26.0	0.19	0.66
No	35	70.0	37	74.0		
Source of these information						
Health care provider	3	6.0	3	6.0	0.045	0.79
Relatives or family	5	10.0	4	8.0		
Internet	7	14.0	6	12.0		

$\chi 2$ = Chi square test non-significant p>0.05

Table 2: Current Obstetrical Data for Both Groups (Study& Control) n= 100

Variables	Studied groups				χ^2	p-value
	Study group n= 50		Control group n=50			
	No.	**%**	**No.**	**%**		
Current gestational age						
30 <35 weeks	22	44.0	23	46.0	0.04	0.84
≥35-36 weeks	28	56.0	27	54.0		
Mean ±SD	34.02±1.7		34.04±1.6			
Mode of current delivery						
NVD	31	62.0	26	52.0	1.02	0.31
CS	19	38.0	24	48.0		

Table 3: Frequency Distribution of Studied Primiparous Women Regarding Their Satisfactory Knowledge about Selected Aspects of Postpartum Complications Throughout Study Phases (n=100).

Knowledge dimensions (satisfactory)	Phase	Studied groups				χ^2	p-value
		Study group		Control group			
		No.	**%**	**No.**	**%**		
peripertum	**Pre**	45	90.0	45	90.0	0	1
	Post	48	96.0	40	80.0	6.1	0.014
	Follow up	46	92.0	40	80.0	2.99	0.08
Dangers signs of periperuim	**Pre**	9	18.0	10	20.0	0.07	0.8
	Post	45	90.0	20	40.0	27.47	0.0001**
	Follow up	41	82.0	18	36.0	21.87	0.0001**
Puerperal sepsis	**Pre**	9	18.0	8	16.0	.07	0.79
	Post	36	72.0	6	12.0	36.95	0.0001**
	Follow up	34	68.0	6	12.0	32.67	0.0001**
Breast engorgement	**Pre**	10	20.0	11	22.0	0.06	0.81
	Post	44	88.0	12	24.0	41.56	0.0001**
	Follow up	37	74.0	7	14.0	36.53	0.0001**
Crackle nipple	**Pre**	8	16.0	8	16.0	.000	1
	Post	38	76.0	7	14.0	38.83	0.0001**
	Follow up	26	52.0	4	8.0	23.05	0.0001**
Inverted \ flat nipple	**Pre**	9	18.0	10	20.0	.07	0.799
	Post	40	80.0	7	14.0	43.72	.0001**
	Follow up	37	74.0	8	16.0	33.98	0.001**
Deep venous thrombosis(DVT)	**Pre**	7	14.0	8	16.0	.078	0.78
	Post	44	88.0	11	22.0	44	0.0001**
	Follow up	40	80.0	8	16.0	41.03	0.0001**
Caesarean section surgical site infections	**Pre**	15	30.0	10	20.0	1.33	0.25
	Post	42	84.0	11	22.0	38.58	0.0001**
	Follow up	34	68.0	7	14.0	30.14	0.0001**
Episiotomy or perineal pain	**Pre**	10	20.0	11	22.0	.06	0.81
	Post	44	88.0	11	22.0	44	0.0001**
	Follow up	35	70.0	8	16.0	29.74	0.0001**
Postpartum depression	**Pre**	7	14.0	8	16.0	.078	0.78
	Post	36	72.0	8	16.0	31.82	0.0001**
	Follow up	28	56.0	5	10.0	23.93	0.0001**

χ^2 = Chi square test non-significant p>0.05 (**) highly significant at P < 0.01

Table 4: Comparison between pre, post and follow up of Primiparous women's knowledge mean score among study and control group (n=100)

Study phase	Study group n.50	Control group n.50	u	P
	Mean ±SD	**Mean ±SD**		0.13
pre	12.8±8.7	12.3±10.1	1.5	
Post	32.9±9.4	13.9±11	6.4	0.0001**
Follow up	30.9±9.4	12.5±9.5	6.7	0.0001**
P1	Paired t 0.0001	W = 0.12		
P2	Paired t 0.0001	W=0.13		

U: Mann-Whitney U **W**: Wilcoxon Signed Ranks Test (**) highly significant at P < 0.01
p1 (comparison pre & post), **p2** (comparison post &follow up)

