

LACTATION ADVISER PROGRAM: AN INTERVENTION STUDY REPORT

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1.0 EXECUTIVE SUMMARY

Breastfeeding to six months has been shown to have significant health benefits for the mother and child and economic benefits for the community. Any strategy to improve client care and education in this important area is a significant health promotion initiative. As it has been demonstrated that nurses and midwives play an influential role in lactation management, a program to enhance their ability to assist and support clients in lactation was developed.

This educational package, known as the Lactation Adviser Program (LAP), aimed to increase successful breastfeeding among clients by providing nurse and midwife participants with advanced knowledge, positive attitudes and confidence in lactation management. The program was developed in consultation with nurses and midwives with relevant certification from the International Board of Certified Lactation Consultants (IBCLC) and reviewed by an expert panel of Lactation Consultants (LC). This expert panel was chosen based on their expertise and reputation in this speciality. The program includes 24-hours of lecture content provided over 12 two-hour sessions. The LAP package includes learner outcomes, core concepts, key words, readings, revision questions, scenarios, teaching plans and overheads. Effectively the course is 60 hours duration inclusive of pre-reading material and homework activities, with the content delivered by a Lactation Consultant, or appropriate specialist. The Training Accreditation Council of Western Australia, the state body of the Australian National Training Authority (ANTA), is currently accrediting the LAP in recognition of meeting the national standard.

To determine the effectiveness of the health promotion intervention, longitudinal quantitative methodology was used in a controlled intervention with a pre-test/post-test design that included an experimental and control group. There were three time points in the study (pre-test, post-test1 and post-test2) at which the participants were required to complete a self-administered questionnaire at Fremantle and North Metropolitan Health Services to determine the participant's knowledge, attitudes and confidence in the management of breastfeeding. At each of the three time points performance concerning these variables was compared between those participants allocated to the experimental group who experienced the intervention and those

participants allocated to the control group, in the Swan Health Service, who had no intervention.

Phase One of the study

In phase one, the pre-test/post-test study design included a sample of 80, with 43 participants in the experimental group and 37 in the control group. With the alpha set at 0.05, independent *t*-tests were used to compare knowledge, attitude and confidence scores between the groups. It was found that there were no significant differences in the mean knowledge ($t=0.7$, $df=78$, $p=NS$) or attitude score ($t=0.5$, $df=78$, $p=NS$) between the control and experimental group at pre-test. However at post-test, the experimental group had a significantly higher knowledge ($t=-2.4$, $df=78$, $p<0.05$) and attitude score ($t=-3.6$, $df=78$, $p<0.00$) than the control group. In contrast the control group had a higher pre-test confidence score than the experimental group ($t=2.8$, $df=78$, $p\leq 0.00$), however, following the intervention the mean post-test score achieved by the experimental group was significantly higher than that of the control group ($t=-2.2$ $df=78$, $p<0.05$). These results demonstrate that the LAP intervention was effective, in the short term, in increasing the knowledge and confidence of participants who experienced the program. It also confirms that the program positively influenced the attitudes of the nurses and midwives involved in this health promotion initiative.

More detailed analysis of the data in phase one was conducted to review the effectiveness of the intervention with regard to the two professional groups involved; child health nurses (CHN) and midwives. Results revealed that forty-two (42) of the participants in the study were CHN and 27 were clinical midwives. Results indicated that both midwives and CHN showed an improvement in their breastfeeding knowledge following the LAP intervention. However, this improvement in knowledge after the intervention was more pronounced for midwives than CHN. The use of paired *t*-tests for within group analysis of pre/post-test scores also demonstrated that both midwives and CHN in the experimental groups improved significantly in their attitude score following the intervention. Midwives and CHN in the control groups, however, showed no significant difference in their pre/post-test attitude scores. Similarly, the confidence of CHN and midwives was increased following the LAP

intervention for both professional groups. This suggests that the health promotion initiative achieved its aim among both groups of professionals and is suitable for the broad target group for which it was developed.

In the second phase of the study participants were again contacted and asked to complete the same self-administered questionnaire six months following the initial LAP intervention. As some participants were not contactable, because they had resigned their positions in the Health Services, only those who completed questionnaires at all three time points were included in the phase two analysis.

Phase Two of the study

Sixty-one (61) participants were involved in the second phase of the study. Using repeated measures MANOVA, the between-subjects effects showed there was a significant difference in the knowledge scores of the control and experimental group participants ($F=11.4$, $df=1$, $p=0.001$). For the within-subjects effects, the univariate analysis approach showed that there was no significant difference between the knowledge scores at the three time points ($F=2.9$, $df=2$, $p=0.059$). However, the interaction between knowledge and study group was significant ($F=3.4$, $df=2$, $p=0.035$) indicating that the intervention in the experimental group had a significant effect on the number of correct responses obtained in the knowledge scale six-months following the program.

In regard to performance in attitude, the between-subjects effects showed that the experimental group participants had significantly higher attitude scores than the control group across the time periods ($F=5.1$, $df=1$, $p=0.027$). Multivariate analysis was used to test the within-subject effects and although the attitude score of the experimental group changed significantly over time ($F=4.9$, $df=2$, $p=0.011$) the interaction between the attitude score and study group was not significant. This means that although those who experienced the LAP developed more positive attitudes over the six-month period, this was not maintained consistently at each time point.

In the analysis of confidence scores, the between-subject results showed that there was no significant difference between the experimental and control groups in the confidence scores obtained by the participants across the time periods. However,

univariate analysis showed that the confidence scores of the experimental group changed significantly over time ($F=19.5$, $df=2$, $p=0.000$) as did confidence with respect to study group ($F=10.5$, $df=2$, $p=0.000$). That is, confidence was significantly higher in the experimental group participants than among the control group participants, six months following the intervention.

Overall the results of the second phase of the study were very positive in support of the Lactation Adviser Program as an effective initiative to increase knowledge and confidence and enhance positive attitudes of participants, in the long-term, in regard to breastfeeding management.

The Lactation Adviser Program is an effective health promotion package for child health nurses and midwives developed to assist them to promote breastfeeding. The recommendation is that all nurses and midwives should regularly update their knowledge and improve their attitudes and confidence in breastfeeding management. The intervention study has highlighted the need for further research in the area and it is now important to determine the optimum length of any future education courses and the frequency at which continuing education programs in lactation should be offered. There is a variety of options surrounding this issue cited in the literature with little research evidence to support the best outcome. Ultimately, there is a need for further research to explore the effect of the nurses' and midwives' lactation education to determine breastfeeding outcomes in the client population as the overall goal of any program is to increase the initiation and duration of breastfeeding.

2.0 INTRODUCTION

This study was designed to evaluate a health promotion strategy aimed at increasing nurses and midwives, knowledge, attitudes and confidence in successful breastfeeding management. The research supports the aim of the World Health Organisation (1988) to increase the rate and duration of breastfeeding and also supports a major objective of the 'Health Goals and Targets for the Year 2000 and Beyond' (Nutbeam et al., 1993). The research embraces the priorities of the Western Australian 'Public Health Action in Breastfeeding' plan for 1998-2003 which plans to increase the current rates of breastfeeding to 90% exclusively breastfeeding on hospital discharge, 80% at three months and 60% at six months (HDWA, 1998).

3.0 BACKGROUND TO THE STUDY

The important health benefits of breastfeeding for both the infant and the mother have been acknowledged over many years by researchers (Cunningham, Jellife & Jelliffe 1991; NH&MRC, 1995). Health benefits for the infant include a decrease in respiratory disorders and reduced risk of diabetes mellitus (Cunningham, Jellife & Jellife, 1991; HDWA, 1998) and for the mother, less risk of breast, cervical and ovarian cancer. In addition, there are economic benefits suggested with a projected \$11.5 million to be saved in regard to four infant illnesses, if exclusive breastfeeding rates increase from 60% to 80% at three months (Drane, 1997). At present the Australian breastfeeding rates are 85% of mothers exclusively breastfeeding on hospital discharge, 61% at three months and 49% breastfeeding at six months (Scott, Binns and Aroni, 1997). Decreases in breastfeeding rates in various regions of Australia have fallen since the mid-1980s (Lunden-Adams and Heywood, 1996) with one retrospective study showing that 64% of women fully breastfed at three months but only 36% were still breastfeeding at six months (Pawle, Downie & Juliff, 1999). Various reasons are given by the client for cessation of breastfeeding (Downie, 1999), however, failure of nurses and midwives to provide adequate and effective postnatal support and education has been suggested as a major contributing factor (Jones and West 1986). There is a role for health professionals to provide information on lactation, and this information needs to be consistent. Studies have shown that midwives often give advice contrary to the physiological process of lactation, and do not promote the initiation of natural breastfeeding techniques (Fisher, 1986). To

counter this, however, the education of nurses and midwives has been shown to be significant in reducing the conflicting advice given in the management of lactation. In addition an increased level of confidence and improved attitudes toward the management of successful breastfeeding among nurses and midwives has also been demonstrated (Cox & Turnbull, 1998a). Information and skills workshops on lactation management can provide midwives and nurses with the knowledge and confidence to support clients and equip them with accurate and consistent information necessary to initiate and maintain breastfeeding. This strategy has been shown to increase successful breastfeeding and is therefore worthy of consideration in improving outcomes (Jamieson, 1994). The proposed research, therefore, evaluates the effectiveness of a program for nurses and midwives developed specifically to address the problem of inadequate and inconsistent information in lactation management with a view to improvements in client care and nursing practice.

