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**An Outcome Evaluation of the Maternal Care Manual of the Perinatal Education Programme (PEP)**

**By**

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A dissertation submitted in partial fulfilment of the requirements for the award of the Degree of Master of Commerce in Monitoring and Programme Evaluation

**Faculty of Commerce**

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**COMPULSORY DECLARATION**

This work has not been previously submitted in whole or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works of other people has been attributed, and has been cited and referenced.

**Signature:** Signed by candidate **Date**.....25.05.2009.....

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## **DEDICATION**

**To the Staff of Mowbray Maternity Hospital.**

## ABSTRACT

This study presents an outcome evaluation of the maternal care manual of the Perinatal Education Programme (PEP) studies by 32 midwives at Mowbray Maternity Hospital, a training facility in Cape Town, South Africa. Pre-and-post course knowledge assessments and a survey of participants were used to evaluate the maternal care manual of the PEP. Knowledge assessment scores achieved by the midwives before and after the course were compared. This was done to measure the knowledge acquisition of midwives who participated in the programme. In addition, a broader survey was administered to the participants in order to map out the perceived gain in knowledge, clinical skills and acceptability of the programme. The study found out that the midwives who attended the course improved their knowledge in maternal care. The mean score obtained by the midwives in the formal examination at the end of the course (i.e post-test scores) was higher ( $M = 89.0\%$ ,  $SD=8.15$ ) than the mean score obtained before they studied the 15 units of the maternal care manual ( $M = 62.5\%$ ,  $SD = 8.61$ ). This implies the average improvement in the scores of the midwives was 26.5%. Using the paired t-test for means, a significant ( $t(42) = -10.6$ ,  $p<0.05$ ) gain in knowledge was observed. Furthermore, analysis using the z-test for independence of scores, showed that the means were significantly ( $t(42) = 9.45$ ,  $p<0.05$ ) different. The results of the survey indicated that most midwives perceived gain in knowledge (94%) and skills (96%) by participating in the programme. The study concludes the course was successful and recommends the use of the PEP in all hospitals in South Africa for the improvement of knowledge of midwives.

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## **CHAPTER 1: INTRODUCTION**

Research has shown that one way of reducing the maternal and infant mortality rates in hospitals is to improve the standard of care. (Pattinson, Woods, Greenfield & Velaphi, 2005; Theron, 1999). In order to provide improved care to mothers and their newborn babies, there is growing need for continuous professional education and training of midwives (Harris, Yates and Crosby, 1995; Kattwinkel, Nowacek, Cook, Hurt & Short, 1984; Osorno, Campos, Cook, Vela & Dávila, 2006). Specifically, midwives require continuous training in order to improve and update their knowledge and practical skills (le Roux, Pattinson, Tsaku & Makin, 1998). The Perinatal Education Programme (PEP) was designed to meet some of these training needs (Theron, 1999; Woods, 1999). In order to determine the extent to which PEP has addressed these needs, this study evaluates the effectiveness of the maternal care manual of PEP in improving the knowledge and skills of midwives practicing at Mowbray Maternity Hospital.

### **Background to the problem PEP seek to redress**

Worldwide there are approximately 130 million babies born every year and four million of these do not survive beyond the first seven days after delivery (United Nations, 2001). Underdeveloped nations contributed the greatest proportion of these mortalities. In South Africa, 87% of newborn deaths occurred during the first seven days after birth (Pattinson, 2001). The World Health Organisation (WHO) (2005) reported that at least 260 mothers and babies die every day in South Africa. Most of these deaths were attributed to low standards of maternal and infant care.

One of the New Millennium Development Goals of the World Health Organization (WHO) initiative is to reduce the mortality rate of children under five years of age from 95 per 1000 to 31 per 1000 by 2015 (United Nations, 2001). To progressively move towards attaining this Millennium Development Goal, South Africa needs to take drastic

measures to reduce both child and maternal deaths substantially by improving the standard of care of mothers and their babies (Osorno, et al., 2006; Pattinson, et al., 2005).

In South Africa, one of the ongoing initiatives to reduce infant and maternal mortality rates is to empower midwives with knowledge and skills in order to improve service delivery through the PEP (le Roux, et al., 1998; Theron, 1999; Woods, 1999). A maternal mortality rate of 83 per 100000 births was reported during 1980-1982 and a perinatal mortality rate was recorded during 1989-1991 (Louw, Khan & Woods, 1995). These high mortality rates instigated the need to implement measures that would contribute towards the reduction of these rates. PEP was one of the interventions identified to ameliorate this problem. This program will be discussed in detail later in this chapter.

### **Programme description: Brief history**

The health care system in South Africa is divided into three levels: primary, secondary and tertiary levels. Amongst the aforementioned levels, most of the training of health personnel, including midwives, occurs at tertiary level facilities which are usually located in cities (Woods, 1999). Typical to several developing countries around the world, South Africa is not adequately resourced to conduct midwifery training at both primary and secondary level facilities (Theron, 1999a, 1999b; Woods, 1999). In addition, the midwives stationed at primary health facilities located in rural areas undergo the least training because they are the furthest away from training hospitals (Woods, 1999).

The problem of access to training for midwives is further exacerbated by the failure to send trainers to rural areas for a long time because of the associated costs. Furthermore, it is also impractical to transfer doctors and nurses from secondary and primary centers to attend the training at tertiary facilities in cities (Davies, Hall, Harpin & Pullan, 2005; Theron, 1999b). It was against this background that the Perinatal Education Programme (PEP) was developed. The PEP is a self-help initiative, which does not require a tutor and the students are responsible for their own learning (Theron, 2000). In addition, PEP is an

outreach education programme that aims to make midwives study at their own pace, in the comfort of their work places (Woods, 1999). Given the limited resources that most facilities in South Africa health face especially those in rural areas, the PEP programme was designed to be cost effective and easy to manage.

The Perinatal Continuing Education Programme (PCEP) was developed at the University of Virginia between 1975 and 1978 in the United States of America (USA) (Osorno et al., 2006). The PEP implemented at Mowbray Maternity was developed from PCEP. The PCEP was formulated as part of the US National Institutes of Health support of perinatal care education. Specifically it was designed to meet the learning needs of health practitioners who needed to update their knowledge. It was a brain child of a group of experts comprised of obstetricians, neonatologists and midwives (Woods, 1999).

The use of PCEP has not only spread across 43 states in USA, but has been translated, adapted and implemented in other countries such as China, Poland, Indonesia and Mexico (Cook, 1992; Kattwinkel, Nowacek, Cook, Pietrzyk, Borkowski, Karasinska-Urbanik, Molicki, Godlewska & Rozanski, 1997; Osorno et al., 2006).

In South Africa, the PEP was adapted from PCEP in 1988 and was redesigned and implemented by a board of obstetricians, neonatologists and midwives in such a way that it does not only meet local needs, but is also relevant to other Southern African nations (Woods, 1999; Osorno et al, 2006). The PEP is used by several universities and teaching hospitals in many provinces of South Africa. Examples of universities which use PEP in their curricular include: the Medical School of South Africa (Medunsa) and the University of Cape Town (UCT). Some of the teaching hospitals that use PEP include, the Groote Schuur hospital and Mowbray Maternity hospital.

The provinces that have used PEP as a vehicle for continuing education for a broad spectrum of health professionals comprising of doctors, nurses and nursing assistants include the Eastern and the Western Cape provinces (Woods & Theron, 1994; Theron,

1999a; Woods, 1999). The use of the PEP has since spread to other countries in the Southern African region such as Zimbabwe, Botswana and Namibia (Harris, Yates & Crosby, 1995). In all the aforementioned countries, including South Africa, the design of the PEP is such that it is not only compatible for use in regional hospitals, but also in smaller community hospitals, obstetric and neonatal health care providers (Osorno et al., 2006).

### **Programme content**

This section describes the programme content of the PEP and it is important to highlight some of the programme content because some of the evaluation questions will refer to aspects of the programme content. The PEP is designed in such a way that midwives learn both theoretical and practical skills (Woods, 1999). The content of the PEP is composed of eight manuals. These are:

1. Maternal care
2. Newborn care
3. Perinatal HIV/AIDS
4. Primary new-born care
5. Mother and baby friendly care
6. Saving mothers and babies
7. Birth defects
8. Primary new-born care (comprising two modules)

The manuals are composed of different training units. At the start of each unit the authors define specific learning objectives. The learning of the theoretical knowledge consists of a question and answer method. Case problems which highlight various clinical scenarios are presented at the end of each unit so that students can apply their knowledge (Woods, 1999). At the end of some of the units in the manuals, there are skills workshops. These are presented with a sequence of instruction style dealing with different medical

conditions relevant to each unit. Among the aforesaid manuals, this study seeks to evaluate the maternal care manual.

### **Knowledge assessment in the PEP**

When working through the manuals, it is envisioned that students study in groups of five to ten people. By using group work, students share information and their working experiences, thereby learning from one another. This reinforces an element of team work and co-operation among group members. It is envisaged that group work further simulates their work environment in the wards. Studying at individual capacity is not encouraged and therefore a coordinator, who usually is a senior nurse employed by the hospital, is selected. Usually, coordinators have their own designated duties in the hospital. Basically, one of the roles of a coordinator is to ensure the PEP activities at the hospital are well coordinated.

