



12-2016

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Recommended Citation

Lakhani, A, Jan, R, Mubeen, K, Karimi, S, Shahid, S, Sewani, R, Baig, M, & Adnan, F. Strengthening the Knowledge and Skills of Community Midwives in Pakistan through Clinical Practice Internships. *Journal of Asian Midwives*. 2016;3(2):26–38.

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Abstract

Objective: On the-job training of Community Midwives (CMWs) is of critical importance in enabling midwives to provide services that meet standards of quality care. The objective of this study was to assess the intervention of an internship for CMWs that would increase their ability to provide quality maternal, newborn, and child health services.

Method: A pre and post-intervention design was used to evaluate the effectiveness of an internship of 32 working days. Validated questionnaire was used to assess the CMWs' knowledge and skills before and after the intervention. Overall, 252 CMWs from 14 districts of the Sindh and Punjab provinces of Pakistan participated in the study.

Result: The intervention improved both the knowledge and skills of the midwives. The pre and post skills and knowledge assessments demonstrated statistically significant increases in the mean scores ($p < 0.0001$).

Conclusion: Challenges were encountered in organizing and accessing internship sites and experienced mentors. However, the study found that the internship program helpful for the CMWs to enhance their knowledge and hands-on practice. We recommend that it be continued in future for this cadre of midwives.

Keywords: *In-service education, Community midwives' training, hands-on practice, midwife competency, clinical internship*

Background

Skilled Birth Attendants (SBAs) have been found to be instrumental in achieving the Sustainable Developmental Goals (SDGs) that aim to reduce maternal mortality by 70 per 100,000 live births and to bring neonatal mortality to as low as 12 per 1000 live births.¹ It is estimated that skilled birth attendance will need to increase to 90% or higher in order to achieve the United Nations (UN) post 2015 agenda.² This is a substantial challenge in Pakistan, given that only 52% of the births were attended by SBAs in 2012-13.³

Until 2007, three types of midwifery education programmes were available and recognized by the Pakistan Nursing Council (PNC). These included a two-year Lady Health Visitor (LHV), a 15-month Pupil Midwife, and a one-year Nurse Midwife programme. The pupil and nurse midwives were mainly prepared to work in facilities, and therefore, their services remained distant for marginalized women living in rural conditions. Only LHVs provide maternal and child health (MNCH) services in both hospital and community settings. Therefore, in an effort to rapidly increase skilled birth attendance, especially in the rural areas, the Government of Pakistan initiated an 18-month diploma programme in Community Midwifery,⁴ based on the competencies laid down by the International Confederation of Midwives (ICM).⁵ It was planned that after receiving training for antenatal care (ANC), home deliveries, postnatal care (PNC), newborn care, and referral for emergency cases, the Community Midwives (CMWs) would be deployed in rural communities, in coordination with the health centers of the Ministry of Health; to be supervised by the Lady Health Supervisors of the National Program for Family Planning and Primary Health Care.⁶

In total, the government planned to train and deploy 12,000 CMWs across Pakistan.⁴ While the infusion of this large number of SBAs has the potential for creating substantial improvement in maternal health services, assessment of the CMWs, through various local studies, has shown several deficiencies in the CMWs' knowledge and skills about various aspects of maternal and neonatal health,^{7,8} suggesting the need for improvement in the quality of their service delivery.⁹

A major limitation of the CMW training is inadequate hands-on practice and experience in clinical settings.⁸ Lack of competence of birth attendants can compromise the quality of care and cause harm to mothers and newborns.⁹ A global survey of 2,470 midwifery personnel, from 93 countries,¹⁰ showed a need for greater exposure to different settings. Especially needed were rotations of placements from community to hospital, to develop and maintain skills in both settings and to build connections. Also needed is supportive supervision, coaching, and mentoring, which has been shown to improve the quality of midwifery care.¹⁰ Therefore, on-the-job continuing education of qualified CMWs may be of critical importance in enabling CMWs to provide improved services.