4.0 SIGNIFICANCE OF THE STUDY

Breastfeeding to six months has significant benefits in health and economic terms and any strategy to improve client care and education in this area is important. It has been demonstrated that nurses and midwives play an influential role in lactation management, therefore, a program to enhance their ability to assist and support clients in lactation is significant. The research determines the effectiveness of a health promotion intervention, aimed at increasing the knowledge, attitudes and confidence of nurses and midwives involved in lactation management, and is therefore beneficial in planning further programs to increase breastfeeding. Thus, information concerning the success, or otherwise, of the intervention will enable specific strategies to be developed among this group of health professionals to promote good nutrition.

5.0 AIMS AND OBJECTIVES

The aim of the study was to determine the effectiveness of the Lactation Adviser Program in assisting nurses and midwives in lactation management. The specific objectives included:

- To evaluate lactation knowledge, attitudes and confidence of nurses and midwives involved in the management of breastfeeding.

- To test an intervention aimed at improving lactation management among child health nurses and practising midwives.
- To determine whether the health promotion initiative is effective in the longer term in regard to increasing knowledge, confidence and encouraging positive attitudes of nurses and midwives.

6.0 METHOD

6.1 Research Design and Setting

Quantitative methodology was used in a controlled intervention with a pre-test/post-test design that included an experimental and control group in a longitudinal study. There were three time points in the study (pre-test, post-test1 and post-test2) at which the participants were required to complete a self-administered questionnaire at Fremantle and North Metropolitan Health Services to determine the participant's knowledge, attitudes and confidence in the management of breastfeeding. At each of the three time points performance in knowledge, attitude and confidence were compared between those participants allocated to the experimental group, who experienced the intervention, and those participants allocated to the control group in the Swan Health Service, who had no intervention.

6.2 Lactation Adviser Program (LAP) Intervention

The intervention used in the study was the Lactation Adviser Program (LAP). The aim of the program was to increase the participants' knowledge of lactation, create more positive attitudes and improve clinical confidence for the initiation and continuation of breastfeeding management. The program was developed in consultation with nurses and midwives with relevant certification from the International Board of Certified Lactation Consultants (IBCLC) and reviewed by an expert panel of Lactation Consultants (LC). This expert panel was chosen based on their expertise and reputation in this speciality.

The program includes 24-hours of lecture content provided over 12 two-hour sessions. The LAP package includes learner outcomes, core concepts, key words, readings, revision questions, scenarios, teaching plans and overheads. Effectively the course is 60 hours duration inclusive of pre-reading material and homework activities, with the content delivered by a Lactation Consultant, or appropriate specialist (eg. pharmacist,

researcher, immunologist). Overall the sessions are interactive with discussion focussed on information presented and relevant breastfeeding issues. Although participants are encouraged to complete all the activities in the program there is no formal assessment of the content. The 12 topic areas in the course include: anatomy and physiology; nutrition and biochemistry; immunology and infectious diseases; pathology, pharmacology and toxicology; psychology and sociology; growth parameters; research interpretation; ethical and legal issues including public health; breastfeeding challenges, adult learning and counselling overview.

The program has now been conducted several times in Western Australia and course evaluations have been very positive. To comply with national standards, the LAP is currently being reviewed for accreditation with the Training Accreditation Council of WA, the State body of the Australian National Training Authority (ANTA). This has been pursued to ensure credibility of the course, provide national recognition and enable wide dissemination of a product of high standard.

6.3 Sample Size and Sampling Method

All one hundred and twenty midwives and child health nurses from three metropolitan Health Services were asked to take part in the study. The experimental group comprised participants from the Fremantle and the North Metropolitan Health Services. In these areas the program was offered to all interested midwives from the maternity hospital and to child health nurses working in community health services. The Swan Health Service provided similar participants for the control group, as this area health service offered no similar professional development for nurses/midwives concerning breastfeeding during the study period. Prior to the commencement of the study an information sheet outlining the purpose and benefits of the research was distributed to the nurses and midwives and a consent form signed by each willing participant. Participants did not have formal contact with each other during the study but the possibility of contamination of subjects is acknowledged and represents a limitation in the study design. Of the 120 eligible nurses and midwives, eighty (80) participants were recruited into the first phase of the study (pre-test/post-test1) with a response rate of 67%. Forty-three (43) participants formed the experimental group and 37 were in the control group. The second phase of the study (pre-test/post-test1/post-

test2) was completed by 61 participants, 28 in the control group and 33 in the experimental group.

6.4 Instrument

The self-report questionnaires completed at pre-test, post-test1 and at post-test2, included demographic information, current position of the nurses and midwives, work experience, education and clinical setting. The tool also included a knowledge scale, attitude scale and questions related to participant's confidence in lactation management. The questionnaire developed by the researchers was based on the literature and involved adaptation of similar knowledge and attitude questions to those used in previous research (Jamieson, 1994; Cox & Turnbull, 1998). The knowledge component comprised 16 multiple choice questions, with four possible responses, and involved short scenarios covering topic areas such as the physiology of lactation, immunology, pharmacology, correct positioning and attachment and management of breastfeeding problems. The final knowledge score was based on the number of correct responses, with the highest possible score being 16. The attitude component consisted of 15 items with responses rated on a five point Likert scale (1=totally disagree, 2=disagree, 3=neutral, 4=agree and 5=totally agree). Attitude questions were used to illicit the participants beliefs concerning their support of breastfeeding and included items such 'an evening complementary feed helps the infant to sleep through the night', 'breastmilk and modern formulas are almost the same', 'health professionals need to assist attachment of the infant to the breast for the first two days', 'promoting breastfeeding to clients often sets them up for guilt feelings and/or failure when not achieved', 'breastfeeding can be too restrictive on modern lifestyles', and 'proficient health professional assistance is the most important factor in the establishment of successful breastfeeding'. Similarly, the confidence component consisted of seven items with responses rated on a five point Likert scale (1=not confident at all, 2=not confident, 3=neutral, 4=confident, 5=very confident) and covered questions related to the participant's lactation management skills.

The questionnaire was reviewed by nurses and midwives qualified as Lactation Consultants (IBCLC), including one LC with experience in the formulation of examination questions for the IBCLC. This was to ensure content validity and it was agreed the tool measured knowledge, attitudes and confidence in lactation

management. Pilot testing of the adapted instrument with a small sample resulted in minor refinements to the survey tool in terms of wording and order of questions. The instrument was then suitable for the main survey.

6.5 Data Collection

The procedure for the study was, in phase one, to develop the Lactation Adviser Program and recruit participants for the research in both the experimental and control groups. Essentially the participants were self-selecting, and although this represents a weakness in the study design, it was the same for both groups. Following written consent, all participants were asked to complete a self-administered questionnaire (pre-test). Nurses and midwives in the experimental group then completed the 12-week LAP intervention program while the control group received no additional formal education. At the end of the program participants in the experimental group and control group completed the first post-test questionnaire (post-test1). This same questionnaire was repeated six months after the intervention (post-test2) to evaluate the long-term effect of the program. At each of the three time points the questionnaires were forwarded to the allocated co-ordinator in each Health Service and returned to the researchers via mail, thereby ensuring anonymity and confidentiality. To ensure the maximum response rate co-ordinators also followed-up participants with a phone call reminder to encourage return of the questionnaires.

6.6 Analysis

Upon completion of the data collection, all questionnaires were coded ready for data entry. The Statistical Package for Social Sciences (SPSS Version 10.0) was used to analyse the data from all of the self-administered questionnaires. Descriptive and inferential statistical analysis of the data was undertaken, including the appropriate parametric and non-parametric tests. Chi-Square (χ^2) test was used to determine if differences in frequency existed across response categories. Within group and between group comparisons were performed using Student's paired and independent *t*-tests, respectively. One-Way Analysis of Variance was used to determine differences between three or more groups and repeated measures MANOVA was used to test for within-subject differences over time.

7.0 RESULTS - PHASE I

7.1 Sample Characteristics

The average age of the 80 participants in the study was 47.4 ($SD=8.9$) years and the average number of years clinical experience was 22.3 ($SD=8.8$) years. Forty-six percent (46%) of participants had hospital-based training, 50% had a tertiary qualification and 4% did not answer the question. Further education was undertaken by 81% of the participants compared to 19% who had no further education. More specifically, continuing education in the area of lactation was completed by 49% of the participants while 51% had undertaken no previous lactation education. The current employment position of participants included 27 midwives, 42 CHN and 10 other, with one participant failing to address the question. There were 42 participants classed as level two registered nurses, 18 as level one, five as level three and eight as other. Forty-six percent (46%) of the participants were in full-time employment, 49% in part-time and 4% casuals with 1% not having answered the question.

