

# DIGITAL PLATFORM FOR SKILLS TRANSFER IN THE MATERNAL HEALTH SECTOR IN INDIA - AN EFFICIENT COST-EFFECTIVE , AND FEASIBLE APPROACH

**Hema Divakar, Poorni Narayanan, Rita Singh, Raksha Suvarna , Dr Bhagyashree ,Divakar Gubbi**

Asian Research and Training Institute for Skill Transfer (ARTIST)

Centre of Excellence for Women's Health Care,

Divakars Speciality Hospital, 3<sup>rd</sup> floor, 220, 2<sup>nd</sup> phase JP Nagar, Bengaluru, 560078, India

Correspondence should be addressed to Hema Divakar

Email : [artistbengaluru@gmail.com](mailto:artistbengaluru@gmail.com)

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## Abstract

The health sector in India is facing a considerable skills gap that has negatively affected the quality of care provided. Nowhere is this more apparent than in the maternal health sector, where inconsistent quality of care has slowed down reductions in maternal and neonatal mortality. Although digital training has been leveraged in low and middle income countries to address health challenges, its viability in the Indian context had not been explored. The Asian Research and Training Institute for Skill Transfer (ARTIST), through its work on two programs tackling skills and knowledge gaps in the private maternal health sector, has found that digital training is a viable alternative to traditional on-site and in-class training approaches that could be rapidly scaled up to address the needs of the health industry in India at minimal cost.

**Keywords:** Digital learning, maternal health, India, skills gap, COVID-19, innovation

## Introduction

Although the maternal mortality rate in India has reduced considerably over the last twenty years, from 556 per 100 000 live births in 1990 to 130 per 100 000 live births in 2016 (1), with approximately 45,000 maternal deaths every year (2), India still has one of the highest maternal mortality rates in the world (3). This has been attributed in part to a skills gap at health care centers, including private health care centers, which serve more than 50% of the maternal population in India (4). The inconsistent quality of care resulting from this skills gap could be addressed by large-scale training of healthcare providers on standardized protocols and provision of up-to-date guidelines. Traditional in-class or on-site approaches are, however, ill-equipped to meet the scale of this demand, requiring large human and time resources.

Digital learning has been recognized as a viable alternative to traditional on-site learning programs (5). Besides being low-cost, effective, and easily scalable, its learning outcomes are similar to those of traditional in-class training (5); moreover, it has outperformed the status quo with regard to content retention (6). Owing to these attributes, it has been leveraged to address maternal health service challenges in low and middle income countries (LMICs). In Ethiopia, for example, an app containing evidence-based and up-to-date guidelines for dealing with complications during pregnancy and delivery, the Safe Delivery App, was successful in improving both the skills scores and knowledge scores of healthcare providers who used it (7), while in Indonesia, the Phillips mobile obstetrics monitoring (MOM) solution, which enabled monitoring of the health statuses of women in remote areas, showed potential to improve obstetric outcomes and reduce maternal mortality (8). Furthermore, in South Africa, the MomConnect Program developed by the Praekelt Organization in collaboration with government departments and other stakeholders improved the accessibility of two million women access to maternal health services through stage-based text messages, leading to its deployment in Nigeria and Uganda (9).

By leveraging low-cost innovation and the resources of stakeholders from the public and private sectors, LMICS can tackle challenges that are unique to their environments. Exponential changes driven by information technology, processing power, storage, and bandwidth are now impacting how organizations deliver care and train their workforces, particularly given the current global climate. However, the potential for digital platforms to address the skills gap in the private maternal health sector in India has not been explored. Through

its work on two digital training programs for health care providers serving pregnant and postpartum women, “Manyata” for ensuring safe delivery and the “Reset and Restart”—towards Preparedness for COVID-19 and beyond, the Asian Research and Training Institute for Skill Transfer (ARTIST), which was founded to accelerate discovery, development, and deployment of low cost innovations and technologies that can improve the maternal and neonatal mortality rates in India over the next 10 years, has found digital training to be a low cost, viable, effective, and easily scalable alternative to traditional training approaches in India. In the following sections, the two programs and their implementation will be briefly described, together with their impact on the knowledge and skills scores of the health workforce, which could potentially translate into better maternal outcomes.