An internship that provides an opportunity for CMWs to observe and assist in the provision of MNCH services alongside an experienced provider could increase their skills and confidence in their clinical practice. Experiences of nurses and midwives in other studies have shown that clinical internships enabled them to provide high quality services; however, this has not been tested for midwives in Pakistan.^{11, 12} Hence, we thought CMWs who would undertake an internship after already receiving their formal midwifery training, would improve their ability to provide high quality maternity services.

Research Question

Do trained CMWs who complete an internship with an experienced healthcare provider increase their knowledge and skills regarding the provision of maternal and child health services?

Methodology

Study Design

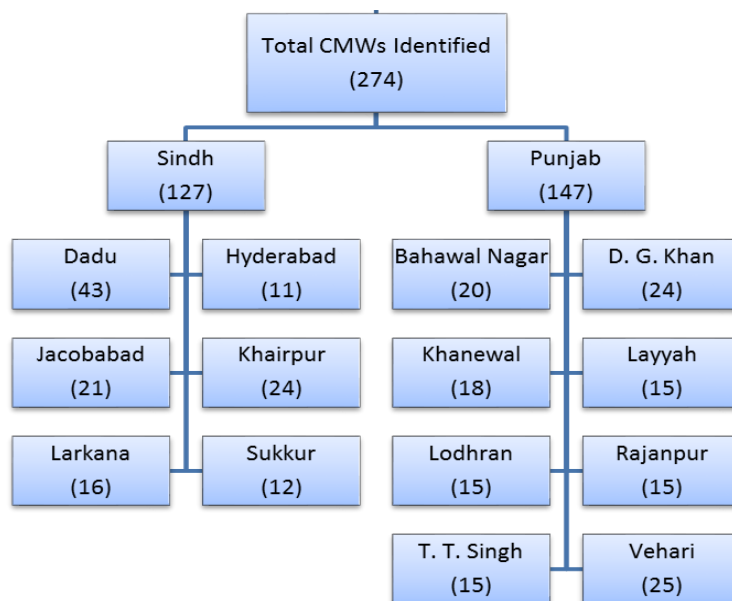
A pre-test post-test design was used to evaluate the effectiveness of the intervention, as measured by a validated instrument to assess knowledge and skills. The study had three phases: 1) pre-intervention test; 2) intervention; and 3) post- intervention test.

Study Sample

The intervention was designed for those CMWs who worked in the least developed rural communities and who had received minimum opportunities for continuing education after their midwifery graduation. Therefore, CMWs from 14 mostly rural and under-developed districts

from two provinces of Pakistan, Sindh and Punjab, were selected. The selection of districts also took account of having government or private facilities available for the internships. Purposive sampling was used to identify participants who fulfilled the eligibility criteria. The National Maternal Newborn and Child Health (NMNCH) programme provided a list of 550 CMWs who had graduated from a school of midwifery recognized by the Pakistan Nursing Council (PNC) from 2009-2012 and who lived in the selected districts. Of the 550, there were 274 eligible CMWs who agreed to participate. CMWs who were receiving other training at the time of the study were excluded to prevent contamination of the study's findings. Figure 1 shows the distribution of study participants from 14 districts.

Figure 1: Distribution of study participants from the selected districts



Data Collection Tool

A relevant data collection tool, previously used in developing countries, that included midwifery knowledge and skills assessments was selected for use in this study.¹³ Furthermore, this tool has also been used in Pakistan to measure the pre and post-assessment differences of refresher trainings of community midwives.¹⁴ The knowledge test comprised 21 Multiple Choice Questions (MCQs), within categories sequenced from antenatal care to postnatal and newborn care. To facilitate the understanding of the participants, the knowledge test was translated into Urdu. The translated test was forwarded to experts for content validity. Each MCQ was reviewed, and modifications were made in few terms

The ‘Skills Assessment’ used an observation checklist of 49 items, with a four point Likert scale, ranging from ‘done correctly’ (4), ‘partially correct’ (3), ‘incomplete’ (2) ‘not done’ (1), for each item. This checklist sampled midwifery care skills from antenatal care to immediate postnatal and newborn care. The observers were a group of midwifery experts who were familiar with the assessment process and the use of the checklist. The results of the tests were not known to the participants nor were they provided any feedback regarding their performance, to avoid influencing the post intervention results.