7.2 Control and Experimental Group

There were 43 participants in the experimental group and 37 in the control group. No significant differences were found between the two in age, 47.9 years ($SD=8.1$) for control group compared to 47.0 years ($SD=9.6$) for the experimental group ($p=NS$) or years of clinical experience, 22.7 years ($SD=8.5$) for the control group compared to 22.0 years ($SD=9.1$) for the experimental group ($p=NS$). The number of participants whose highest level of education was hospital based was not significantly different from the number with a combination of hospital based and tertiary, tertiary or other as the highest level of education, in both the control and experimental group ($\chi^2=1.15$, $p=NS$). The number of participants who completed nursing courses or had further education in lactation was not statistically different between the control and experimental group.

7.3 Knowledge

The pre-test correct knowledge score for the 80 participants ranged from 1 to 10 from a possible score of 16 ($M=6.5$, $SD=1.8$). Using an independent t -test to compare the knowledge scores between the control and experimental group, it was found that there were no significant differences in the mean knowledge score between the control

($M=6.7$, $SD=1.6$) and experimental group ($M=6.4$, $SD=2.0$) at pre-test ($t=0.7$, $df=78$, $p=NS$). However, at post-test the experimental group ($M=8.2$, $SD=2.3$) had a significantly higher knowledge score than the control group ($M=7.1$, $SD=1.7$; $t=2.4$, $df=78$, $p<0.05$) (see Table 1). The mean difference in pre-test and post-test correct knowledge score was significantly different for the experimental ($M=1.8$, $SD=3.1$) and the control group ($M=0.4$, $SD=2.0$; $t=-2.3$, $df=78$, $p=0.02$).

Table 1. Correct knowledge score for control and experimental group

Knowledge Score	Control Group (n=37)	Experimental Group (n=43)	p
Pre-test	6.7 (1.6)	6.4 (2.0)	NS
Post-test	7.1 (1.7)	8.2 (2.3)	<0.05

A paired t-test was used to compare the control group pre-test/post-test knowledge score (see Table 2) and showed that the group had similar pre-test ($M=6.7$, $SD=1.6$) and post-test scores ($M=7.1$, $SD=1.7$; $t=-1.3$, $df=36$, $p=NS$) for knowledge. However, in the experimental group the post-test knowledge score was significantly higher ($M=8.2$, $SD=2.3$) compared to the pre-test score ($M=6.4$, $SD=2.0$; $t=-3.8$, $df=42$, $p\leq 0.00$). This indicates a marked improvement in the breastfeeding knowledge of the LAP participants following the LAP intervention.

Table 2. Pre-test and post-test correct knowledge score

Study Group	Pre-test	Post-test	p
Control (n=37)	6.7 (1.6)	7.1 (1.7)	NS
Experimental (n=43)	6.4 (2.0)	8.2 (2.3)	<0.00

7.4 Attitude

Performance on attitude was scored with 75 rated as being the most positive score. The pre-test attitude score for the 80 participants ranged from 44 to 66 ($M=55.9$, $SD=4.4$). Both the control and experimental group achieved similar pre-test attitude

scores, 56.2 ($SD= 4.1$) and 55.7 ($SD= 4.8$) respectively ($t=0.5$, $df=78$, $p=NS$) See Table 3. However, the post-test attitude score was significantly higher for the experimental group ($M=58.7$, $SD=3.7$) than the control ($M=55.6$, $SD=3.9$; $t=-3.6$, $df=78$, $p<0.00$). The difference in pre-test/post-test attitude scores between the experimental ($M=3.1$, $SD= 4.2$) and control group ($M=-0.6$, $SD= 4.8$) was statistically significant ($t=-3.6$, $df=78$, $p\leq 0.00$).

Table 3. Attitude scores for control and experimental group

Attitude Score	Control Group (n=37)	Experimental Group (n=43)	p
Pre-test	56.2 (4.1)	55.7 (4.8)	NS
Post-test	55.6 (3.9)	58.7 (3.7)	<0.01

Within group analysis showed the experimental group achieved a significantly higher attitude score at post-test ($M=58.7$, $SD=3.7$) than at pre-test ($M=55.7$, $SD=4.8$; $t=-4.8$, $df=42$, $p\leq 0.00$). See Table 4. The control group, however, showed no significant difference between pre-test ($M=56.2$, $SD=4.1$) and post-test attitude scores ($M=55.6$, $SD= 3.9$; $t=0.7$, $df=36$, $p=NS$).

Table 4. Pre-test and post-test attitude scores

Study Group	Pre-test	Post-test	p
Control (n=37)	56.2 (4.1)	55.6 (3.9)	NS
Experimental (n=43)	55.7 (4.8)	58.7 (3.7)	≤ 0.00

7.5 Confidence

The pre-test confidence score for the 80 participants ranged from 10 to 34 from a possible score of 35 ($M=23.8$, $SD=4.1$). Table 5 shows the comparison in confidence scores for the control and experimental group. The control group had a higher pre-test confidence score ($M=25.1$, $SD= 3.5$) than the experimental group ($M=22.7$, $SD= 4.2$;

$t=2.8$, $df=78$, $p\leq 0.00$). However, the mean post-test score achieved by the experimental group ($M=27.4$, $SD=4.2$) was significantly higher than that of the control group ($M=25.5$, $SD=3.7$; $t=-2.2$, $df=78$, $p<0.05$). The mean difference in the pre-test/post-test confidence scores between the control ($M=0.4$, $SD=3.6$) and experimental group ($M=4.8$, $SD=4.4$; $t=-4.9$, $df=78$, $p\leq 0.00$) was also statistically significant.

Table 5. Confidence scores for the control and experimental group

Confidence Score	Control Group (n=37)	Experimental Group (n=43)	p
Pre-test	25.1 (3.5)	22.7 (4.2)	<0.01
Post-test	25.5 (3.7)	27.4 (4.2)	<0.05

Within group comparison of the mean confidence score showed no significant difference in the control group pre-test ($M=25.1$, $SD=3.5$) compared to post-test ($M=25.5$, $SD=3.7$; $t=-0.6$, $df=36$, $p=NS$). See Table 6. However, the experimental group had an improvement in their post-test confidence score ($M=27.4$, $SD=4.2$) compared to the pre-test confidence score ($M=22.7$, $SD=4.2$) that was statistically significant ($t=0.7$, $df=42$, $p\leq 0.00$).

Table 6. Pre-test and post-test confidence scores

Study Group	Pre-test	Post-test	p
Control (n=37)	25.1 (3.5)	25.5 (3.7)	NS
Experimental (n=43)	22.7 (4.2)	27.4 (4.2)	≤ 0.00

7.6 Midwives and Child Health Nurses

7.6.1 Sample Characteristics

The data in phase one was analysed further to compare the effectiveness of the LAP for the individual professional groups involved in the study; midwives and child health nurses.

There were 69 participants in phase one of the study who were employed as either clinical midwives or child health nurses. The average age of the participants was 47 years ($SD=9$) with an age range of 25 to 64 years, while the average number of years clinical experience was 22 years ($SD=9$) with a range of 4 to 40 years. Forty-two (42) of the participants were CHN and 27 were midwives. The CHN were significantly older than midwives, 49 years ($SD=8$) compared to 44 years ($SD=9$) respectively ($p=0.015$) and had more years of clinical experience, 24 years ($SD=8$) for CHN and 19 years ($SD=10$) for midwives ($p=0.036$). Seventy-eight percent (78%) of midwives had hospital-based training, 15% had tertiary qualifications and 7% had postgraduate qualification. Among the CHN, 30% had hospital based training, 52% had tertiary qualification and 18% had postgraduate qualification. Fifty percent (50%) of midwives and 52% of CHN undertook education in the area of lactation. Part-time employment was more prevalent (73%) than full-time employment (27%) in midwives, while in CHN the prevalence of part-time (44%) and full-time (56%) employment was similar ($\chi^2=5.49$, $df=1$, $p=0.019$). Sixty seven percent (67%) of midwives were registered level one, 30% were registered level two and 4% were registered level three while 86% of CHN were registered level two and 14 % were registered level three. The 69 study participants were assigned to either a control group ($n=33$) or an experimental group ($n=36$). Fourteen (14) midwives and 19 CHN were in the control group while 13 midwives and 23 CHN were included in the experimental group.

7.6.2 Pre-test/Post-test Scores

Knowledge

A paired t-test was used to compare the pre-test/post-test knowledge score of midwives and CHN in the control and experimental group (see Table 7). Midwives in the control group showed no significant difference in their pre-test and post-test

scores ($M=7.4$, $SD= 1.7$) vs ($M=6.9$, $SD= 1.4$; $t=-0.8$, $df=13$, $p=NS$). However, midwives in the experimental group showed a significantly higher knowledge score at post-test ($M=9.2$, $SD= 2.0$) than pre-test ($M=6.0$, $SD= 2.2$; $t=-4.6$, $df=12$, $p=0.001$). Among CHNs, the control group had similar pre-test ($M=6.7$, $SD= 1.8$) and post-test knowledge scores ($M=7.0$, $SD= 1.6$; $t=-0.7$, $df=18$, $p=NS$). In contrast the experimental group had a higher post-test ($M=8.3$, $SD= 2.3$) than pre-test score ($M=7.0$, $SD=2.0$; $t=-1.8$, $df=22$, $p=NS$), though not statistically significant. These results indicate that both midwives and CHN showed an improvement in their breastfeeding knowledge following the LAP intervention. However, this improvement in knowledge after the intervention was more pronounced for midwives than CHN.