### **Manyata**

Following the success of “Helping Mothers Survive,” a pilot program that increased the adherence of maternal health providers at 150 private hospitals to standard maternal health protocols, The Federation of Obstetric and Gynaecological Societies of India (FOGSI), with Jhpiego as a technical assistance partner and the MacArthur Foundation and MSD for Mothers as funders, launched Manyata, a nationwide program aiming to improve maternal and neonatal care in 500 private healthcare centers in India by ensuring that set maternal health quality standards (Appendix 1) are met (4). The program harnesses the power of professional societies not only to scale but also to self-regulate and ensure that evidence-based protocol-driven care is the minimal standard of care for safe delivery. Moreover, it equips providers with the tools they need to improve both their services and the care they offer patients, while helping patients better identify quality providers.

## **4. Review of Literature (Tables/graphs are restricted to 5)**

### ***The digital training program for Manyata***

The target audience for the digital training program were healthcare providers serving pregnant and postpartum women in Karnataka, Tamilnadu, and Rajasthan. The program developed and administered by team of experts at ARTIST, consisted of five 90-minute modules covering antenatal care, intranatal care, management of pregnancy complications; infection control and prevention and post-natal care. The program was supplemented by fortnightly refresher trainings (up to three months), where workshops on clinical checklists and system development procedures were digitally provided. Skills transfer workshops consisting of interactive role play and mock drills with simulators were also conducted so that the trainees could familiarize themselves with all aspects of labour and delivery. Each of the facilities enrolled their staff in the program by filling out a registration form, signing a letter of intent, and making a payment of Rs. 10,000 (~\$135). The head of the facility and staff nurse were then invited to a digitally delivered sensitization workshop that briefly described the contents of the course. The training program was delivered to the entire team of staff nurses (6 to 10 in number per set up) via digital platform by ARTIST over a course of six to seven weeks, with a 90-minute module delivered every ten days. A digital assessment on set deliverables was then conducted in the eighth week by the FOGSI lead assessor. Based on the score achieved, the facility was recommended for certification, which was provided by FOGSI. On passing the assessment, the hospital was awarded the Manyata certificate. Facilities receiving scores lower than 85% were re-assessed at a later time. A comparison of the impact of the digital training program and that of ongoing traditional training in Uttar Pradesh, Maharashtra, and Jharkhand was performed.

### ***Impact of the digital training program***

Since Manyata was launched in 2013, 600 private maternity centers across Uttar Pradesh, Maharashtra, and Jharkhand are either in the process of seeking Manyata certification or have received certification. Furthermore, over 2800 healthcare providers (serving 15,117,070 pregnant and postpartum women) have been trained using the traditional onsite training program. In comparison, over a span of six months, the staff of 95 centers in Tamilnadu, Karnataka, and Rajasthan were trained (20 centers every 8 weeks) and prepared for assessment. A further comparison of the traditional training program and the digital program prepared and implemented by ARTIST revealed that digital training is viable, effective, and easily scalable, requiring fewer time and financial resources than the traditional training program (Table 1).

There has been improved adherence to protocols overall. For example, Universal testing for gestational diabetes mellitus (GDM) as per Government of India recommendations is mandated for all pregnancies. Testing coverage has increased at all the centers, with a post-training value of 100% coverage in most centers, (Figure 1a). 90% of all anemic women are now treated on time, 100% of all women are given uterotonics within one minute of delivery to prevent PPH, Furthermore, early detection of neonatal sepsis and high-risk pregnancies, which was initially performed only sporadically, has now become the norm in all the

hospitals that enrolled in the training program (Figure 1b). Similarly, documentation of C-sections according to the Robsons criteria is now done in every case, yet previously, prior to the training, such records were not made. Armed with this data, obstetric units have begun performing audits and improving processes further for even better maternal and fetal outcomes. Consistent delivery of quality care as a result of improved adherence to protocols and therefore, no maternal deaths have been registered at the medical centers that took part in the digital training program. To further highlight the impact of the digital training program, the pre- and post-training scores for hospitals located in Karnataka that enrolled in the program are shown in Fig 2. These results complement the feedback ARTIST received from the healthcare providers enrolled in the digital training program: *“After completion of the training I have gained thorough practical knowledge of how to handle the various aspects of prenatal, intranatal, postnatal care”;* *“I know how to counsel and instruct the pregnant woman for glucose test for GDM”* *“my level of confidence in handling PPH cases has increase; I gained in-depth knowledge in handling a eclamptic patient in respective to their Medical Management”*; and *“I am able to resuscitate a newborn by myself confidently.”*