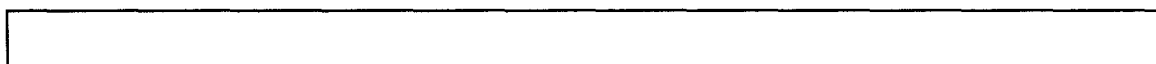
The coordinator fulfils this role on a voluntary basis, and there is no remuneration attached to the position. Generally, coordinators are senior nurses whose duty entails arranging PEP meetings. In these meetings, units under review are discussed, the pre-and-post tests are taken, and practical demonstrations are done. Participants complete and mark their own multiple choice tests before and after each unit is studied. The multiple choice tests completed before each unit help identify weaknesses and knowledge to be learned. The multiple choice tests done by participants after each unit has been studied identify sections which need further attention. These sections include those with concepts not understood by the participants. After a manual has been completed, a formal and final examination is given. A mark of 80% is required to pass the examination. A certificate is given to students who complete and pass each examination. The examination seeks to assess if knowledge acquisition has in fact occurred.

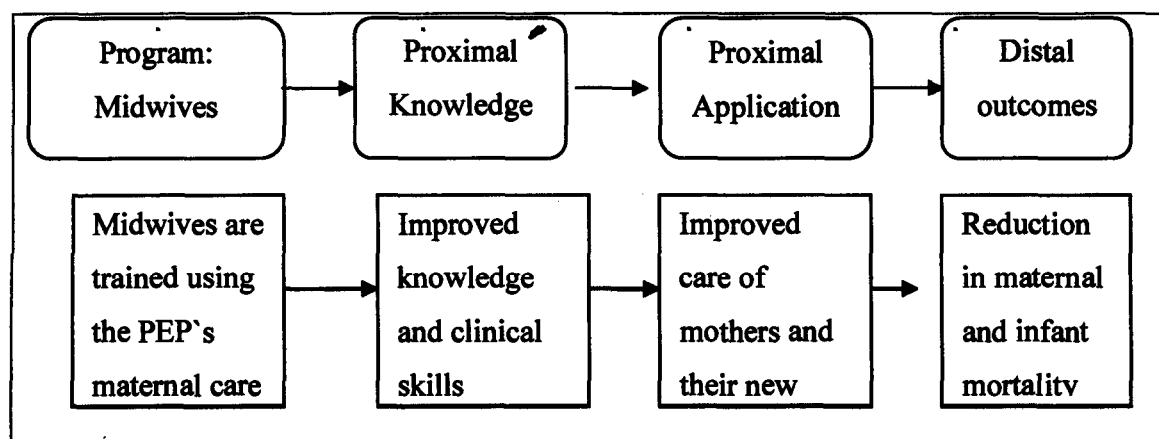
### **Context of the evaluation of PEP: Mowbray maternity hospital**

At the Mowbray maternity hospital, the PEP is run by the Education Department. The education department is responsible for coordination of all the learning activities undertaken by the hospital staff. The programme was introduced at the hospital in 2006. To date, about 42 midwives have gone through the maternal care manual of the PEP. The programme is managed by one of the chief professional nurses who is assisted by two other senior midwives who also fulfill the role of tutors. The senior nurses convene meetings after every week and in these meetings the contents of the manuals are discussed and pre and post tests of the units are done. The meetings are scheduled during normal working hours and attendance is compulsory. The attendance of these meetings is considered as though the midwives are carrying out their normal working duties. At the Mowbray maternity hospital, the intervention (i.e the PEP) is comprised of the maternal care and newborn care manuals. The contents of these manuals are different conceptually in terms of the scope and application in the wards. These manuals (i.e maternal and newborn manuals) form the cornerstone of the PEP because all the previously mentioned manuals hinge on these aforementioned listed manuals. Since the inception of the PEP at the Mowbray maternal hospital in 2006, there has been no known evaluation of the maternal care and new born care education interventions for the midwives at this hospital.

### **The programme impact theory**

In order to undertake the evaluation of PEP the programme theory should be described. A programme impact theory describes "...cause-and-effect sequences in which certain program activities are the instigating causes and social benefits are the effects they eventually produce" (Rossi, et al., 2004, p.168). In the PEP at Mowbray maternity hospital, the programme impact theory presumes that when midwives are exposed to the maternal care manual, their cognitive knowledge and clinical skills (outcome variable) will improve and this would improve the standard care with beneficial effects on infant and maternal outcomes (see Figure 1).





*Figure 1: The programme impact theory*

The outcome is measured on the target population before and after the programme to determine if learning has in fact occurred. This is an outcome evaluation that focuses on proximal outcomes of the programme (see Figure 1). The proximal outcomes are the first set of outcome(s) that come about after the intervention. Contrary to proximal outcomes, distal outcome(s) can only be measured at a later stage (Babbie & Mouton, 2003) and they are generated after the proximal outcomes (Rossi, et al. 2004). These outcomes often reflect the impact of the programme over time on the target population. For instance, in the PEP the reduction in maternal and infant mortality rates reflects the distal outcomes which can only come into effect in a broader public domain at a later stage, whereas the proximal outcomes affected the midwives directly.

## **The framework for PEP evaluation**

It is imperative that programmes adopt a framework for evaluation. This section focuses on the proposed framework of evaluations of PEP by Kattwinkel, Cook, Nowacek, Bailey, Crosby, Hurt, and Short (2004). Rossi, et al. (2004, p.16) define program evaluation as "...the use of social research to systematically investigate the effectiveness of social intervention programs in ways that are adapted to their political and organisational environments and are designed to inform social action to improve social conditions." The purpose of evaluation research sets the tone for decisions about design, measurements, analysis and reporting (Kattwinkel, et al., 2004). Kattwinkel et al. described four components of an evaluation plan that are essential when conducting evaluations of perinatal outreach education programs (a perinatal outreach education program is similar in principle and practice to the PEP).

The first component outlines a clear statement of the purpose of the perinatal outreach education programme; the second component identifies the stakeholders; the third component measures the process of evaluation in terms of programme structure and information delivery, programme activities and participant characteristics and lastly, the fourth component measures the outcomes of education programme (see Table 1) in terms of the perceived changes that are expected in the event that the programme is successful and the expected change in the population.

In the light of the fourth component, the program theory of the PEP evaluation of the maternal care manual highlights the changes imparted onto the participants in terms of knowledge change when exposed to the maternal care manual.

**Table 1:***Examples of measures of programme outcomes*

Outcome	Evaluation measure
Programme use and acceptance	Participation rate Completion rate Evaluation forms
Knowledge change	Preprogramme vs postprogramme test scores
Facilities change	Preprogramme vs postprogramme inventory survey
Core practices change	Chart review Patient status at transport Referral patterns
Consistency of care change	Preprogramme vs postprogramme survey of practice routines
Patient outcome change	Morbidity Mortality

Source: Adapted from Kattwinkel, Cook, Nowacek, Bailey, Crosby, Hurt, and Short (2004).

## Evaluations of the PEP

This section focuses on reviewing the literature of PEP evaluations conducted in different countries. This particular literature review focus on evaluation aspects such as methodological strength and weakness. Furthermore, it will also highlight the inherent differences of these evaluations when they are compared to the PEP evaluation at Mowbray maternal hospital.

PCEP was successfully implemented in Mexico. In order to establish the programme worthiness PCEP was evaluated in Mexico by Osomo, Campos, Cook, Vela, and Dávila (2006). The stakeholders in this evaluation were in tertiary, secondary and the rural Mexican Institute of Social Security hospitals on the Yucatan Peninsula. The participants in this study included doctors, nurses and nursing assistants who were working with pregnant mothers and newborns. The programme structure was such that it was an educational intervention of the PCEP carried out between January 1998 and December 2001. This evaluation specifically included the percentage of personnel who attended,

those who completed the programme, the level of pre/post intervention knowledge, an opinion survey of the programme and the quality of neonatal care according to expert-recommended routines. The results of this evaluation showed that 65% of the 1421 people in the population began the study and 72% of those completed it. Improvement was observed in 14 of 23 evaluated neonatal practices. The participants rated the material as very clear and useful in practice.

Although this evaluation was referred to as an implementation evaluation, it clearly had components typical of outcome evaluation. This is supported by the aspect that Osorno, et al., (2006) also had to answer evaluation questions pertaining to knowledge gain. Similar to the Mowbray study, the evaluation by Osorno et al. also answered questions directed at programme coverage, programme design and learning outcomes.

Despite favourable outcomes of knowledge increase and perinatal care, Osorno, et al. reported that the study had low participation of the ward staff dealing with children between the age of 5 and 13 years. One explanation alluded to by Osorno et al. regarding the low participation of staff was that the content was biased to new born care. The results of the study indicated that this had no effect on the outcome. The strength of the evaluation conducted by Osorno et al. stems from use of an opinion survey and knowledge assessment.

The study by Osorno et al., (2006) resembles the Mowbray evaluation in several ways. Both studies used of the pre-and-post knowledge assessment and an opinion survey to measure knowledge gain in the participants. Different to the Mowbray study, the study by Osorno et al. had different people from different disciplines in its target population. The target group included midwives, doctors and nursing assistants. In this regard, the strength of the Mowbray study lies in the composition of the target population which had a homogenous group of participants compared to the study by Osorno et al.

In Brazil, an evaluation study was done which compared the effectiveness of two training strategies for essential newborn care (Vidal, Ronfani, Silveria, Mello, Dos Santos, Buzzetti & Cattaneo, 2001). In this study, Vidal et al (2001) compared conventional 5-day training to a self-directed learning programme similar to the PEP which lasted about 5 weeks. Participants were tested at baseline and after the completion of the course. The participants' practices were also observed before training and after training. The findings of this study found no difference between the two training strategies. However, self-directed learning was found to be cheaper and better managed. This was a difficult study in which to measure the effect of the intervention, simply because it involved no direct comparison to a similar group without intervention. Perhaps more comparison groups should have been added to evaluate the programme effect. It would have been more prudent to use, say, a randomised control trial or quasi-experimental design to obtain the true programme effect. The programme process, design, implementation and measurements were consistent with good programme evaluation. However, this evaluation was weakened by failure of the participants to complete all of the tests.