Table 7. Pre-test/post-test knowledge score of midwives and CHN in control and experimental group

	Study Group	Pre-test	Post-test	p
Midwives	Control (n=14)	6.9 (1.4)	7.4 (1.7)	NS
	Experimental (n=13)	6.0 (2.2)	9.2 (2.0)	0.001
CHN	Control (n=19)	6.7 (1.8)	7.0 (1.6)	NS
	Experimental (n=23)	7.0 (2.0)	8.4 (2.3)	NS

Table 8. Pre-test/post-test attitude score of midwives and CHN in control and experimental group

	Study Group	Pre-test	Post-test	p
Midwives	Control (n=14)	56.9 (4.9)	57.2 (4.0)	NS
	Experimental (n=13)	56.5 (3.9)	59.5 (2.7)	0.024
CHN	Control (n=19)	56.0 (3.6)	54.5 (3.6)	NS
	Experimental (n=23)	55.5 (5.0)	58.5 (3.6)	0.008

7.6.3 Attitude

A paired t-test for within group analysis of pre/post-test scores showed that both midwives and child health nurses in the control groups showed no significant difference in their pre/post-test attitude scores. However, in the experimental groups the midwives and CHN had improved significantly in their attitude score following

the intervention (Table 8). More positive attitudes in the experimental group were evident in both groups following the LAP intervention.

7.6.4 Confidence

Within group comparison of the mean confidence scores were not significantly different for midwives in the control group pre-test ($M=25.2$, $SD= 3.5$) compared to post-test ($M=26.0$, $SD= 3.5$; $t=-0.7$, $df=13$, $p=NS$). See Table 9. However, midwives in the experimental group improved in their level of confidence, as indicated by the significant increase in their confidence scores from $M=22.1$ ($SD= 3.2$) at pre-test to $M=27.2$ ($SD= 1.7$) at post-test ($t=-5.8$, $df=12$, $p=0.000$). CHN in the control group showed no difference in their pre-test score ($M=24.5$, $SD=3.2$) compared to their post-test score ($M=24.4$, $SD= 3.6$; $t=0.1$, $df=18$, $p=NS$). In the experimental group, however, CHN showed a significant improvement in their confidence, with a score of $M=23.7$ ($SD= 4.1$) at pre-test and a post-test score of $M=28.2$ ($SD= 5.2$; $t=-4.0$, $df=22$, $p=0.000$).

Table 9. Pre-test/post-test confidence score of midwives and CHN in control and experimental group

	Study Group	Pre-test	Post-test	p
Midwives	Control (n=14)	25.2 (3.5)	26.0 (3.5)	NS
	Experimental (n=13)	22.1 (3.2)	27.2 (1.7)	0.000
CHN	Control (n=19)	24.5 (3.2)	24.4 (3.6)	NS
	Experimental (n=23)	23.7 (4.1)	28.2 (5.2)	0.001

7.7 RESULTS - PHASE II

In the second phase of the study participants were again contacted and asked to complete the same self-administered questionnaire six months following the initial LAP intervention. Although some participants were not contactable because they had resigned from the Health Services involved, the response rate was satisfactory for the longitudinal approach. Hence, only those who completed questionnaires at all three time points were included in the final analysis.

7.7.1 Sample Characteristics

The average age of the 61 participants in the study was 48.5 ($SD= 8.7$) years and the average number of years clinical experience was 23.3 ($SD= 9.1$) years. Fifty-four percent (54%) of participants had hospital-based training and 5% had a tertiary qualification. Further education was undertaken by 84% of the participants compared to 16% who had no further education. More specifically, continuing education in the area of lactation was completed by 53% of the participants while 47% had undertaken no previous lactation education. The current employment position of participants included 18 midwives, 36 CHN and 6 other, with one participant failing to address the question. There were 40 participants classed as level two registered nurses, 11 as level one, five as level three and five as other. Thirty percent (30%) of the participants were in full-time employment, 28% in part-time and 3% in casual employment.

7.7.2 Control and Experimental Group

There were 33 participants in the experimental group and 28 in the control group. No significant differences were found between the two groups in regard to the age of the control group ($M=49.3$, $SD= 7.9$) compared to the age of the experimental group ($M=47.8$, $SD= 9.4$; $p=NS$) or the years of clinical experience for the control group ($M=22.3$, $SD= 9.4$) compared to the experimental group ($M=24.5$, $SD= 8.9$; $p=NS$). The number of participants whose highest level of education was hospital based was not significantly different from the number with a combination of hospital based and tertiary, tertiary or other as the highest level of education, in both the control and experimental group ($\chi^2=4.60$, $p=NS$). The number of participants who completed nursing courses or had further education in lactation was not statistically different between the control and experimental group. That is, the control and experimental groups were shown to be the same for all demographic variables.

7.7.3 Knowledge

The pre-test correct knowledge score for the 61 participants ranged from 2 to 10 from a possible score of 16 ($M=6.8$, $SD=1.8$). Using an independent t -test it was found that there was no significant difference in the mean knowledge score between the control ($M=6.8$, $SD=1.6$) and experimental groups ($M=6.8$, $SD=1.9$) at pre-test

($t=-0.06$, $df=59$, $p=0.95$). Table 10 shows the mean correct knowledge score at pre-test, post-test1 and post-test2 for the control group and experimental group.

Table 10. Mean knowledge scores over time for control and experimental group

Study Group	Pre-test	Post-test1	Post-test2
Control (n=28)	6.8 (1.6)	7.1 (1.9)	6.4 (2.2)
Experimental (n=33)	6.8 (1.9)	8.4 (2.2)	8.4 (2.9)

The results from testing the between-subject effect, study group, showed that there was a significant difference in the knowledge scores between the two study groups ($F=11.4$, $df=1$, $p=0.001$). The power for this comparison was 0.91. This showed there was an overall difference in the knowledge of the experimental and control groups with the experimental group demonstrating a higher mean knowledge score than the control group (Table 11). The univariate analysis approach was used to test the within-subject factor, knowledge, and the interaction of within-subject factor and between-subject factor, knowledge and study group (Mauchly's test of sphericity was not significant, $p=0.554$). The results showed that there was no significant difference between the knowledge scores at the three time points ($F=2.9$, $df=2$, $p=0.059$). However, the effect of both knowledge and study group was significant ($F=3.4$, $df=2$, $p=0.035$), indicating that the intervention in the experimental group had a significant effect over time on the number of correct knowledge scores obtained. Within-subject contrasts showed that the change in knowledge scores from pre-test to post-test2 was linear ($F=5.9$, $df=1$, $p=0.090$). The estimated mean knowledge scores over the three time periods for the control and experimental group are shown in Table 11. The knowledge score for the experimental group was significantly higher than for the control group, indicating that the intervention had a significant impact on the knowledge scores achieved by the participants in the experimental group over the six-month period.

Table 11. Estimated Marginal Means

Study Group	Mean (SE)	95% Confidence Interval	
		Lower Bound	Upper Bound
Control (n=28)	6.8 (0.2)	6.3	7.2
Experimental (n=33)	7.9 (0.2)	7.4	8.3

7.7.4 Attitude

Performance in attitude was scored with 75 rated as being the most positive score. The pre-test attitude score for the 61 participants ranged from 44 to 65 ($M=56.0$, $SD=4.3$). Both the control and experimental group achieved similar pre-test attitude scores, 56.0 ($SD= 3.6$) and 56.0 ($SD= 4.9$), respectively ($t=-0.03$, $df=59$, $p=0.98$). Table 12 shows the mean attitude score at pre-test, post-test1 and post-test2 for control group and experimental group.

Table 12. Mean (*SD*) attitude scores for control and experimental group

Study Group	Pre-test	Post-test1	Post-test2
Control (n=28)	56.0 (3.6)	55.6 (0.6)	54.8 (3.6)
Experimental (n=33)	56.0 (4.9)	58.7 (0.6)	57.8 (7.5)

Analysis of the between-subject effect showed that study group had a significant effect on the attitude scores obtained by the participants ($F=5.1$, $df=1$, $p=0.027$). The power for this comparison was 0.60. The experimental group reported significantly higher attitude scores across the time periods than the control group (Table 13). Multivariate analysis was used to test the within-subject effects (Mauchly's test for sphericity was significant, $p=0.000$). The results showed that the attitude scores changed significantly over time ($F=4.9$, $df=2$, $p=0.011$), decreasing for the control group overall and increasing then decreasing for the experimental group. However, the interaction between attitude score and study group was not statistically significant over time ($F=3.0$, $df=2$, $p=0.060$). The estimated mean attitude score for the two study groups are shown in Table 13. The attitude scores for the experimental group were higher than for the control group at both post-test1 and post-test2, indicating that the

intervention had improved the attitude scores in the experimental group but the effect was not maintained consistently at each time point.