These findings highlight the value of skilling all the healthcare providers in a private facility as well as the efficacy of the program in imparting knowledge and developing skills. Moreover, they reveal that quality care is comprised of various facets, and technology-enabled/digital interventions can be used to enhance these key areas in order to improve the overall quality of care that mothers receive. Manyata programme that has been expanded to nine out of the 19 “aspirational districts” in Jharkhand, regions whose development indicators are lower than the average for India (10), is all set to reach out digitally to any / all regions .

**COVID-19 Preparedness Training**

Given the demands placed on health systems by COVID-19, ARTIST adapted the digital training tools for COVID-19 preparedness training. To determine whether digital learning via a digital platform could address emerging skills and knowledge gaps related to the prevention, control, containment, and management COVID-19 cases in Karnataka, ARTIST collaborated with the Rajiv Gandhi University of Health Sciences as well as the various OBGYN societies in Karnataka to run a digitally-administered training program for nurses, paramedical staff, and specialists providing maternal services at all the maternity homes and hospitals in Karnataka.

***Implementation of the digital training program for COVID-19 Preparedness***

A pilot program entitled “Reset and Restart—Preparedness for COVID-19 and Beyond” comprising a basic course for nurses and paramedical staff, and an advanced course for specialists was prepared and implemented by ARTIST. Each 90-minute course was delivered over digital platform to cluster of 35 centers with 100 participants through a combination of interactive presentations, PowerPoint Presentations, videos, and demonstrations ending with Q&A sessions. The following content was covered in each session:

1. A comprehensive curriculum on sensitizing and orienting the entire team in the hospital in infection prevention and control, clinical management, and safety advisories.
2. Dynamic documents offering up-to-date guidelines and recommendations
3. Guidelines for outpatient clinics, in patient services, use of personal protective equipment, hygiene and sanitation, disinfection protocol and biomedical waste management protocol, and the ideal format for triage were utilized.

***Impact of the digital training program***

Forty digitally delivered training sessions were successfully held from Monday to Saturday for three weeks for 3256 staff nurses, 1500 OBGYNS, and more than 1000 support staff from a total of 707 hospitals in Karnataka, highlighting the reach and time-saving attributes of the training program. The follow-up interviews, a post-training questionnaire, patient feedback on the quality of care, and a week-on-week reports submitted to Rajiv Gandhi University of Health Sciences revealed that the program was effective in standardizing protocols and practices across the various hospitals in Karnataka. Moreover, the average knowledge scores after training were significantly higher than those prior to training (Table 2), underscoring the program’s effectiveness.

The attributes, effectiveness, and impact of this program, adds to those of the Manyata digital training program, inspire confidence among the health fraternity that digital platforms can be used for skills transfer at scale in the health sector of India.

5. Conclusion

**Conclusion and Discussion**

The National Rural Health Mission (NRHM) explicitly stated in 2011 that “there is indeed a major crisis in human resources for health in India and that this crisis could account for much of the poor performance of the health sector” (11). A shortfall of healthcare providers has been identified India, where the availability of skilled health professionals is currently below the 22.8 per 10,000 people recommended by the WHO (12). In India, a shortage of nearly 2.6 million health workers has been estimated (13). Concomitant with this shortage is a skills and knowledge gap among the health workforce that is directly impacting the quality and consistency of healthcare (14). To address these challenges, health centers are providing several skills and training programs to meet the demands placed on them. However, to close the identified gaps, low-cost, effective and scalable innovative approaches will be needed either as adjuncts or stand-alone programs, given the insufficiency of traditional approaches.