Intervention: Internship for CMWs

We recruited 76 private health facilities, with a minimum of eight antenatal visits per day and ten births per month, as sites for the CMW internships. Written agreements were signed with the facilities for the study period. The clinical internship provided a hands-on learning opportunity in a health care setting that enabled the CMWs to apply the theoretical concepts of midwifery to practice. Each CMW was allocated 32 working days at a health facility. During the internship, the CMWs assisted the private providers (who were mainly obstetricians or senior midwives) in the provision of perinatal care. The CMWs were required to keep a logbook of activities and reflective learning notes. The private care providers were responsible for supervising the performance of the CMWs’ and for signing their log sheets.

An LHV was hired in each district as an internship coordinator, to monitor the internships. Each internship coordinator was required to visit each facility twice a week and was responsible to the province’s project manager for the quality of the internship experience. The coordinators also ensured that the CMWs were caring for at least 25 pregnant women, observing at least three to four deliveries, and conducting at least one independent delivery during the internship.

Data Analysis

The pre and post-MCQ knowledge test was a paper and pencil test. The skills portion was tested in a structured clinical exam, using standardized scenarios. The Likert scale ratings were converted into continuous data for statistical analysis. The data from both the knowledge and skills components were entered into a computerized database. The data were double entered, compared, cleaned, and the errors were rectified. SPSS version 19.00 was used to conduct the

analysis. Descriptive and inferential analysis was performed to compare mean scores from pre and post-tests.

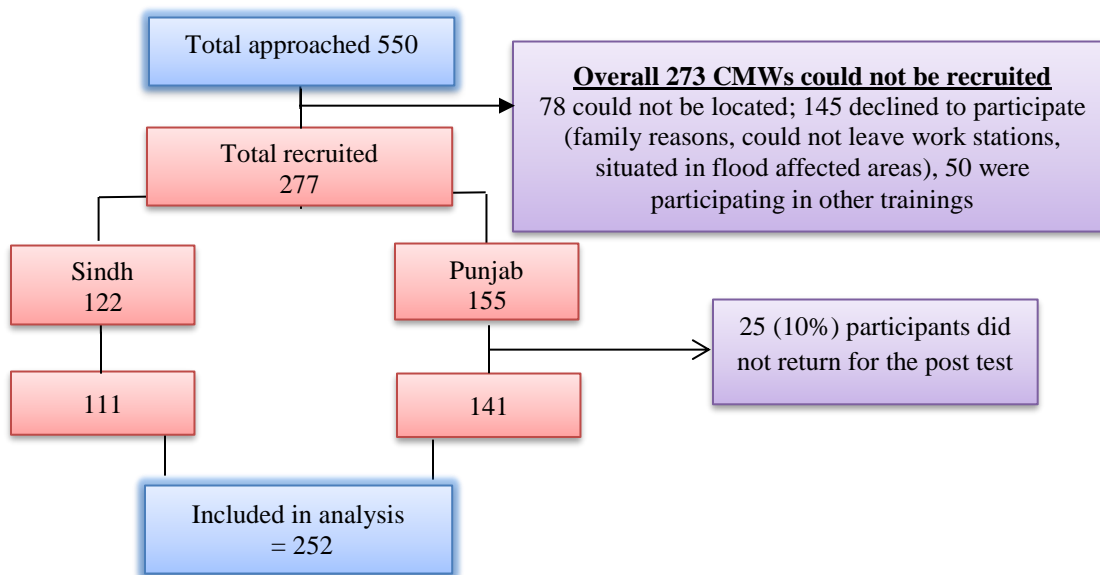
Ethical Considerations

Ethics approval was obtained from the National Bioethics Committee, Pakistan, and the Aga Khan University Ethics Review Committee. Informed consent was obtained from the CMWs, voluntary participation was ensured, and anonymity and confidentiality were maintained throughout the research project. After the selection of the sample, study participants were given unique identification numbers.

Results

We approached, all 550 CMWs from the selected districts but were able to recruit only 277. Figure 2 shows the process of recruitment of CMWs.