One major premise to achieve the purpose of the PEP is to ensure that midwives understand the contents of the training manuals. To set the appropriate bench mark levels in terms of the conceptual framework and to provide an answer to the question whether midwives understand the contents of the training manuals, Woods (1999) conducted a field trial in South Africa during the development of the training manuals, in what seemed to be a pilot study. The participants were volunteers and there was no control group. The knowledge of the material was assessed using the pre and post-test results of the units studied. Woods (1999) alluded to the fact that this form of testing provided a better idea of short-term cognitive knowledge compared to long-term cognitive knowledge when post testing is done after the completion of the whole manual. In addition improvement was reported in midwives' knowledge in maternal and newborn care by 20% and 21% respectively. The findings of the field trial allowed the authors and those involved in the design of the PEP in South Africa to make a continuous review of the contents of training manuals working from the feedback obtained from the midwives

who participated in the programme. This study was different from this study because it did not assess improvement of skill and there was no opinion survey.

Although there was evidence that demonstrated that midwives understood the contents of the manuals, another question for evaluators arises directed at whether the PEP improved the knowledge and skills of midwives in South Africa. Few studies have been done on this aspect. In all the studies, the PEP manuals were used as an intervention. These studies were similar to this study because they were all conducted in South Africa and PEP was the intervention.

When PEP was introduced in the Eastern Cape (South Africa), Theron (1999a) conducted a prospective randomised control trial. The research objective of the study was to determine whether the maternal care manual of the PEP was effective in improving the cognitive knowledge of midwives. The study involved three towns, one of which received the intervention and the remaining two towns did not. In order to determine the outcome of the study the midwifery knowledge was measured before the start of the study and thereafter intervention was subsequently affected. The changes in the cognitive knowledge were tested using 70 multiple choice questions. Following the completion of the intervention after 12 months, the midwives were tested again with the same test. A comparison of the mean scores before and after the intervention showed a significant improvement of cognitive knowledge in midwives who completed the maternal care manual. However, the study conducted by Theron (1999) did not mention the criterion for selection of the towns. One would have expected the towns to be different based on the population domain they serviced, their sizes and the geographical location of the towns. Based on the above shortfall, one would question the programme coverage. The study by Theron (1999) study was different from this study because it was a multi-location study whereas ours was conducted in a single facility. Furthermore, Theron (1999) did not have an opinion survey to measure the perception of the participants.

Le Roux, Pattinson, Tsaku, and Makin (1998) conducted a study in Mpumalanga Province that successfully demonstrated that successful completion of the PEP resulted in

improved obstetric practice. This study was done in three obstetric units. Two of the obstetric units received the PEP intervention. A 'before-and-after' study design, similar to the design used in this study was used to assess any changes in practice and to monitor whether any changes occurred in the district during the time of the study. This research design was used because of the limited sample size and for convenience. It was also noted that participants volunteered to participate in the study. This could however, possibly introduce selection bias into the study.

In another evaluation study conducted in South Africa, Theron (1999b) found that midwives who studied the Maternal Care Manual significantly improved their ability to interpret clinical information and apply their knowledge. This was demonstrated by a prospective controlled trial. In this study, the assessment was based on whether midwives could identify and interpret clinical information, especially abnormal findings in antenatal records and partograms. This study partially demonstrated the effectiveness of the maternal care manual in imparting clinical skills on the participants.

In all the studies reviewed, it could be seen that the intervention (i.e the PEP) was effective in improving the knowledge of midwives. All the studies demonstrated this aspect despite the different methodological approaches which were employed. In the Western Cape (South Africa), there are no studies conducted to determine the effectiveness of the PEP. This study was the first one to be conducted at a single secondary facility in the Western Cape. The evaluation conducted at Mowbray hospital also made use of methodological triangulation as two methods of data collection were used.

## **The evaluation questions**

In order to effect the aforementioned outcome evaluation, a set of evaluation questions needs to be formulated. These questions will provide meaningful information about programme performance (Rossi, et al., 2004). For the purposes of this research, the evaluation questions have been divided into four categories: these are 1) coverage, 2) programme design, 3) learning outcomes and 4) application outcomes. The evaluation questions have been listed under each category.

### *Coverage*

The coverage analysis will provide information about the acceptance of the programme by the midwives and the extent of their participation (Babbie & Mouton, 2003). Implementation bias is detected by comparing the programme participants by subgroup (Rossi et al., 2004). For example, implementation bias could be such that the subgroup of midwives working in the labour wards could be systematically different from the subgroup of midwives working in the neonatal wards.

The coverage analysis would be conducted by first identifying the general characteristics of the midwives by using programme records to access relevant information on employees' records, for instance demographic information. From this information, specific characteristics pertinent to ability to participate in the programme can be singled out (Rossi et al., 2004). For example, some of the group meetings may be scheduled after working hours and midwives who live far away may find it difficult to attend. This will further explain the composition of groups according to allocation by shifts or living arrangements. The attendance of group meetings and skills workshop can be obtained from the group register which has all names of participants and details of attendance. Information about programme drop out is also obtained from these records. Analysis of this information would eventually determine if there was a systematic difference between the midwives remaining in the programme and drop outs (Love, 2004). This is important

because it could constitute a summative evaluation which enables improvements to be effected to the program.

The evaluation questions that cover coverage are:

1. How many midwives practise at Mowbray maternity hospital?
2. What is the proportion of midwives who have participated in the PEP at Mowbray maternity hospital?
3. What is the attendance rate in the PEP for the enrolled midwives?
4. What is the proportion of enabled midwives who successfully complete the PEP per year?

### ***Programme design***

The questions that cover programme design will emanate from the design of the PEP. Specifically, one would look at the maternal care manual and different activities. The programme design also covers the programme operations needed to make the programme impact theory effective. The indication of whether the programme functions are being performed adequately is obtained from the activities. Most of these activities emanate from engagement with the maternal care manual and other associated activities that include group meetings, practicals and examinations. Also considered under design are various factors from the implementation setting that support or impede the programme design.

The design questions are:

5. Are the planned educational activities from the content material of the maternal care manual the most appropriate for midwives and for purposes of improving their knowledge?
6. Are there specific areas the midwives have done well?
7. Are there any specific problems from the maternal care manual which need further reviews?

### ***Learning outcomes***

The learning outcomes category focuses on the main objectives of this research. It will seek to answer questions relating to knowledge transfer to the midwives. It also attempts to answer questions relating to competing interventions.

The learning outcomes questions include:

8. Is there improvement in the knowledge of the midwives?
9. Is there improvement in the skills of the nurses?
10. Besides the intended outcomes, what other outcomes would be attributed to the learning intervention?
11. What other learning initiatives have been done for the midwives prior to their enrollment into PEP?

### ***Application outcomes***

An example of an application outcome question entailed:

12. Is the PEP providing any form of support and/or advice for midwives in terms of clinical skills related tasks?

This section highlighted the evaluation questions and the next section looks at the description of the methodology which was used to answer the evaluation questions.

## **CHAPTER 2: METHOD**

The study incorporated aspects of both formative and summative evaluations. Formative evaluation is a process oriented evaluation which seeks to provide information that will guide program improvement (Rossi, et al., 2004). In order to effect programme improvement, it is essential to get some feedback from the participants (Babbie & Mouton, 2003). The information provided by the participants would help programme designers to effect necessary changes in the programme. At the Mowbray maternity hospital, PEP has been running for three years and in that period, there has been no documented feedback from the programme participants. This presented little opportunity to guide meaningful programme improvements based on the opinion of the participants regarding the programme.

Summative evaluation focuses on aspects of programme performance more inclined to attainment of programme objectives (Rossi et al., 2004). In this study, summative evaluation answers questions directed at assessing if the midwives have acquired knowledge from the maternal care manual of PEP. In this study, the basis of the summative evaluation is set to answer questions relating to the learning outcomes of the PEP, specifically looking at knowledge gain in participants.

### **The participants**

There were 42 midwives who completed the maternal care module of the PEP at Mowbray Maternity Hospital (Cape Town) between 2006 and 2008. In this sample, three were chief professional nurses, two were senior nurses and 35 were professional nurses. These midwives came from different departments of the hospital. These departments included: the education, admission, neonatal ward, after birth unit and antenatal unit. At the time of the study, all the midwives had sufficient records of their final examination and pre-test scores. However, when the survey was administered, five midwives who had

participated in the study had resigned and three were transferred to other health facilities. Those midwives who were transferred were successfully tracked down. At the time of the analysis, 37 midwives responded to the questionnaire. This was equivalent to a response rate of 88%. Separate supervisor questionnaire was also circulated and five out of eight supervisors responded.

There were only three male nurses and the 35% were aged between 30 and 35. Most of the participants were English speaking (48%). The proportions of participants that had worked one year or less at Mowbray and had spent one or less years in the midwives were 45% and 40%. There were no specific criteria which determined how midwives were selected into the programme from the various departments.

## **Procedure**

### ***Step 1: Assessing knowledge***

A pre-and-post test research design was used to assess whether midwives knowledge improved after the intervention. In this research design, outcomes were measured on the same target population before program participation and after adequate participation (Rossi et al, 2004). The effects of the intervention on the target group noted before and after the program participation would be attributable to the intervention (Babbie & Mouton, 2003).