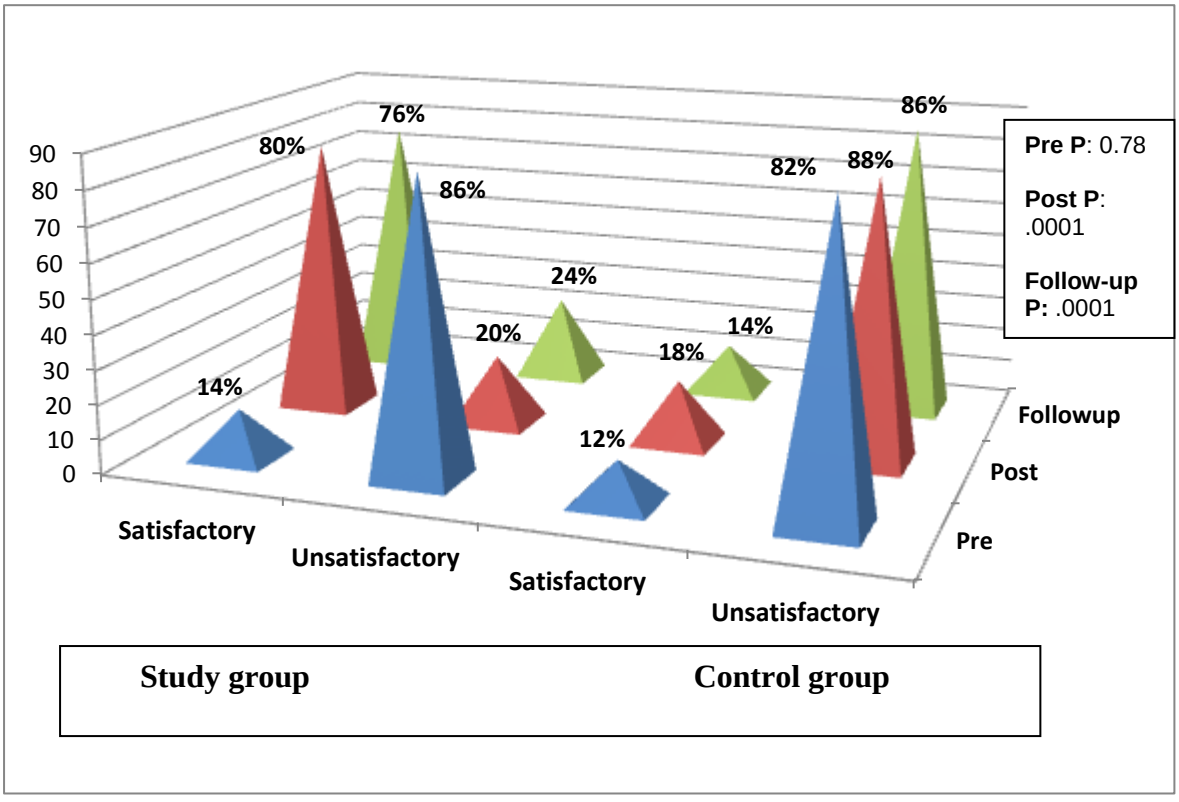

Figure (1): Total Knowledge Score for Study and Control Group Throughout Study Phases .n =100

Table 5: Distribution of Studied Primiparous women According to Their Satisfactory Practices about Prevention of Some Postpartum Complications Throughout Study Phases (n=100).

Practice dimensions satisfactory	Studied groups					χ^2	p-value
		Study group		Control group			
	Phase	No.	%	No.	%		
Perineal and episiotomy care	Pre	13	26.0	12	24.0	0.05	0.82
	Post	33	66.0	8	16.0	25.8	0.0001**
Syringe technique for the care of inverted or flat nipple	Pre	7	14.0	8	16.0	.08	0.78
	Post	29	58.0	7	14.0	21.01	0.0001**
Leg and foot exercise	Pre	1	2.0	0	.0	1.01	0.32
	Post	39	78.0	10	20.0	33.65	0.0001**
Breast feeding technique	Pre	8	16.0	8	16.0	.000	1
	Post	32	64.0	15	30.0	11.6	0.001**

χ 2 = Chi square test non-significant p>0.05 (**) highly significant at P < 0.01

Table 6: Comparison between pre and post of Primiparous women's practice mean score among study group and control group (n= 50)