Table 13. Estimated Marginal Means

Study Group	Mean (SE)	95% Confidence Interval	
		Lower Bound	Upper Bound
Control (n=28)	55.7 (0.6)	54.5	56.9
Experimental (n=33)	57.6 (0.6)	56.4	58.7

7.7.5 Confidence

The pre-test confidence score for the 61 participants ranged from 14 to 34 from a possible score of 35 ($M=24.4$, $SD=3.7$). The control group had a higher pre-test confidence score of $M=25.5$ ($SD=3.7$) than the experimental group that scored $M=23.4$ ($SD=3.4$; $t=2.4$ $df=59$, $p=0.023$). Table 14 shows the mean confidence score at pre-test, post-test1 and post-test2 for control group and experimental group.

Table 14. Mean (SD) confidence scores for control and experimental group

Study Group	Pre-test	Post-test1	Post-test2
Control (n=28)	25.5 (3.7)	25.5 (0.6)	26.7 (3.1)
Experimental (n=33)	23.4 (3.4)	27.4 (0.6)	28.7 (3.2)

The between-subject results showed that study group did not have a significant influence on the confidence scores obtained by the participants overall ($F=0.87$, $df=1$, $p=0.354$). Box's test for equality of covariance matrices showed that the observed covariance matrices of the dependent variables were equal across groups (Box's $M=5.27$, $p=0.557$). Mauchly's test of sphericity was not significant ($p=0.63$), therefore univariate analysis was used to assess within-subject effect and showed that confidence scores over time changed significantly ($F=19.5$, $df=2$, $p=0.000$) as did confidence with respect to study group ($F=10.5$, $df=2$, $p=0.000$). This means that the experimental group participants increased their confidence across the time periods and the experimental group achieved significantly higher results than the control group. From Table 15 the estimated marginal means for the two study groups over the three

time periods showed confidence was significantly higher in the experimental group than the control group.

Table 15. Estimated Marginal Means

Study Group	Mean (SE)	95% Confidence Interval	
		Lower Bound	Upper Bound
Control (n=28)	25.9 (0.5)	24.9	27.0
Experimental (n=33)	26.6 (0.5)	25.7	27.6

8.0 DISCUSSION and RECOMMENDATIONS

In the findings of the first phase of the study there was no difference in age, years of experience or previous education between the participants from the Fremantle and North Metropolitan Health Services who formed the experimental group and those from Swan Health Service who formed the control group. Consequently, in terms of demographic variables both groups share the same characteristics.

8.1 Knowledge

Although little has been reported in the recent Australian literature concerning the actual knowledge and attitudes of nurses and midwives the current study illuminates the attributes of practitioners. The study shows that although both groups were similar in relation to their knowledge of lactation prior to the intervention neither the experimental or control groups had extensive knowledge based on the 16 knowledge questions constructed by the researchers and Lactation Consultants involved in designing the tool. This is disturbing given that these health professionals work closely with mothers everyday to assist them with breastfeeding, yet they have serious deficits in their knowledge base. The finding is not unexpected, however, and supports previous research that indicates nurses and midwives lack adequate knowledge to support the initiation and maintenance of lactation (Jamieson, 1994). What is encouraging is that the findings clearly demonstrate the significantly improved knowledge of the experimental group following the LAP intervention. Similarly, a Brazilian study showed an increase in student's knowledge following an 18-day course on breastfeeding, with higher correct knowledge scores than the current

study, although the difficulty of the questions could not be assessed (Westphal, Taddei, Venaccio & Bogus, 1995). Consistent with the current findings an Australian study (n=65) demonstrated increased breastfeeding knowledge of participants following two workshops held over a two month period (McIntyre & Lawlor-Smith, 1996). Canadian research has also shown an increase in breastfeeding knowledge following a one and a half-hour workshop (Martens, 2000). The previous research, although in support of the current study provide no consistency, however, concerning the optimal timeframe for educational workshops in order to increase breastfeeding knowledge and it appears this is an area for potential research.

What is known from the current study, however, is that more education, on an ongoing basis, is necessary to increase the nurses' and midwives' knowledge to an advanced level. It is argued that this group of health professionals, who work constantly with breastfeeding mothers, require knowledge consistent with that of specialists in the area, regardless of whether or not they are IBCLC certified.

The results of phase two of the study are encouraging and indicate that participants retained their increased knowledge of lactation six months after the LAP. However, the mean score of 8.4 at post-test₂ for the experimental group, from a possible score of 16, further supports the notion of follow-up education as essential to improve knowledge. Previous quantitative research with a small sample (n=39) also demonstrated an increase in breastfeeding knowledge 7 months after a mandated breastfeeding education session for nursing staff, but the researchers acknowledge the need for on-going, specifically targeted education (Martens, 2000). A single educational experience has also been previously reported by Cox and Turnbull (1998) to be insufficient to enable nurses to provide specialist care in breastfeeding with ongoing annual education recommended. Hence, it is evident that nurses and midwives require more than one opportunity to update their knowledge and confidence concerning breastfeeding.

It is clear from the present study that although participants in the intervention group improved their knowledge and maintained this improvement over a six-month timeframe they appear not to have the advanced level of lactation knowledge required to promote breastfeeding effectively in practice. One possible explanation for this

may be the unprecedented explosion in the amount of information and research published in lactation in recent years. As the average age of the nurses and midwives in the study is 47 years with only half having completed tertiary studies and a similar percentage involved in previous lactation education it is not surprising that the baseline knowledge of lactation was not satisfactory. While the LAP is an effective educational resource to improve participant's knowledge the findings suggest reinforcement of the educational objectives in repeated sessions may be one way to ensure health professionals have appropriate lactation knowledge to the required level.

8.2 Attitude

The study supports the contention of both Long (1995) and Jamieson (1994) that midwives need an opportunity to explore their attitudes in relation to breastfeeding as well as to update their knowledge to ensure an accurate knowledge base. Researchers acknowledge that the attitudes, knowledge and communication of health professionals has a powerful effect on the mother's confidence in breastfeeding, particularly in relation to the initiation of breastfeeding (Henderson, Pincombe & Stamp, 2000; Stein, Dykes & Bramwell, 2000; Becker, 1992; Fletcher & Harris, 2000).

The attitude scale shows that nurses' and midwives' attitudes in regard to lactation were generally quite positive, with the pre-test revealing a satisfactory mean score for both the experimental and control groups. Following the educational intervention, however, the mean attitude score significantly increased for the experimental group, which confirms that the program positively influenced the attitudes of participants. This is noteworthy because the attitude score of the control group did not change significantly. The program therefore is instrumental in improving the positive attitudes of LAP participants. This finding is of paramount importance in light of the results of Stein, Dykes and Bramwell (2000). Their study of 40 midwives, using critical incident technique, confirmed that appropriate attitudes are necessary to support and empower breastfeeding mothers. Nurses' positive attitudes have also been highlighted elsewhere in the literature as vital in assisting mothers to breastfeed (Long, 1995) so any initiative to improve attitudes must be seen as beneficial.

Over the six-month period breastfeeding attitudes changed positively for the intervention group with a significant difference noted between the control and experimental groups. Although at pre-test the attitude score of both groups was

similar, six months later the attitudes of those in the control group had decreased while those in the experimental group has risen at post-test1 and fallen slightly at post-test2, although remaining higher than the baseline. This indicates that while attitudes were more positive for those who completed the LAP this finding was not maintained consistently over the three time points. The results, however, are quite promising compared to Martens (2000) study of breastfeeding attitudes 7 months after an educational intervention. She was unable to demonstrate any change in breastfeeding attitudes over time for either the control or experimental group. In interpreting the findings of the current study it is necessary to consider the difficulty of impacting attitudes through education alone. Thus, the fact that nurses and midwives who participated in the LAP did develop more positive attitudes signifies the ability of the educational program to engage practitioners in reflection about lactation management.

By examining their own attitudes midwives and nurses are better able to assist mothers with lactation and enhance breastfeeding success through reflection and enlightened exchange (Long, 1995). While the LAP has been shown to be effective in creating more positive attitudes further structured dialogue with colleagues, in the form of monthly interactional case studies, are recommended. The LAP intervention includes strategies to assist attitudinal change but further and continued development of health professionals in this way will support and nurture the promotion of a positive approach.

8.3 Confidence

Overall the findings show that all participants in the study were moderately confident in their management of lactation, which is to be hoped of advanced practitioners. Interestingly, the control group had significantly more confidence in the management of lactation than the experimental group initially. This is not easily explained but may relate to the perceived self-efficacy of some individuals within the group. What is evident from the findings, however, is that the experimental group were more confident following the LAP intervention when compared to the control group, with statistically significant results, even though the experimental group participants started with a lower mean score. This indicates that the program was effective in

increasing the confidence of participants to enable them to be more confident in supporting clients.

In the study the between-subject results show that initially being in the control group or the experimental group did not significantly influence the confidence scores achieved by participants. However, over a six-month timeframe, there was an increase in the confidence of participants involved in the LAP compared to the control group. This means that those nurses and midwives involved in the education continued to benefit long after the program was completed as their confidence in lactation management continued to improve. This is an important point given the initial findings at pre-test which show that the control group was more confident than the experimental group. It is clear that the LAP not only provides participants with knowledge and offers the opportunity to reflect on attitudes to lactation, but also provides a sense of self-efficacy that ensures the nurses and midwives have a more confident approach to their work with breastfeeding mothers.