In the pre-and-post test research design, the knowledge of the midwives was first measured before exposure to the intervention (i.e the maternal manual) and remeasured after the intervention. The pretest scores constituted marks of tests at the beginning of each unit. A total of these pretest scores per individual gave a total pretest score that was compared to the post-test scores obtained as a mark for the formal examination given at the end of the program. The final pass mark for the examination was set at 85%. The time interval between the pre-and-post testing was 12 months.

### ***Step 2: A broader survey to assess the programme***

A survey is used for descriptive, explanatory and exploratory purposes in a population (Babbie & Mouton, 2003).

In the broader survey, a questionnaire crafted from different sections of the maternal care manual was used. The broader survey was conducted to first map out the knowledge to the skills, secondly to assess the acceptability of the programme to the midwives (see Appendix 1). From this questionnaire the evaluator explored why some sections were not adequately attempted or why some of them were done satisfactory. Furthermore, the questionnaire helped to answer questions directed at possible gain of knowledge and skills attributable to other initiatives other than PEP. The questionnaire enabled the midwives to evaluate the PEP and suggest possible areas of improvement. Some questionnaires were administered to senior nurses in charge of the PEP at the Hospital.

### **Materials**

The study was carried out at the request of Professor Woods (the Editor in Chief of the PEP) to the school of Management Sciences at the University of Cape Town. The evaluator, a student at the University of Cape Town conducted the study as the dissertation component to partially fulfill the requirements of the Masters degree of Monitoring and Evaluation.

The information for the programme was obtained from informed meetings with Professor Woods (Editor in Chief of PEP) and the chief professional nurse, the PEP tutor at the Mowbray maternal hospital. This information included the structure of the PEP such as group meetings attendance and their members that subsequently gave the pre and post tests scores and the formal examination.

The maternal care manual has fifteen units and each unit was discussed collectively as a group by midwives. Meetings were scheduled after every three weeks. In these meetings, before and after attempting each of the fifteen units, midwives were tested. These tests

constituted twenty multiple choice questions. The unit scores of the multiple choice tests given before each unit was attempted were then used to determine the total average pre-test scores for each individual. The reason why these scores were used was based on the premise that they reflected the knowledge status of midwives before any acquisition of knowledge from the maternal care manual. After all the units had been covered, the midwives were tested by means of a formal examination. The scores of the formal examination constituted the post scores. The formal examination scores rather than the scores obtained at the end of each unit were used as the post scores because they were believed to be a better indicator of knowledge acquisition.

The scores obtained at the end of each unit often reflected first, any deficiencies in knowledge and secondly sections which needed further attention. This envisaged that the midwives needed to undertake a further a review of the units to ensure that they have fully grasped the concepts covered. This further justifies the use of scores of the formal examination because they are a better proxy for knowledge transfer than the scores obtained at the end of each attempted unit. The scores of both the units and the formal examination were recorded and properly documented by the chief professional nurse in charge of the PEP at the hospital.

In order to complement knowledge acquisition using the scores, a survey was designed and used as a data collection tool. The data was collected from the midwives and their supervisors. The survey included questions scored on a 5-point Likert type scale ranging from “strongly agree” to “strongly disagree”. These questions were related to: programme coverage, the implementation and the applications outcome. The questionnaire also included open ended questions which solicited suggestions for program improvement from the participants. Lastly, the questionnaire collected some demographic data such as the sex, home language and rank of the participants.

### **Data management and analysis**

The scores of the midwives who attended PEP between 2003 and 2007 were obtained from the senior nurse in charge of the PEP at Mowbray maternity hospital and then entered into SPSS (Version 14). The responses of the survey were captured onto Epidata software and exported to SPSS (Version 14). In both cases, the data was cleaned validated and analyzed.

It is important to note that the measuring instruments used to measure the acquisition of knowledge before and after the intervention was administered was not identical. However, conceptually, the instruments covered the same aspects. In as such, two approaches will be adopted for the analyses. The first approach treated the scores as independent and the second the second approach will treat the instruments as reasonably similar. In the first approach, the instruments will be treated as independent and the z-test for independent samples will be used. It will test the hypothesis that the mean score of the midwives before they studied the maternal care manual is less than the mean score after they studied the manual (in the final examination). In the second approach, the instruments will be treated as reasonably similar. In this approach, a t-test for paired means was used to test the null hypothesis that that there was no difference between the two means. Simple descriptive statistics and graphs will be used to present the findings.

### **Reporting of the results and ethical considerations**

The results will be reported to all major stakeholders. These include the department of psychology at University of Cape Town and the Mowbray maternity hospital. The ethical approval for this study was obtained after submission of the research proposal to the Ethics committee at University of Cape Town. In order for the study to be conducted at Mowbray Maternity Hospital, the permission was granted by the Hospital Research committee.

## CHAPTER 3: RESULTS

This chapter presents the findings of the evaluation of PEP at Mowbray maternity hospital. The findings are presented according to the themes derived during the analysis of the data as per the evaluation questions outlined in Chapter 1. These themes are: coverage, knowledge acquisition, programme design, learning outcome and content application.

### Coverage and attendance

Approximately 200 midwives currently practice at Mowbray maternity hospital and out of these 20% of them had participated in the perinatal education programme. All the participants completed the programme. In the three year life span of the programme, 83% of the participants successfully passed and completed the programme. The maternal care manual was studied over a period of 7 months. From the analysis of the survey results, as many as 62% of the participants had a median attendance rate of group meetings of 100%. In addition, 35% of the participants attended 90% of these meetings compared to 3% who attended 80% and below of these meetings. Evidently, the attendance of group meetings at designated times was satisfactory.

### Knowledge acquisition

The knowledge acquisition in the participants was measured using the pre-and-post scores. As mentioned previously, the formal examination constituted the post scores of the analysis. The mean score obtained by the midwives in the formal examination was higher ( $M=89.0$ ,  $SD=8.15$ ) than the mean score obtained before they studied the maternal care manual ( $M=62.5$ ,  $SD=8.61$ ).

When the analysis of the knowledge acquisition was conducted, two approaches were used as alluded to in the method section. The first approach used the z-test for independence of scores. The analysis showed that the means were different and that the mean reported after the manual was completed was higher than the mean before they studied the manual ( $t(42) = 9.45, p < 0.05$ ).

The second approach used the t-test for paired means. When this test was conducted, it reported a significant ( $t(42) = -10.6, p < 0.05$ ) difference of the means before and after the intervention was administered.

The results of the two different approaches demonstrated that despite the two different scenarios which were presented owing to instrument differences, there was evidence of improvement of knowledge.

The next section presents the quantitative analysis of the responses obtained from the survey which intended to consolidate the findings of the purported knowledge gain from the scores. The questions in the survey were grouped according to the nature of the information solicited from participants. This information included coverage as outlined above, learning outcomes, programme design and application outcomes. Lastly, four supervisors were also asked about their perception of PEP.

### **Programme design and operation**

It is clear from the responses that there were mixed opinions about the programme design. While some components of the programme design's design were viewed positively by the participants, some were viewed as having shortcomings. Table 2 shows the findings of the perception that participants had of the programme design and its operation. All the participants "agree" to "strongly agree" that the maternal care manual was user friendly. In addition, 96% of the participants "agree" to "strongly agree" that the content of the maternal care manual was easy to understand. Furthermore, 91% of the

participants “agree” to “strongly agree” that the small group discussions were an effective training method. However, 8.3% of the participants neither agreed nor disagreed that small group discussions were an effective training method.

**Table 2:**

*Participant perception of the programme design.*

	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
<b>Manual user friendly</b>	59.5%	40.5%	-	-	-
<b>Easy to understand</b>	59.5%	37.8%	-	2.7%	
<b>Small group discussion</b>	40.5%	51.4%	8.1%		
<b>Review and revision sessions effective</b>	100%	-	-	-	
<b>Sufficient time devoted to the programme components</b>	21.6%	43.2%	5.4%	27%	2.7%
<b>The scheduling of group meetings was convenient</b>	27%	56.8%	2.7%	13.5%	

All the participants agreed to strongly agreed that the review and revision sessions were an effective training method. Although 64.8% of the participants agree to disagree that sufficient time was devoted to each unit of the maternal care manual, a proportion of 29.7% felt the contrary. Furthermore, 73.8% of the participants agreed to strongly agreed that the meetings were conveniently scheduled whereas 13.5% disagreed.

In support of the scheduling of the PEP as part of the programme design, all the four supervisors agree to strongly that the scheduling of the maternal care manual was

appropriate all of them strongly recommended that the midwives working in their wards attend the programme.

### Learning outcomes

Figure 2 shows midwives perceptions of whether they had gained new skills from attending PEP. There was an equal proportion of participants (48.6%) who both agree and strongly agree that they developed new skills by attending the maternal care manual training. Only a smaller proportion (2.8%) neither agreed nor disagreed they developed new skills..