Study phase	Study group n.50	Control group n.50	u	P
	Mean ±SD	Mean ±SD		
pre	11.4±2.2	9.9±2.9	1.5	0.13
Post	23.4±4.9	14.9±5.4	6.4	0.0001**
P1	Paired t 0.0001	W=0.11		

U ,: Mann-Whitney U , p1(comparison pre& post)

(**) highly significant at P < 0.01

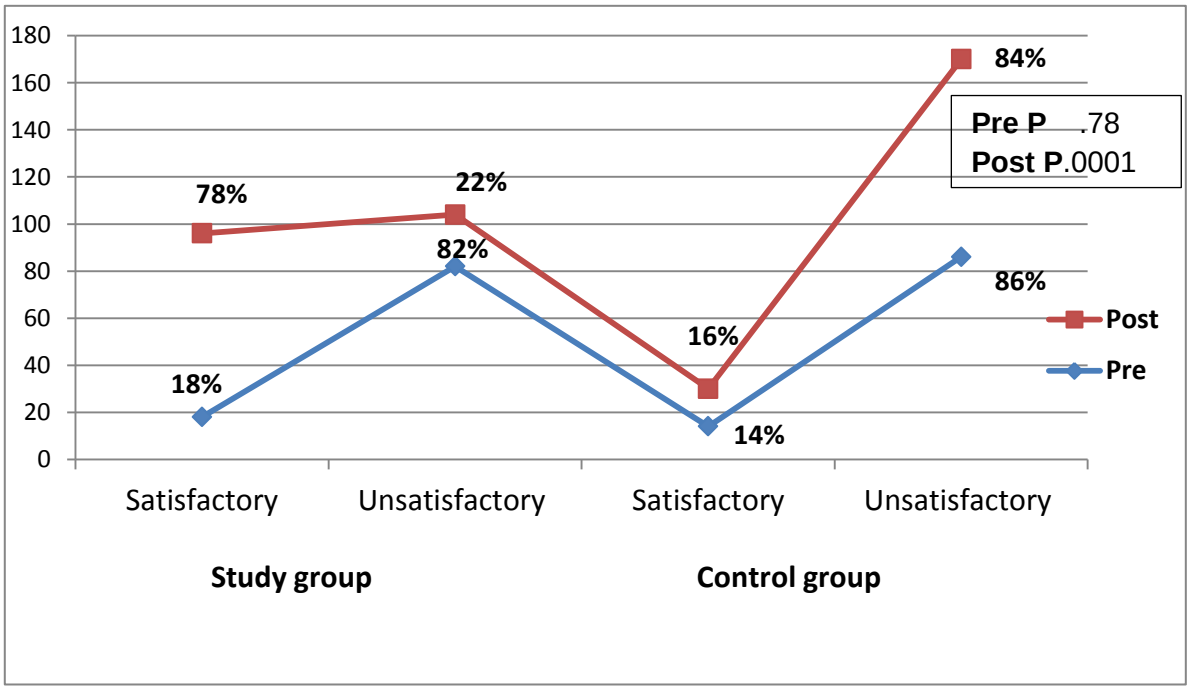

Figure 2: Total practice Score for Both Groups throughout Study Phases .n =100

Table 7: Postpartum Complications Encountered in the Study and Control Group. n=100

Items	Groups		χ^2	p-value
	Study group	**Control group**		
	n.(%)	**n.(%)**		
Post-partum complication				
Yes	3(6.0%)	8 (16.0)	f	0.72
Types of complications				
Breast engorgement	1(2.0%)	3(6.0%)	2.4	0.49
DVT	0(0%)	1(2.0%)		
Postpartum depression	2(4%)	4 (8.0%)		
χ 2 = Chi square test	f:Fisher exact test		non-significant	p>0.05

Table 8: Correlation between Total Practice and Total Knowledge of Study Group Pre and Post Intervention (n=50)

Parameters		**knowledge score**	
		(r)	**P**
Pre	practice score	-0.185	0.198
Post	practice score	0.743	0.0001
(r) Correlation coefficient		p<0.05 significant	

Table 9: Simple Linear Regression Model For Predict Post Practice Score among Study Group (n. 50):

Predictors	Regression coefficients B	t	Sig.	r	R^2
Constant	10.49				
Post Knowledge score	0.309	7.703	.0001	0.74	0.55

β = regression coefficients, R square =55% of predictors Anova model=59.3, p=0.0001

Post Knowledge score was significant, predictor of post-practice score

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