8.4 Summary

In order to enhance understanding of the impact of programs such as the LAP, further research is needed to explore the effect of the nurses' and midwives' education on breastfeeding outcomes in the client population. It is also important to determine the optimum length of any future education courses and the frequency at which continuing education programs in lactation should be offered, as there is a variety of options cited in the literature with little research evidence to support the best outcome.

Although the design of the current study limits the generalisability of the findings to all nurses and midwives, the LAP has been shown to be effective with this sample. All attempts were made by the researchers to reduce the potential for bias but the limitations of the study design are acknowledged.

If nurses and midwives are to be instrumental in supporting and educating clients to increase the initiation and duration of breastfeeding then they need to have current, accurate knowledge, positive attitudes and be very confident in their role. On the basis of the findings, the Lactation Adviser Program is effective in providing participants with information to improve their knowledge, enhance more positive and supportive

breastfeeding attitudes, and increase their confidence in lactation management upon successful completion of the educational intervention, and into the future.

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11.0 APPENDICES

PRE-TEST QUESTIONNAIRE OF THE LACTATION ADVISER PROGRAM

DEMOGRAPHIC DATA

Please answer the following questions by filling in the space provided or ticking the box.

		Office use
	CODE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	(1-3)
1.	What is your age in years? _____ years	(4-5)
2.	Describe your highest level of nurse education?	(6)
	Hospital based <input type="checkbox"/>	
	Tertiary degree <input type="checkbox"/>	
	Hospital based with a post registration tertiary course <input type="checkbox"/>	
	Postgraduate degree <input type="checkbox"/>	
	Other _____	
3.	Other nursing courses undertaken, or qualifications attained?	(7-9)

4.	How many years post registration clinical experience have you had?	(10-11)
	_____ years.	
5.	Have you participated in any previous continuing education in the area of lactation, in addition to your nursing qualifications?	(12-13)
	Yes <input type="checkbox"/>	
	No <input type="checkbox"/>	
	Describe _____	
6.	What is your current position?	(14)
	Midwife <input type="checkbox"/>	
	Child Health nurse <input type="checkbox"/>	
	Other _____	
7.	What is your current level in nursing?	(15)
	Registered nurse: Level 1 <input type="checkbox"/>	
	Registered nurse: Level 2 <input type="checkbox"/>	
	Registered nurse: Level 3 <input type="checkbox"/>	
	Other? _____	

8. Do you work:

(16)

Full time ☐

Part time ☐

Casual ☐

9. What worksite are you currently employed at?

(17)

Osborne Park Hospital ☐

Community and Women's Health, Fremantle ☐

Woodside Maternity Hospital ☐

North Metropolitan Community Health ☐

KNOWLEDGE SCALE

From the following scenarios, please circle the correct response. Only one answer is correct.

10. Jane's baby is now three (3) weeks old. Her friend has told her that she must feed for ten minutes on each breast or baby will not get enough fat in the milk. What is the best way to describe the effect of maternal hormones on milk production and delivery?

(18)

- a) When baby goes to the breast, nerves stimulate the production of prolactin in the anterior pituitary. Prolactin stimulates the milk production at this time and ensures that milk is letdown to be available for your baby.
- b) When the baby goes to the breast, everything is controlled by your hormones. You don't have to worry, just make sure that you feed baby until he goes to sleep. The longer you feed, the more milk you will produce.
- c) When baby is sucking at the breast, prolactin and oxytocin are produced causing the rich hindmilk to be pushed down the ducts and out the nipple pores. After a few weeks this effect diminishes and milk production is controlled by the effectiveness of baby's suck.
- d) When baby is suckling it is important that you do not get stressed, because it will inhibit the production of oxytocin which forces milk down to the nipple. Remember, that everytime you go to sleep your prolactin level will rise and this will help in maintaining your supply.

11. Allison's baby is now six (6) weeks old. She tells you that she is so fed up with her leaking breasts that she will probably wean when baby is eight (8) weeks old. She was distressed to find that she had 'sprung a leak' whilst during lovemaking. How could you assist Allison with this problem?

(19)

- a) Advise her that leaking is quite normal in the early weeks, and put her in touch with another mother who has told you that it was wonderful to see so much milk being produced. Also remind her that it should be manageable at eight (8) weeks.
- b) Advise her that she discuss the leaking with her partner, as it is a small inconvenience if compared to knowing that she is now able to achieve orgasm. Daytime leakage can be controlled by correct use of breast pads and more frequent feeding.
- c) Advise her that leakage of milk is a normal physiological response to stimuli such as baby's cry or nipple stimulation, but if the letdown occurs at the end of a feed she should see her GP and request oxytocin levels to be done.
- d) Advise her of the normal physiological response to stimuli, and ascertain when the leakage occurs, suggest strategies which will make her lactation more socially acceptable. A letdown can be initiated as a feature of foreplay, or the baby fed prior to making love.

12. John is ringing you about his wife who is breastfeeding their three (3) month old son. During the last two or three weeks she has noticed that she has had some hair falling out, her gums have been bleeding easily and she is getting more constipated than usual. He thinks that the baby should be weaned to formula so that his wife can get her health back. How can you help this family? (20)

- a) Suggest that she visit the dentist regularly, eat high fibre foods and take a zinc supplement. Reinforce the fact that the baby has a physiological need for mother's milk until four (4) months of age and breastfeeding is a good way of mother getting some rest.
- b) Suggest that she be referred to the dietitian for a nutrition assessment. Foods high in vitamin A and ascorbic acid supplements will help the gums to heal quickly. Walking each day around the block will assist with constipation if she drinks at least eight (8) glasses of water.
- c) Suggest that they should visit you to discuss the symptoms and to obtain her diet history and food preferences. Ask him who does the shopping and cooking, and if he feels she is eating well. Does he think her diet affects lactation. Check his employment status to ascertain if the cost of formula feeding is a budget factor to be considered.
- d) Suggest that they visit their family practice physician for a full blood screening. Ask if there are allergies on either side of the family, and check for familial food intolerance. All medications given for constipation during lactation should be checked by a medical practitioner.

13. The baby is six (6) months old. The mother has been diagnosed again with a herpes simplex infection on the left nipple. Her GP has told her to stop feeding and given her appropriate medication. She is distressed that she has to stop early. You should first: (21)

- a) ascertain the number of lesions and advise her she can keep feeding from the unaffected side because her antibodies will help protect the infant.
 - b) ascertain from the GP how many days she should express and discard her milk.
 - c) advise the mother she should continue the medication but not kiss the infant whilst the lesion is open.
 - d) advise the mother to wear a mask, and to take care not to contaminate the infant with bedding or clothing which has been exposed to the vulva.
- 14.** Marie was a gym instructor before having her baby. She talks to you after your workout about the difficulties she had with sore nipples last time. She laughs about being told by a NMAA counsellor that she probably had 'jogger's nipple'. What explanation could you give to assist with the next lactation? (22)
- a) explain that it is most unlikely that exercise would cause nipple damage whilst she was wearing a good supportive sports bra.
 - b) explain that damage can occur with women who have delicate skin and who wear nylon clothing whilst doing vigorous exercise.
 - c) explain that the function of the Montgomery's glands is to produce a lubricant which ensures the skin is soft and supple.
 - d) explain that baby should be fed before any exercise and breast pads applied so that the breast is not engorged and pressing against the fabric of the bra.
- 15.** Many women are told by GPs to stop breastfeeding whilst on medication. You will be able to assist the mother to make an informed decision about her treatment and her mothering goals when the following principles are applied: (23)
- a) first do not harm is considered for mother and baby, formula is given when the risks in breastfeeding are too high, and the maternal medication is only given for five (5) days.
 - b) ensuring a multidisciplinary approach by checking with her GP if this drug is really necessary, or the pharmacist, for contra-indications for use, and then suggesting alternatives.
 - c) ensure that you are personally up to date on the effects of drugs in lactation, and advise the mother accordingly.
 - d) ensure professional integrity, maintain a high level of education in lactation and liaise appropriately with health professionals who support and promote breastfeeding.
- 16.** An Australian survey found that whilst 80% of adolescents intended to breastfeed, only 15.5% expected to use breastmilk alone. This study confirms that: (24)
- a) teenage mother should be taught about bottle feeding and sterilisation whilst in hospital.
 - b) breastfeeding is unacceptable to the majority of teenagers.
 - c) mixed feeding is socially acceptable in this subculture.
 - d) bottle feeding principles should be included in secondary school courses.