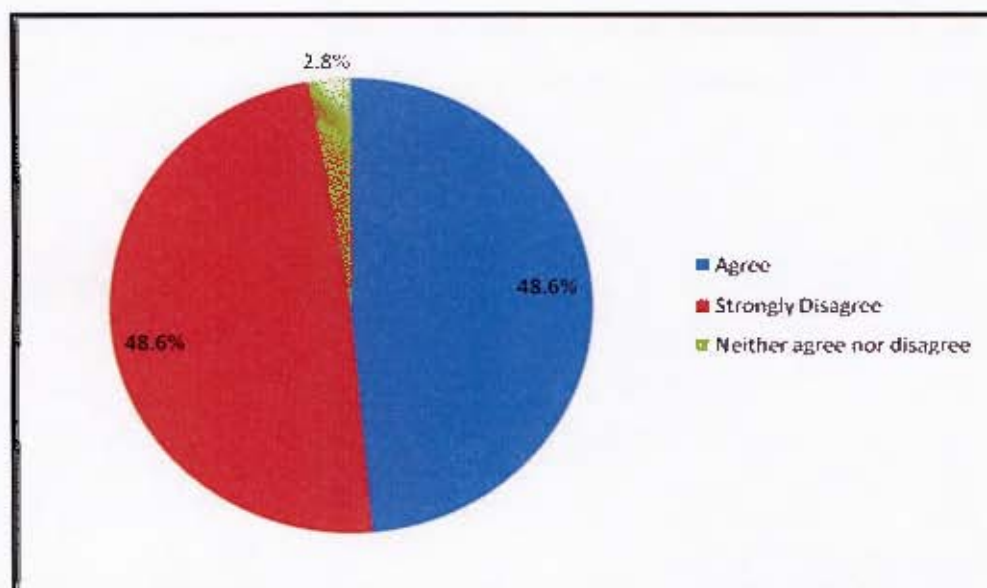
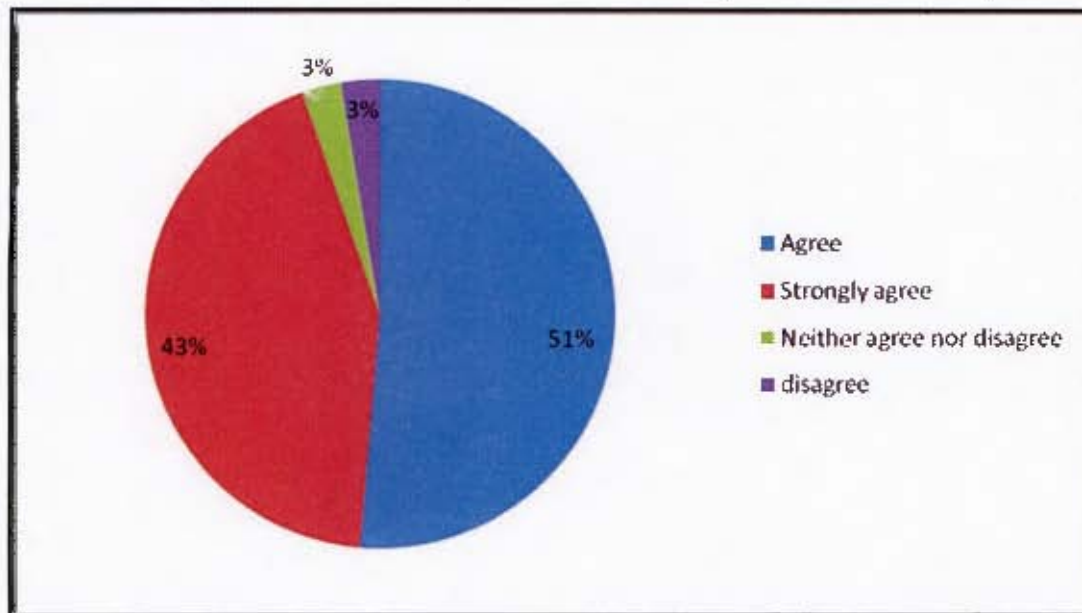


Figure 2 : Perceived gain in new skills by midwives who participated in PEP

Figure 3 shows the midwives perceptions of whether they gained new knowledge. About half of the participants (51%) agree that they developed new knowledge compared to 43% of the participants who strongly agree. An equal proportion felt that they disagree (3%) and neither agree nor disagree (3%) that they gained new knowledge.



*Figure 3: Perceived gain in new knowledge by midwives who participated in PEP*

In order to establish if the midwives attended courses with components of the maternal care, an analysis was carried out in this regard. Approximately 10% of the participants attended other maternal courses in the last 12 months. These courses included lactation, medication, perinatal update course and BCG training.

Table 3 shows the results of the participant perception of whether the programme addressed their learning needs and fostered team spirit 97% of the participants agreed to strongly agreed that their learning needs in the area of the maternal care were addressed by attendance of the programme.

Besides the learning outcomes such as the new knowledge and skills, another outcome of the programme included fostered team work and cooperation. Approximately 95% of the

participants agreed to strongly agreed that participation in the programme fostered team work and corporation among participants in their work environment.

### **Factors in the environment that facilitated the learning process**

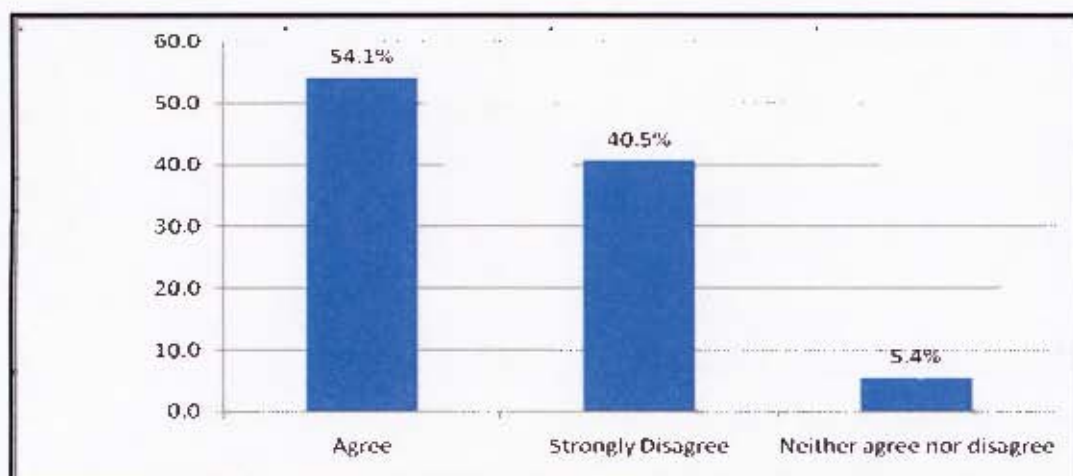
There was a question which was directed at the learning environment of the participant as to whether it enhanced the learning process. The survey showed that 62% of the participant believed that there were factors in the environment that enhanced the knowledge acquisition process. The question went further to probe the exact factors, in an open ended fashion. The thematic analysis of the open ended questions showed that some of the factors cited by the midwives included the fact that the PEP was well integrated in wards and guidelines of certain procedures are well tied to the programme. One facilitator of PEP said that facilitating perinatal up dates help her to develop her knowledge. Some nurses reported that the work in the wards as well as interaction with co-workers consolidated the theory they learnt in the maternal care programme. All the midwives felt that there are receiving support or advice about clinical skills from the programme.

**Table 3:**

Participant perception of whether the programme addressed their learning needs and fostered team spirit.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
<b>Learning needs met</b>	48.6%	48.6%	2.5%	-	-
<b>Team work and corporation</b>	35.1%	59.5%	5.4%	-	-

Participants felt that they benefited from attending the maternal care course while only 5.4% felt they were undecided about its benefits.



*Figure 4: Perceived benefit through attendance of PEP by the midwives*

Figure 4 shows the proportion of the participants who perceived that they benefited from attending the programme. In addition, all the participants agreed to strongly agree that there would recommend the programme to other midwives working in the wards at Mowbray maternal wards.

### **Content application**

Some of the participants (89%) felt that the content of the maternal care manual were applicable to their daily work in the wards. In addition, 8% of the participants were neutral, but 3% of the participants believed that the content were not applicable. In support of this, all the four supervisors agreed to strongly agreed that the midwives who have gone through the maternal care training of the PEP were able to apply their knowledge and skills. Figure 5 shows the results of the proportion of the midwives who find the PEP material applicable to their work.