Figure 2: Recruitment process of CMWs



The reasons for non-participation are listed in Figure 2. The loss to follow-up was under 10%, resulting in a final sample of 252 CMWs available for analysis, 111 from Sindh and 141 from Punjab. The losses were concentrated in four districts out of 14, which suggest that local factors were a determinant of participation. The reasons for leaving the study included: (a) domestic issues, such as lack of family support; (b) work demands; (c) enrolment in higher education; and (d) personal health issues.

Demographic Information

Data obtained about the age and job status of CMWs (Table 1) showed that more than 70% of the CMWs were over the age of 25 years and more than 50% were working as CMWs.

Table 1: Demographic characteristics of the study participants

Demographics	Frequency (%) n=252
Age	
• <25 years	71 (28)
• 25-30 years	98 (39)
• > 30 years.	83 (33)
Work Status	
• Employed	131 (52)
• Unemployed	121 (48)

Knowledge Scores

The comparison of mean percentages of correct answers on each component of the pre and post knowledge test is shown in Table 2. In all the five components (antenatal care, infection prevention and control, intrapartum care, neonatal care, and immediate postnatal care), the midwives mean scores improved. The greatest improvement was in infection prevention, where the mean increased by 20 percentage points. Much smaller differences were seen in the other components.

Table 2: Percentages of Scores of the Knowledge Test (n=252)

Components	Pre-Test (%)	Post Test (%)
Antenatal Care	38.8	41.3
Infection Prevention	33.9	53.2
Intrapartum Care	42.1	49.8
Newborn Care	24.9	30.5
Immediate Postnatal	34.3	38.3

The Skills Test

Table 3 shows improvements in the skills components also. The greatest gains were in antenatal care and infection prevention, the lowest in intrapartum care.

Table 3: Percentages of Scores the Skills Test (n=252)

Components	Pre-Test (%)	Post Test (%)
Antenatal Care	64.9	82
Infection Prevention	74.2	88
Intrapartum Care	68.6	73.2
Newborn Care	72.8	77.2
Immediate Postnatal	73.3	82.7

We tested the significance of the mean differences between the overall scores of the pre and post knowledge tests and of the skills assessments, using the paired *t*-test (see Table 4). Both differences were statistically significant at $p < 0.0001$, demonstrating that the internship had improved the overall knowledge and skills of the CMWs.

Table 4: Inferential analysis of pre and post-intervention results (n=252)

Components of Tool	Mean Score of Pre-Test	Mean Score of Post-Test	Mean Difference	<i>p</i> Value
Knowledge	7.73 ±2.51	9.12 ±2.37	1.39±0.2	<0.0001
Skills	137.2±19.2	153.7±17.7	16.5±22.6	<0.0001

We were interested in knowing whether age or employment status was associated with differences in scores. We tested the association of employment versus being unemployed by applying the Pearson's correlation test and found $r = 0.101$ ($p = 0.109$), showing no significant difference in the mean scores. We also compared those under the age of 25 with those older than 25, and again found no significant difference in the mean scores ($r = 0.01$; $p = 0.863$).

Discussion

The research objective was to improve the knowledge and skills of CMWs through an internship with an experienced provider. Each CMW was able to assist at a minimum of three

deliveries, managed one delivery with minimal supervision, and provided services to over 25 antenatal clients at various gestational ages. The CMWs showed an increase in the mean scores in all the five components of midwifery care, on both knowledge and skills assessments. The areas of greatest gains were infection prevention and antenatal care, which may reflect greater exposure to antenatal care during the internship. Moreover, the mean increases in knowledge and skills were found to be highly statistically significant. However, when considering whether the increases were clinically important, there is reason to be cautious. Despite the statistically significant gain in scores, the post-intervention test results remain well under the benchmark knowledge scores of $\geq 65\%$ and skills scores $\geq 80\%$, established as “sufficient competence” by the author of the tool.¹⁴

The participants may not have achieved at the benchmark level because: (a) the study intervention did not provide theoretical content; (b) the internship was for six hours per day for 32 working days in settings with low volumes of clinical contact; (c) the 32 days were during the month of Ramadan (a Holy month for Muslims during which they follow the obligation of fasting) and the participants could not stay longer even if they wished to do so. Nevertheless, the findings indicate that the participants gained both knowledge and skills, in all the components of the assessments. Our findings provide support for creating internships as a valuable addition to the present training, as these can serve means of expanding quality maternity services to women and infants in rural and impoverished communities.