17. Rowan's mother is a retired midwife. She is concerned about her granddaughter's slow weight gain, at ten (10) days and wants to do the best for her son and his wife. She rings to find out where she can get some lightweight scales so that they can test weigh the baby each feed for the next five days. What can you advise about the monitoring of the baby's weight? (25)
- a) Test weighing is an accurate method of measuring weight gain whilst baby is in hospital, but clinical observations are now a better guide.
 - b) Daily weighing for five (5) days is a good way to reassure the mother that baby is drinking enough for his needs.
 - c) Computerised assessment of breast volume is the most accurate way of measuring baby's weight potential.
 - d) The mother will feed better if stressors are removed from the environment and she is taught to make clinical observations which reflect the infants state of wellbeing.
18. During her antenatal consultation a mother asks if she can have it recorded on her notes that she does not want her baby to be given any formula feeds during the hospital stay. When baby is born, it is sleepy and does not suck for the first five (5) hours. The blood sugar is low and the medical officer orders a tube feed to be given. The mother is sleeping. What are your legal or ethical responsibilities? (26)
- a) to inform the mother and father of the medical condition.
 - b) to advise the medical officer of the parents wishes, obtain informed consent for formula before doing the feed.
 - c) to assist the mother with expression of colostrum and top up the feed with dextrose 10%.
 - d) to explain how frequent expressing will enhance milk production and clarify with the medical officer the degree of urgency for giving formula via an IGT.
19. The technology used during lactation should be appropriate to the needs of mother and child. Many mothers think that they must buy the latest electric breast pump to maintain a supply whilst working outside the home. What factors should be considered when suggesting lactation aids? (27)
- a) parent level of education, physical disability, availability of replacement parts.
 - b) suitability to the identified problem, parent preference, availability of equipment.
 - c) hospital policy, potential risks of material used (eg silicone), acceptability for use in public.
 - d) recent research findings, initial cost, ease of cleaning.
20. Mary is in her first trimester. She has been told by her obstetrician to wean her twelve (12) months old infant from the breast so that her calcium stores will not be depleted. Mary feels she is not yet ready to change the relationship she has with the infant - the night feed is particularly important to her. What do you think Mary should do? (28)

- a) Commence a gradual weaning process, to be completed in six (6) weeks.
- b) Continue feeding, and discuss her diet with a dietitian - including the developmental needs of the foetus.
- c) Employ a lactation consultant who will advocate on her behalf to the obstetrician.
- d) Ask the obstetrician at the next visit for scientific evidence which will support his view that breastfeeding will deplete maternal calcium stores during pregnancy.

21. Many fathers are concerned about how much breastmilk their infant's receive during a feed in the first week. Many believe that it is better to bottle feed because 'you can see how much they are getting'. Which of the following should **not** be part of your advice for the new parents as they try to assess the adequacy of feeds?

(29)

- a) When bowel actions are soft and frequent it indicates that baby is drinking more than he actually needs.
- b) Baby is sleeping a good five (5) to six (6) hours after each feed, so he is obviously getting more than he biologically requires.
- c) When you look at baby, how does his skin and muscle tone seem to you? A well fed baby 'just' looks good.
- d) What comes out must have gone in! When there are plenty of wet nappies at least six (6) to eight (8) in a twenty four (24) period, you can judge that baby has had plenty to drink at the breast.

22. Preterm breastmilk differs from mature milk because it has more of the following **except**:

(30-33)

- a) lactose
- b) sodium
- c) protein
- d) iron

23. The breastfeeding mother with diabetes may find that she:

- a) is more prone to thrush
- b) may have an infant with hyerglycaemia
- c) has an increased need for insulin
- d) is less prone to mastitis

24. Pasteurisation reduces/destroys all of the following **except**:

- a) IgA
- b) lactoferrin
- c) lymphocytes
- d) bifidus growth factor

25. The best time for a lactating mother to take a short-acting medication is:

- a) immediately before a breastfeed
- b) just after the infant's longest sleep period
- c) immediately after a breastfeed
- d) half an hour before a breastfeed

CLINICAL CONFIDENCE

On a scale of 1-5, with 5 being the highest score, rate your confidence in the following areas: 1) not confident at all, 2) not confident, 3) neutral, 4) confident 5) very confident.

	NCA	NC	N	C	VC	
26.						(34-40)
provide antenatal B/F preparation of clients	1	2	3	4	5	
help mothers with breastfeeding	1	2	3	4	5	
assist with establishment of lactation	1	2	3	4	5	
support parents in maintenance of breastfeeding	1	2	3	4	5	
conduct lactation group sessions	1	2	3	4	5	
conduct lactation education on an individual basis	1	2	3	4	5	
management of breastfeeding problems	1	2	3	4	5	

27. On a scale of 1-5, with 5 being the highest score, rate how frequently you would use the following resources to assist you in problem solving if you were unable to help a client successfully breastfeed? 1) never, 2) rarely, 3) sometimes, 4) often, 5) always

	N	R	S	O	A	
						(41-46)
lactation consultant	1	2	3	4	5	
researching the literature	1	2	3	4	5	
general medical practitioner	1	2	3	4	5	
consult a textbook	1	2	3	4	5	
nursing colleagues	1	2	3	4	5	
breastfeeding support group eg. NMAA	1	2	3	4	5	

28. How frequently in your midwifery or nursing practice do you need to attach the baby to the breast for the mother? (47)

N	R	S	O	A
1	2	3	4	5

29. What do you consider the three most important midwifery or nursing practices, in assisting the establishment of breastfeeding? (48-58)

1. _____
2. _____
3. _____

30. What do you consider are the three most important factors in successful breastfeeding? (59-69)

1. _____
2. _____
3. _____

ATTITUDE SCALE

On a scale of 1-5, rate your attitude to the following, by circling the number which corresponds to your answer: 1) totally disagree, 2) disagree, 3) neutral, 4) agree, 5) totally agree

	TD	D	N	A	TA
All adoptive babies should be breastfed for 3 months	1	2	3	4	5
Overhandling of infants causes gastric reflux	1	2	3	4	5
Picking up a baby too often causes spoiling	1	2	3	4	5
An evening complimentary feed helps the infant to sleep through the night	1	2	3	4	5
Breastmilk and modern formulas are almost the same	1	2	3	4	5
Promoting breastfeeding to clients often sets them up for guilt feelings/failure when not achieved	1	2	3	4	5
Partners should allow lactating mothers to make their own decisions on weaning	1	2	3	4	5
Breastfeeding can be too restrictive on modern lifestyles	1	2	3	4	5
Breastfeeding too often develops dependence/separation anxiety for the infant	1	2	3	4	5
Long term breastfeeding causes paternal relationships to be inhibited	1	2	3	4	5
Health professionals need to assist attachment of the infant to the breast in the first two days	1	2	3	4	5
Proficient health professional assistance is the most important factor in the establishment of successful breastfeeding	1	2	3	4	5
Babies should be breastfed every 2-3 hours in the beginning	1	2	3	4	5
Nipple shields are the best approach for sore nipples	1	2	3	4	5
Demand feeding helps to prevent primary engorgement	1	2	3	4	5

(70-84)

Thankyou for your participation

POST-TEST QUESTIONNAIRE OF THE LACTATION ADVISER PROGRAM

DEMOGRAPHIC DATA

Please answer the following questions by filling in the space provided or by ticking the box.

CODE ☐ ☐ ☐

Office use
(1-3)

1. What worksite are you currently employed at?

(4)

- | | |
|---|----------------------------|
| Osborne Park Hospital | <input type="checkbox"/> 1 |
| Community and Women's Health, Fremantle | <input type="checkbox"/> 2 |
| Woodside Maternity Hospital | <input type="checkbox"/> 3 |
| North Metropolitan Community Health | <input type="checkbox"/> 4 |
| Swan District Health Service | <input type="checkbox"/> 5 |
| Swan Districts Hospital | <input type="checkbox"/> 6 |

KNOWLEDGE SCALE

From the following scenarios, please circle the most appropriate response.
Only one answer is correct.

2. Jane's baby is now three (3) weeks old. Her friend has told her that she must feed for ten minutes on each breast or baby will not get enough fat in the milk. What is the best way to describe the effect of maternal hormones on milk production and delivery?
- a) When baby goes to the breast, nerves stimulate the production of prolactin in the anterior pituitary. Prolactin stimulates the milk production at this time and ensures that milk is letdown to be available for your baby.
- b) When the baby goes to the breast, everything is controlled by your hormones. You don't have to worry, just make sure that you feed baby until he goes to sleep. The longer you feed, the more milk you will produce.
- c) When baby is sucking at the breast, prolactin and oxytocin are produced causing the rich hindmilk to be pushed down the ducts and out the nipple pores. After a few weeks this effect diminishes and milk production is controlled by the effectiveness of baby's suck.
- d) When baby is suckling it is important that you do not get stressed, because it will inhibit the production of oxytocin which forces milk down to the nipple. Remember, that everytime you go to sleep your prolactin level will rise and this will help in maintaining your supply.