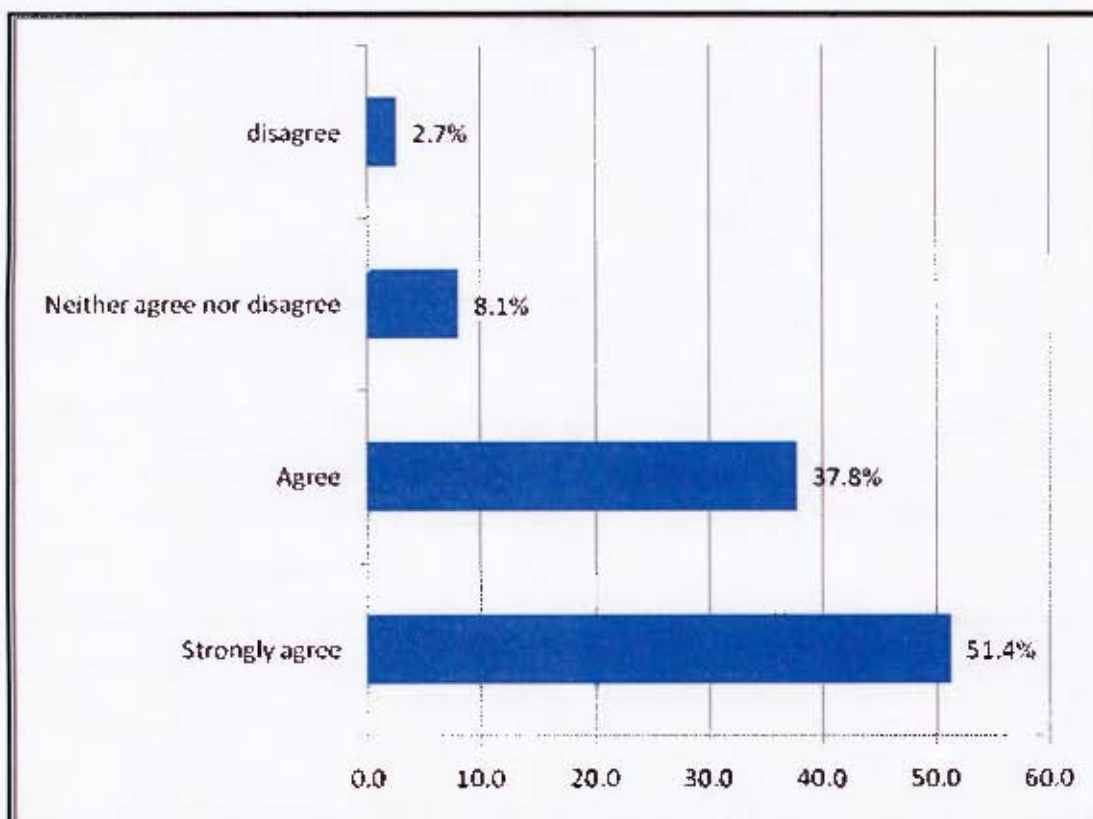


Figure 5 : Applicability of the PEP content to work environment

In addition, three of the supervisors strongly agree that the maternal care manual was appropriate for the midwives working in the wards. However, only one supervisor neither agree nor disagree. This particular supervisor felt that there is more that could be done on maternal care training and gave an example of one area, asphyxia as been too basic.

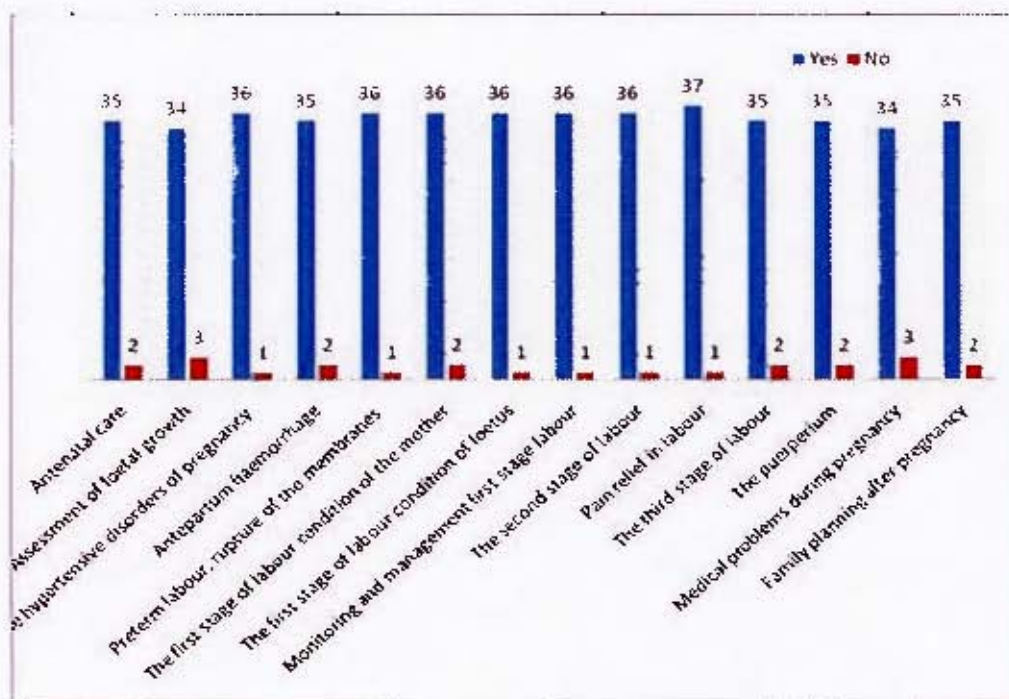


Figure 6: The number<sup>1</sup> of the midwives who reported that the theoretical topics were adequately taught.

<sup>1</sup>The number of midwives represented per topic of the maternal care manual covered that indicate whether the theoretical topics were adequately taught. The total number of midwives was 38. This number varied per topic as shown above.

### Assessment of whether the theoretical topics were covered

Figure 6 shows that most midwives felt that the theoretical topics were adequately taught. In each of the practical skills, it was noted that only a few people believed that the theoretical topics were not well taught. The assessment of foetal growth and medical problems during pregnancy were the topics that represented the highest number of midwives who felt that these topics were not adequately addressed.

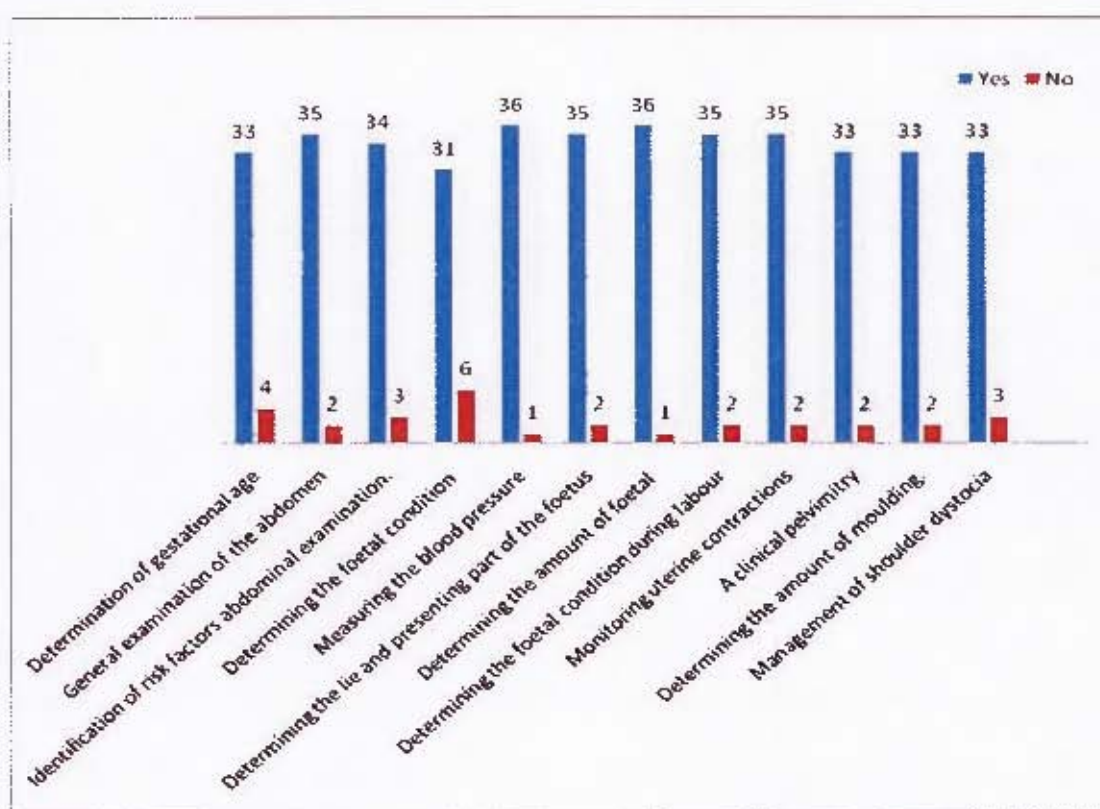


Figure 7: The number<sup>2</sup> of the midwives who reported that practical skills were adequately taught

<sup>2</sup>The number of midwives represented per topic of the maternal care manual covered that indicate whether the theoretical topics were adequately taught. The total number of midwives was 38. This number varied per topic as shown above.

The responses of the midwives suggested the practical skills of the maternal care manual were adequately covered (see figure 7). However it should be noted that a slightly higher number of midwives expressed their concerns as to whether topics such as determining foetal condition and determination of gestational age were adequately taught.

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## CHAPTER 4: DISCUSSION

The results of this study present evidence that studying the maternal care manual of the PEP increased the knowledge and skills of midwives. The findings revealed that the planned educational activities from the content material of the maternal care manual were appropriate for midwives and for purposes of improving their knowledge. Also established by this evaluation were specific areas not sufficiently covered during the training as well as problems which needed further review. The results further showed that there were other outcomes besides the increase in knowledge and skills that could be attributed to the intervention. However, some of the participants had in fact undergone some early learning initiatives before they enrolled for the programme.

### **Knowledge acquisition and learning outcomes**

Before the midwives attempted the PEP, they had a mean score of 62%. After they had gone through the PEP, this score increased to 89%. Based on the assessments of scores using the two methods used in analysis (i.e the z-test for independence scores and the t-test for paired means), there was evidence that midwives who had taken the PEP had a significant gain in knowledge (that is, z-test and t-test for paired means, the statistics are  $t(42) = 9.45, p < 0.05$  and  $t(42) = 10.6, p < 0.05$  respectively). To further substantiate these findings, the survey showed that approximately 97.2% of the participants agreed to strongly agreed that they gained new knowledge. In addition, 94% of the participants agree to strongly agree that they gained new skills.

### **Programme design**

Most of the participants acknowledged that the PEP design at Mowbray maternity hospital was appropriate for effective learning to occur. This was evident from the responses obtained in the survey. This study showed that some of the participants

(29.7%) believed the programme was not given sufficient time. This perception perhaps demonstrated the need to review the time allocated to study the modules of the maternal manual. Furthermore, some midwives believed that some of the modules and skills were not sufficiently covered in the group discussions. The skills topics which were not adequately covered were determining fetal condition and determination of gestational age and management of shoulder dystocia. The modules which were not satisfactorily covered include assessment of fetal growth and medical problems during pregnancy.