The lack of association of the participants’ age with the overall mean scores is of interest. Younger CMWs did not score significantly differently than those who were 25 years or older. However, a qualitative study exploring the perceptions of women regarding the midwifery-led care models in Pakistan revealed that women expressed satisfaction with the services of midwives who were more mature and were thought to be more capable of dealing with women during the different phases of the childbirth process.¹⁵ Because women and community members may view younger midwives less favourably than older midwives, it could be worth considering the age of midwifery graduates when designing future interventions for CMWs. Additional mentoring support for younger midwives may be necessary to help them and the community members feel confident about their knowledge and skills.¹⁶

The literature about internships shows benefits for staff retention and recruitment of physicians, nurse practitioners, and clinical nurse specialists. Success, though, is tied to the

degree of supportive infrastructure available within the health system.¹² During the planning stage of the study we encountered several challenges with infrastructure. We had difficulty finding and tracking the contact details of CMWs in the absence of a reliable management information system. Identifying private facilities for 277 participants, scheduling rotations, motivating CMWs' to leave their work stations for 32 working days, and overcoming the barrier of distance between CMWs placements and their home sites were all substantial challenges. Our experience shows the importance of addressing infrastructural deficiencies before planning a large intervention.

In addition to the above challenges, we found the lack of midwifery prepared mentors to support internships a major problem. The mentors who agreed to facilitate CMWs were mainly obstetricians, who are usually busy in their clinical practice. Moreover, although they are knowledgeable and skilled medical practitioners, they are not skilled mentors/educators.¹⁷⁻¹⁸ A study conducted in Australia found that when midwifery students worked with supportive midwives their learning was enhanced, even when the clinical environment was not supportive at the clinical placements.¹⁹

Our findings support the value of internships but our experience points to the necessity of having midwifery experts involved in planning, creating an enabling infrastructure, and developing experienced mentors, if such internships are to be of maximal benefit.

Strengths and limitations of the Study

The strengths of the study included the high rate of retention of study participants and the fact that placements were found for all the participants. Also, the sample size was large and findings were obtained by using a well validated tool to assess knowledge and skills. We could not prevent the possibility of additional learning occurring from sources other than the internship, but we did exclude anyone who was undertaking other formal training, opportunities, e.g. attending family planning workshops. One of the A limitations was the differences in the exposure to hands-on care and mentoring, due to so many different sites being used. Another was the lack of our ability to tailor learning to areas of individual deficit, since feedback about the pre-tests could not be shared with CMWs.

Conclusion

Our study findings showed highly statistically significant increases in the knowledge and skills of community midwives in the measured components of midwifery care. We conclude that practical internships for CMWs are beneficial for enhanced maternity services in communities. In 2003, a World Bank Report, based on the success of projects in China, Sri Lanka, and Malaysia, remarked that maternal mortality can be halved in developing countries every 7–10 years, regardless of variations in income levels and growth rates. An encouraging factor is that effective “field projects and innovations are being replicated by governments and their partner agencies.”²⁰

While this study showed an impact on these CMWs, the findings may not be generalizable to the entire population of CMWs. Importantly, the increases in knowledge and skills still fell below the recommended benchmark of competence. Continued study of interventions like internships is needed to learn how to maximally strengthen the knowledge and skills of CMWs in limited resource areas, so that more mothers and infants could benefit.

Acknowledgements

We would like to thank Green Star Social Marketing, Pakistan, who played an instrumental role in the implementation of the project. The team would also appreciate the active participation of the Community Midwives, who voluntarily participated in this study. Finally, we would like to thank Dr. Karyn Kaufman for her constructive feedback in the project report and the final manuscript.

Disclaimer

This document is an output from a study funded by the UK's Department for International Development (DFID) and the Australian Agency for International Development (AUSAID) and managed by the British Council through the Maternal and Newborn Health Research and Advocacy Fund for the benefit of developing countries. The views expressed are not necessary those of DFID/AUSAID.

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