(5)

3. Allison's baby is now six (6) weeks old. She tells you that she is so fed up with her leaking breasts that she will probably wean when baby is eight (8) weeks old. She was distressed to find that she had 'sprung a leak' during lovemaking. How could you assist Allison with this problem? (6)
- a) Advise her that leaking is quite normal in the early weeks, and put her in touch with another mother who has told you that it was wonderful to see so much milk being produced. Also remind her that it should be manageable at eight (8) weeks.
 - b) Advise her that she discuss the leaking with her partner, as it is a small inconvenience compared to knowing that she is now able to achieve orgasm. Daytime leakage can be controlled by correct use of breast pads and more frequent feeding.
 - c) Advise her that leakage of milk is a normal physiological response to stimuli such as baby's cry or nipple stimulation, but if the letdown occurs at the end of a feed she should see her GP and request oxytocin levels to be done.
 - d) Advise her of the normal physiological response to stimuli, and ascertain when the leakage occurs, suggest strategies which will make her lactation more socially acceptable. A letdown can be initiated as a feature of foreplay, or the baby fed prior to making love.
4. John is ringing you about his wife who is breastfeeding their three (3) month old son. During the last two or three weeks she has noticed some hair falling out, her gums have been bleeding easily and she is getting more constipated than usual. He thinks that the baby should be weaned to formula so that his wife can get her health back. How can you help this family? (7)
- a) Suggest that she visit the dentist regularly, eat high fibre foods and take a zinc supplement. Reinforce the fact that the baby has a physiological need for mothers milk until four (4) months of age and breastfeeding is a good way of mother getting some rest.
 - b) Suggest that she be referred to the dietitian for a nutrition assessment. Foods high in vitamin A and ascorbic acid supplements will help the gums to heal quickly. Walking each day around the block will assist with constipation if she drinks at least eight (8) glasses of water.
 - c) Suggest that they should visit you to discuss the symptoms and to obtain her diet history and food preferences. Ask him who does the shopping and cooking, and if he feels she is eating well. Does he think her diet affects lactation. Check his employment status to ascertain if the cost of formula feeding is a budget factor to be considered.
 - d) Suggest that they visit their family practice physician for a full blood screening. Ask if there are allergies on either side of the family, and check for familial food intolerance. All medications given for constipation during lactation should be checked by a medical practitioner.

5. The baby is six (6) months old. The mother has been diagnosed again with a herpes simplex infection on the left nipple. Her GP has told her to stop feeding and given her appropriate medication. She is distressed that she has to stop early. You should first: (8)
- a) ascertain the number of lesions and advise her she can keep feeding from the unaffected side because her antibodies will help protect the infant.
 - b) ascertain from the GP how many days she should express and discard her milk.
 - c) advise the mother she should continue the medication but not kiss the infant whilst the lesion is open.
 - d) advise the mother to wear a mask, and to take care not to contaminate the infant with bedding or clothing which has been exposed to the vulva.
6. Marie was a gym instructor before having her baby. She talks to you after your workout about the difficulties she had with sore nipples last time. She laughs about being told by a NMAA counsellor that she probably had 'jogger's nipple'. What explanation could you give to assist with the next lactation? (9)
- a) explain that it is most unlikely that exercise would cause nipple damage whilst she was wearing a good supportive sports bra.
 - b) explain that damage can occur with women who have delicate skin and who wear nylon clothing whilst doing vigorous exercise.
 - c) explain that the function of the Montgomery's glands is to produce a lubricant which ensures the skin is soft and supple.
 - d) explain that baby should be fed before any exercise and breast pads applied so that the breast is not engorged and pressing against the fabric of the bra.
7. Many women are told by GPs to stop breastfeeding whilst on medication. You will be able to assist the mother to make an informed decision about her treatment and her mothering goals when the following principles are applied: (10)
- a) first the degree of harm is considered for mother and baby, formula is given when the risks in breastfeeding are too high, and the maternal medication is only given for five (5) days.
 - b) ensuring a multidisciplinary approach by checking with her GP if this drug is really necessary, or the pharmacist, for contra-indications for use, and then suggesting alternatives.
 - c) ensure that you are personally up to date on the effects of drugs in lactation, and advise the mother accordingly.
 - d) ensure professional integrity, maintain a high level of education in lactation and liaise appropriately with health professionals who support and promote breastfeeding.

8. An Australian survey found that whilst 80% of adolescents intended to breastfeed, only 15.5% expected to use breastmilk alone. This study confirms that: (11)
- a) teenage mothers should be taught about bottle feeding and sterilisation whilst in hospital.
 - b) breastfeeding is unacceptable to the majority of teenagers.
 - c) mixed feeding is socially acceptable in this subculture.
 - d) bottle feeding principles should be included in secondary school courses.
9. Rowan's mother is a retired midwife. She is concerned about her granddaughter's slow weight gain at ten (10) days and wants to do the best for her son and his wife. She rings to find out where she can get some lightweight scales so that they can test weigh the baby each feed for the next five days. What can you advise about the monitoring of the baby's weight? (12)
- a) Test weighing is an accurate method of measuring weight gain whilst baby is in hospital, but clinical observations are now a better guide.
 - b) Daily weighing for five (5) days is a good way to reassure the mother that baby is drinking enough for his needs.
 - c) Computerised assessment of breast volume is the most accurate way of measuring baby's weight potential.
 - d) The mother will feed better if stressors are removed from the environment and she is taught to make clinical observations which reflect the infant's state of wellbeing.
10. During her antenatal consultation a mother asks if she can have it recorded on her notes that she does not want her baby to be given any formula feeds during the hospital stay. When baby is born, it is sleepy and does not suck for the first five (5) hours. The blood sugar is low and the medical officer orders a tube feed to be given. The mother is sleeping. What are your legal or ethical responsibilities? (13)
- a) to inform the mother and father of the medical condition.
 - b) to advise the medical officer of the parent's wishes, obtain informed consent for formula before doing the feed.
 - c) to assist the mother with expression of colostrum and top up the feed with dextrose 10%.
 - d) to explain how frequent expressing will enhance milk production and clarify with the medical officer the degree of urgency for giving formula via an IGT.
11. The technology used during lactation should be appropriate to the needs of mother and child. Many mothers think that they must buy the latest electric breast pump to maintain a supply whilst working outside the home. What factors should be considered when suggesting lactation aids? (14)
- a) parent level of education, physical disability, availability of replacement parts.
 - b) suitability to the identified problem, parent preference, availability of equipment.
 - c) hospital policy, potential risks of material used (eg silicone), acceptability for use in public.
 - d) recent research findings, initial cost, ease of cleaning.

17. The best time for a lactating mother to take a short-acting medication is:

(20)

- a) immediately before a breastfeed
- b) just after the infant's longest sleep period
- c) immediately after a breastfeed
- d) half an hour before a breastfeed

CLINICAL CONFIDENCE

On a scale of 1-5, with 5 being the highest score, rate your confidence in the following areas: 1) not confident at all, 2) not confident, 3) neutral, 4) confident 5) very confident.

(21-27)

	NCA	NC	N	C	VC
18. provide antenatal B/F preparation of clients	1	2	3	4	5
help mothers with breastfeeding	1	2	3	4	5
assist with establishment of lactation	1	2	3	4	5
support parents in maintenance of breastfeeding	1	2	3	4	5
conduct lactation group sessions	1	2	3	4	5
conduct lactation education on an individual basis	1	2	3	4	5
management of breastfeeding problems	1	2	3	4	5

On a scale of 1-5, with 5 being the highest score, rate how frequently you would use the following resources to assist you in problem solving if you were unable to help a client successfully breastfeed? 1) never, 2) rarely, 3) sometimes, 4) often, 5) always

(28-33)

	N	R	S	O	A
19. lactation consultant	1	2	3	4	5
researching the literature	1	2	3	4	5
general medical practitioner	1	2	3	4	5
consult a textbook	1	2	3	4	5
nursing colleagues	1	2	3	4	5
breastfeeding support group eg. NMAA	1	2	3	4	5

20. How frequently in your midwifery or nursing practice do you need to attach the baby to the breast for the mother?

(34)

N	R	S	O	A
1	2	3	4	5

21. What do you consider the three most important midwifery or nursing practices, in assisting the establishment of breastfeeding?

(35-45)

- 1. _____
- 2. _____
- 3. _____

22. What do you consider are the three most important factors in successful breastfeeding?

(46-56)

1. _____
2. _____
3. _____

ATTITUDE SCALE

On a scale of 1-5, rate your attitude to the following, by circling the number which corresponds to your answer: 1) totally disagree, 2) disagree, 3) neutral, 4) agree, 5) totally agree

(57-71)

	TD	D	N	A	TA
23. All adoptive babies should be breastfed for 3 months	1	2	3	4	5
Overhandling of infants causes gastric reflux	1	2	3	4	5
Picking up a baby too often causes spoiling	1	2	3	4	5
An evening complimentary feed helps the infant to sleep through the night	1	2	3	4	5
Breastmilk and modern formulas are almost the same	1	2	3	4	5
Promoting breastfeeding to clients often sets them up for guilt feelings/failure when not achieved	1	2	3	4	5
Partners should allow lactating mothers to make their own decisions on weaning	1	2	3	4	5
Breastfeeding can be too restrictive on modern lifestyles	1	2	3	4	5
Breastfeeding too often develops dependence/separation anxiety for the infant	1	2	3	4	5
Long term breastfeeding causes paternal relationships to be inhibited	1	2	3	4	5
Health professionals need to assist attachment of the infant to the breast in the first two days	1	2	3	4	5
Proficient health professional assistance is the most important factor in the establishment of successful breastfeeding	1	2	3	4	5

	TD	D	N	A	TA
Babies should be breastfed every 2-3 hours in the beginning	1	2	3	4	5
Nipple shields are the best approach for sore nipples	1	2	3	4	5
Demand feeding helps to prevent primary engorgement	1	2	3	4	5
Thankyou for your participation					