The content was pitched at the right level as participants acknowledged that they understood the content of the maternal care manual. In fact most of the midwives felt that it was user friendly and easy to understand. These findings are similar to the findings of a study conducted by Wood (1999). In that study, Woods (1999) reported that the midwives who participated the programme found the manual pitched at the right level of their understanding.

Lastly, PEP is based on the educational programme developed by Kattwinkel, et al., (1984). Although their educational model was used, the maternal care manual focuses on midwifery and therefore addresses antenatal, intra and postpartum care (Theron, 1999a). The premise which PEP was developed was such that it is a self help programme which makes it even possible for midwives working in remote areas to study the manual without assistance or supervision of a tutor. In the Mowbray study, PEP was implemented in accordance to way spelt out in the manual. Midwives were organized into small groups with a coordinator, usually a senior nurse. One notable difference stemmed from the fact that at the Mowbray maternity hospital, midwives attended group meetings where a dedicated senior nurse was appointed by the hospital to run the sessions.

### **The Mowbray study versus other similar evaluations**

The finding of this evaluation of a significant ( $t(42) = 9.45, p < 0.05$ ) gain in knowledge by exposure to the maternal care manual of the PEP was not surprising as this is consistent with the findings of several evaluations conducted in the same subject of the perinatal care, despite variations in methodological approaches and differences in composition of the target population.

The findings of the Mowbray PEP evaluation mirror the findings of a similar study by Theron (1999). In his study, Theron (1999a) used a prospective controlled trial in a region where PEP was not previously to determine whether the maternal care manual of PEP was effective in improving the knowledge of midwives. Theron (1999a) found that there was an improvement in the mean score by 32% in towns where PEP was used as an intervention compared to the controls. Despite methodological differences between the Mowbray study which used a survey and pre-and-post design and the Theron (1999a) study, it could be noted that in both cases of the Mowbray and Theron 's (1999a) study there was knowledge transfer compounded by the intervention.

In South Africa there is only one known study that exclusively evaluated the gain in skills in midwives who participated in the maternal care training. This study was conducted by Theron (1999). In this study, Theron (1999) assessed the ability of midwives to perform practical skills after completion of the maternal care manual of PEP using a prospective, controlled trial which involved a study town and two control towns. The gain in skills among the midwives was assessed before and after the intervention was administered. Improvement in clinical skills was being the only outcome and the findings showed that the skills of the midwives had significantly improved. The mean improvement was 36% in the study towns when comparing the pre-and post intervention marks.

The Mowbray study and the one by Theron (1999) were similar in terms of the intervention and the target population (in both cases midwives). In both instances, the

intervention was self instructional involved maternal care manual of PEP. However, they were differences in methodological approaches. A more superior methodology was used by Theron (1999) than Mowbray study (Lipsey, et al., 2004). The findings by Theron (1999), weighs down on the argument that gain in knowledge cannot be ruled out in the Mowbray study when the maternal care manual of the PEP was used as an intervention.

Another study that demonstrated an improvement in skills was conducted by Hesketh, et al., (1994). In this study, Hesketh, et al. looked at improvement of care among midwives who have gone through the self instructional continuing education programme. The study denoted an implementation evaluation which encompassed some observation of clinical practice. Hesketh, et al. showed that there was improvement in 55% of the aspects of clinical practice and 32% achieved the desired criteria. The average score of the pre-test score was 34% and the average post-test score was 90% and this change in scores can be regarded as good gain in skills.

Based on the findings of the Theron (1996) and Hesketh, et al., (1994), it is perhaps plausible to consider the perceived gain in skills by the midwives in the Mowbray study based on the responses in the survey though this must be treated with caution. Furthermore, the responses given by the midwives suggest that midwives who take part in PEP acknowledged skills gain and they can in addition put them into practice as evidenced by the responses that most of the midwives perceived the skills gained as applicable in their work environments.

Le Roux, Pattinson , Tsaku and Makin (1998) conducted a study in Mpumalanga Province that effectively demonstrated that successful completion of the PEP resulted in improved obstetric practice. The study by Le Roux et al. was similar to the Mowbray study in terms of the methodology which was used. The study by Le Roux et al. used the 'before-and-after' study design, to assess any changes in practice, and to monitor whether any changes occurred in the district during the time of the study. This type of study design was used by Le Roux et al. because of the limited sample size and its convenience.

The study by Le Roux et al. and the Mowbray study established that PEP was applicable to the midwives work setting. In fact, in Mowbray study, 89% of the participants found the content applicable to their work.

One must view PEP through the lenses which it was formulated. It was designed to be a distance learning programme which does not require a tutor or an instructor. In other words, it also includes both the practical and theoretical component such that the participants are able to teach themselves and one another. What still remains unknown at the Mowbray maternity hospital is whether these midwives who participate in the programme are able to apply the skills on the basis of the assessment. At the time of the study, PEP only assessed gain in theoretical knowledge because it was logistically impossible to assess practical skills.

### **Limitations**

In carrying out the analysis to establish the gain in knowledge using the pre-and-post test scores, two methods were used. The two methods treated the measuring instrument as similar or independent. Strictly speaking, a pre-and-post design uses the same instrument before and after the intervention is administered (Rossi, et al., 2004). However, an assumption was proposed which viewed the instrument as being reasonably similar to facilitate the analysis. This was based on the fact that the content in the final examination and the pre examination were the same in principle. In other words, the questions which set for the final examination were assumed to be similar to the pre-test questions.

Most studies that evaluated PEP effectiveness did not evaluate the practical skills (Theron, 1999). Similar studies that evaluated the theoretical part of PCEP but did not assess the practical skills were exemplified by two PCEP studies conducted by Kattwinkel, et al., (1979) and Kattwinkel, et al., (1997) in the United States and Poland respectively. Despite the apparent gain in skills in the Mowbray study and the aforementioned studies it is important to consider if the gain in clinical theoretical

knowledge would necessarily translate into improved skills. Apart from demonstrating the improvement of knowledge by the test scores, skills gain were only assessed from the perception of the midwives as reflected by the responses in the survey. It should be noted that no records of assessment of skills were available at the time of the analysis. From the findings of the Mowbray study, 96% of the midwives believed that they gained some skills from attending the programme.

Because of limited time and resources, the evaluation could only be conducted at Mowbray maternity hospital. This study could have been strengthened if other institutions which running the same programme had participated. If other sites were involved, a better study design such a prospective control trial could have been used. In such a controlled trial, other health facilities could have been matched to the Mowbray hospital and set aside to be used as a comparison or control. This could minimize bias and strengthen the validity of the findings. There was no control in this study and the researcher recognizes the importance of not having a control.

### **Strength of the evaluation**

The strength of the evaluation lies in the use of two different methods to collect the data from the participant, that is using the pre-and-post scores and the survey. These two methods were not different but complementary in terms of the strengthening the study. This is an example of triangulation. Triangulation indicates that more than one method was used in the study (Babbie & Mutton, 2003). It increases the validity and the credibility of the study. Apart from using the pre-and-post scores, the survey went beyond merely establishing the knowledge increase by virtue of soliciting the perception of the participants regarding the programme. This is strength in the sense that the gain in knowledge is not only statistically proven but the participants themselves also confirmed this change through the survey.

The evaluation constituted a good evaluation in line with the principles and guidelines that governs the conduct of evaluations. The PSC (2007 & 2008) argues that evaluations should contribute to improved governance in terms of transparency, accountability, inclusion and participation; should be development-oriented – nationally, institutionally and locally, this entails pro-poor orientation, service delivery and learning, Human resource and impact awareness; be undertaken ethically and with integrity in line of aspects such as confidentiality, respect, representation of competence, fair reporting; should be methodologically sound and should be operationally effective. All the aforementioned elements were visible in the Mowbray study. For instance, this evaluation provided the opportune to “learn” the effectiveness of PEP in equipping the midwives with knowledge in order to improve service delivery.

### **Conclusion and recommendations**

The study was an outcome evaluation of the maternal care training of PEP. In terms of the learning outcomes, the evaluation data suggest that this approach was successful in improving the maternal care knowledge of the midwives, and as a result quality of care of the babies. This study shows that as part of the programme design, the planned PEP activities from the content material of the maternal care manual were appropriate for midwives and for the purposes of improving their knowledge. Lastly, the study demonstrates the PEP is relevant and applicable to the in the work environment of the midwives.

For the purposes of improving the programme, the following is recommended:

1. More time should be devoted to studying each the units of the maternal care. Midwives must reach a compromise among themselves to set a suitable pace when going through the learning materials.
2. More attention needs to be directed to modules which presented substantial challenges and these modules are 1) the assessment of fetus growth and 2) medical problems during pregnancy.
3. Learning skills such as determining fetal condition, determination of gestational age and management of shoulder dystocia need more demonstrations to enhance performance.
4. Mobilizing resources for the purposes of assessing skills acquisition in maternal care training.
5. The maternal care training should be complemented by other trainings such as the newborn care. Currently, great emphasis is on the maternal care training. This important because it forms the basis for holistic care.
6. The present method which the PEP is applied at Mowbray maternity hospital is suitable for the purposes of empowering midwives with knowledge and skills.

## REFERENCES

- Babbie, E., & Mouton, J. (2003). *The practice of Social Research* (Rev. ed). Southern Africa: Oxford University Press.
- Cook, L.J. (1992). Notes from work in Poland with a Perinatal Education Programme. *Neonatal Network*, 5, 61-2.
- Davies, H., Hall, D.M.B, Harpin, V., & Pullan, C. (2005). The role of distance learning in specialist medical training. *Archives of Disease in Childhood*, 90, 279-283.
- Du Plessis, D. (2007). *Juta`s Clinical guide for midwives* (3rd ed.). Cape Town: Juta & Co Ltd.
- Harris, J. K., Yates, B., & Crosby W M. (1995). A perinatal continuing education program: its effects on the knowledge and practices of health professionals. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 24, 829.
- Kattwinkel, J., Cook, L.J., Nowacek, G.A., Ivey, H.H., & Short, J.G. (1979). Improved perinatal knowledge and care in the community hospital through a program of self-instruction. *Pediatrics*, 64, 451- 458.
- Kattwinkel, J., Nowacek, G., Cook, L., Hurt, H., & Short J. (1984). Perinatal outreach education: a continuation strategy for a basic program. *American Journal of Perinatology*, 1, 335.
- Kattwinkel, J., Nowacek, G., Cook, L.J., Pietrzyk, J., Borkowski, V., Karasinska-Urbanik, O., et al.(1997). A regionalised perinatal continuing education programme: successful adaptation to a foreign health care system and language. *Medical Education*, 31, 210-8.
- Kattwinkel, J., Cook, L.J., Nowacek, G., Bailey, B., Crosby, D., Hurt, H., et al. (2004). Review: Regionalized Perinatal Education. *Seminars in Neonatology*, 9, 155-165.

- le Roux, E., Pattinson, R., Tsaku, W., & Makin J. (1998). Does successful completion of the Perinatal Education Programme result in improved obstetric practice? *South African Medical Journal*, 88, 180-187.
- Louw, H.H., Khan, B.W., & Woods, D. (1995). Perinatal mortality in the Cape Province. *South African Medical Journal*, 85, 352-355.
- Osorno, L., Campos, M., Cook, L., Vela, G., & Dávila, J. (2006). Effectiveness of a regional self-study perinatal education programme: a successful adaptation in Yucatan, Mexico. *Medical Education*, 40, 816-823.
- Pattinson, R.C. (2001). *Why Babies die: In South African Demographic and health survey 2000*. Pretoria: Government printer.
- Pattinson, R.C., Greenfield, D., Velaphi, S., & Woods, D. (2005). Improving survival rates of newborn infants in South Africa. *Reproductive health*, 2, 1-4.
- Public Service Commission (PSC). (2007). *Report on an Audit of Government's Poverty Reduction Programmes and Projects*. Retrieved November 12, 2008 from [www.info.gov.za/view/DownloadFileAction?id=72547](http://www.info.gov.za/view/DownloadFileAction?id=72547).
- Public Service Commission (PSC). (2008). *Basic concepts in monitoring and evaluation*. Retrieved November 12, 2008 from <http://www.psc.gov.za/docs/guidelines/PSC%206%20in%20one.pdf>.
- Rossi, P., Lipsey, M.W., & Freeman, H.E. (2004). *Evaluation. A systematic approach* (7<sup>th</sup> ed.). Thousand Oaks, CA: Sage.
- Theron, G.B. (1999a). Effect of the Maternal Care Manual of the perinatal education programme on the ability of midwives to interpret antenatal cards and partograms. *Journal of Perinatal*, 19, 432-445.
- Theron, G.B. (1999b). Improved cognitive knowledge of midwives practising in the Eastern Cape Province of the Republic of South Africa through the study of a self-education manual. *Journal of Midwifery*, 15, 66-71.

United Nations. (2001). *General assembly, 56<sup>th</sup> session: Road map towards the implementation of the United Nations millennium Declaration: Report of the secretary general*. New York.

WHO. (2005). *The WHO Reproductive Health Library*. Update Software. Oxford.

Woods, D.L. (1999). An innovative training for training maternal and newborn care. *Seminar of Neonatal*, 4, 209-216.

Woods, D.L., & Theron, G.B. (1994). The Perinatal Education Programme. *South African Medical Journal*, 84, 61.

**APPENDICES**

## APPENDIX 1

### The midwives questionnaire

Dear Participant

You are being asked to participate voluntarily in a research project entitled "Evaluation of the Perinatal Education Programme (PEP)". Essentially, the aim of this study is to establish if the maternal care manual of PEP increases the knowledge and clinical skills of the practising midwives at Mowbray Maternal Hospital.

In order for me to conduct this research, I would appreciate that you complete the following survey which will take ten to fifteen minutes of your time. The survey is both anonymous and confidential.

If you have any questions or concerns about the project itself or the method used you should contact me on my cell at 0769589605 or by email at [rndalf001@mail.uct.ac.za](mailto:rndalf001@mail.uct.ac.za).

Having understood the above information, completing the survey shows that you agree to participate in this study.

Please tick the most appropriate answer to each of the questions using the code given, which gives the extent to which you either agree or disagree with the statement.

1. I found the maternal care manual user friendly.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

2. I found the language of the maternal care manual easy to understand.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

3. I acquired new skills by participating in the maternal care training of PEP.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

4. I acquired new knowledge by participating in the maternal care manual of PEP.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

5. I developed deeper understanding of the maternal care by participating in the maternal care training of PEP.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

6. I found the content I learnt from the maternal care manual applicable to my work in the wards.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

7. Participating in the maternal PEP has benefited me in my work.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

8. My learning needs in this area of maternal care were covered in the maternal care manual of the PEP.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

9. My learning needs in this area of maternal care were covered in the maternal care manual of the PEP.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

10. The small group discussions were effective training method.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

11. The Review and revision sessions were effective training methods.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

12. The general atmosphere during the maternal care manual training enhanced the learning process.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

13. The maternal care training fostered teamwork and cooperation among participants.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

14. Sufficient time was devoted to study each unit of the maternal care manual.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

15. The meetings for discussions of the maternal care manual units were scheduled at convenient times.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	-------------------------------	----------	-------------------

16. Please indicate what percentage of attendance you approximately attended in the group meetings together with fellow midwives in the maternal care training of PEP. (Tick if relevant).

- 100%
- 90%
- 80%
- 70% or less

17. In the last 12 months I have attended other maternal care courses.

Yes  No

18. Were there any other factors in the working environment that contributed to the development of these knowledge and skills covered in the maternal care manual?

Yes  No

If yes, please specify.

.....

.....

.....

.....

.....

.....

19. In what year and date did you complete the maternal care training?

(DD/MM/YEAR).....

20. I would recommend PEP programme to other midwives:

Strongly agree	Agree	Neither nor agree	disagree	Disagree	Strongly disagree
-------------------	-------	----------------------	----------	----------	----------------------

21. The units listed below were adequately covered by midwives in the group discussions. (Tick the relevant skills listed below).

Unit 1: Antenatal care

Unit 2: Assessment of foetal growth and condition   
during pregnancy

Unit 3: The hypertensive disorders of pregnancy

Unit 4: Antepartum haemorrhage.

Unit 5: Preterm labour and rupture of   
the membranes

Unit 6: The first stage of labour:   
The condition of the mother.

Unit 7: The first stage of labour:   
The condition of the foetus.

Unit 8: The first stage of labour:  
Monitoring and management.

Unit 9: The second stage of labour.

Unit 10: Pain relief in labour.

Unit 11: The third stage of labour.

Unit 12: The puerperium.

Unit 13: Medical problems during pregnancy,  
labour, and the puerperium.

Unit 14: Family planning after pregnancy.

Unit 15: Regionalized perinatal care

22. What skills have you developed from studying the maternal care manual? (Tick the relevant skills listed below).

**Antenatal care skills**

1. Determination of gestational age.
2. General examination of the abdomen.
3. Identification of risk factors.
- Abdominal examination with the uterus at 24 weeks.

4. Determining the foetal condition during the antenatal period.

**Antenatal and intrapartum care skills**

1. Measuring the blood pressure.
2. Determining the lie and presenting part of the foetus.

**Intrapartum care skills**

1. Determining the amount of foetal head palpable above the pelvic inlet.
2. Determining the foetal condition during labour.
3. Monitoring uterine contractions.
4. A clinical pelvimitry.
5. Determining the amount of moulding.
6. Management of shoulder dystocia.

23. Demographic details

For the purposes of research, it is important to capture some demographic information of the participants.

23.1 Male  female  (Tick if relevant)

23.2 In what age category do you belong? (Tick if relevant)

18-25 years

26-30 years

30-35 years

36-40 years

40+ years

24.3 How many years have you worked at Mowbray maternity Hospital? (Tick if relevant)

- Less 1 year
- 2 years
- 3 years
- 4 years
- 5 years
- More than 5 years

23.4 How many years have you worked in the midwifery profession?

- Less 1 year
- 2 years
- 3 years
- 4 years
- 5 years
- More than 5 years

23.5 What is your rank? .....

23.6 What is your home language?

- Xhosa
- Zulu
- Afrikaans
- English
- Tshwana
- Sotho
- Venda
- Other



## APPENDIX 2

### The supervisor questionnaire

Please tick the most appropriate answer to each of the questions using the code given, which gives the extent to which you either agree or disagree with the statement.

1. The midwives who have gone through the maternal care training of the PEP able to apply their Knowledge and skills.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

2. The material in the maternal care manual is appropriate for the midwives in the wards.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

3. The scheduling of the PEP is appropriate, I recommend the midwives in my ward to attend.

Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