The current global climate presents further challenges for such efforts. Health systems in LMICs have been overwhelmed by large volumes of patients, including pregnant women, presenting with COVID-19 symptoms. Furthermore, the lack of up-to-date guidelines, given the ever-changing global landscape, has left healthcare providers ill-equipped to contend with the demands placed on them. Restricted movement and lockdowns in various cities due to spikes in COVID-19 cases have limited the mobility of not only the health workforce but also patients seeking healthcare, and will continue to do so until a vaccine or therapy for COVID-19 is developed, yet access to up-date guidelines and recommendations is required to provide quality health care. Traditional on-site training programs, under such conditions, seem inappropriate, especially as social distancing requirements would limit the number of trainees per session, increasing costs and the time needed to reach a sufficient number of healthcare providers.

Based on its successful experience with skill transfer for the Manyata initiative, ARTIST was able to quickly fast track training for COVID-19 preparedness on a digital platform, which again proved effective for speedy skill transfer in the shortest possible time. This suggests that the utilized methodology in addition to the use of a digital platform could be leveraged routinely for skill transfer even after the COVID-19 pandemic has been brought under control to bridge the skills gap of the health workforce in India as quickly as possible. Moreover, the successful implementation of the digital training programs also highlights that digital learning is a viable alternative to on-site training in the local Indian environment, given its scalability, efficacy, and cost-effectiveness. The efficacy of any digital training program is dependent in part on the appropriateness of the program, i.e., its structure, content, and delivery, as well as its acceptability by its target audience (5). The impact of the programs highlights that the structure adopted by ARTIST is appropriate for the Indian environment and that the health workforce is open to using digital training programs. These findings could inform training programs in other health sectors now and in the future, allowing India to meet the UN Sustainable Development Goals.

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**Appendix 1**

**There are 16 clinical standards** on which a score of 85% needs to be obtained for the MANYATA certification. The clinical standards, which are simple, doable, and non-negotiable, are defined by the national professional organization the Federation of Obstetric and Gynaecological Societies of India (FOGSI).

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|---|
| <ul style="list-style-type: none"> <li>• <b>Standard one focuses on antenatal care.</b> It highlights universal testing for diabetes in pregnancy with a single-step non-fasting 75 gm two hour blood sample, as recommended by Government of India, FOGSI, and the International Federation of Obstetricians and Gynaecologists</li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>Standards two to five</b> relate to readiness in the labour room, history and examination of women who present for delivery, hand washing, and vaginal examination, and plotting of a partogram</li> </ul>  |
| <ul style="list-style-type: none"> <li>• <b>Standard six focuses</b> on maternal care, which should be given utmost importance across all resource settings. The presence of a birth companion is encouraged, and confidentiality and privacy is ensured</li> </ul>   |

<ul style="list-style-type: none"> <li>• <b>Standards seven eight and nine</b> address normal vaginal birth, new-born care and active management of the third stage of labour</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Standards ten to thirteen</b> focus on the management of pregnancy complications including postpartum haemorrhage and eclampsia care and resuscitation of new-borns</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Standards fourteen and fifteen</b> address waste management and post-partum care, including breast feeding initiation, immunization, and contraception.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Standard sixteen focuses on c sections.</b> It ensures that the healthcare providers are ready to perform a c-section and conduct Robson’s classification and audits</li> </ul>

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Table Captions

**Table 1.** Comparison of the attributes of the digital training and traditional on-site training programs.

**Table 2.** Average Pre- and post-training scores for hospitals in Karnataka for covid preparedness protocols

**Table 1.** Comparison of the attributes of the digital training and traditional on-site training programs.

Attributes	Only on-site training	Digital training
Duration of training	> 6 to 8 months	2 to 3 months
Certification	>8 to 10 months	Less than 3 months
Facilities	1–2 facilities	Cluster of 10–20 facilities
Economical	High	Cost effective
Flexibility	No	Yes
Accessibility	Low	High
Human resources	More staff required to reach different parts of India.	Minimal staff required & can connect throughout India.
Facilities receiving certification in 3 months	0	15 to 20
Average facility scores	65 to 85 %	85 to 100 %

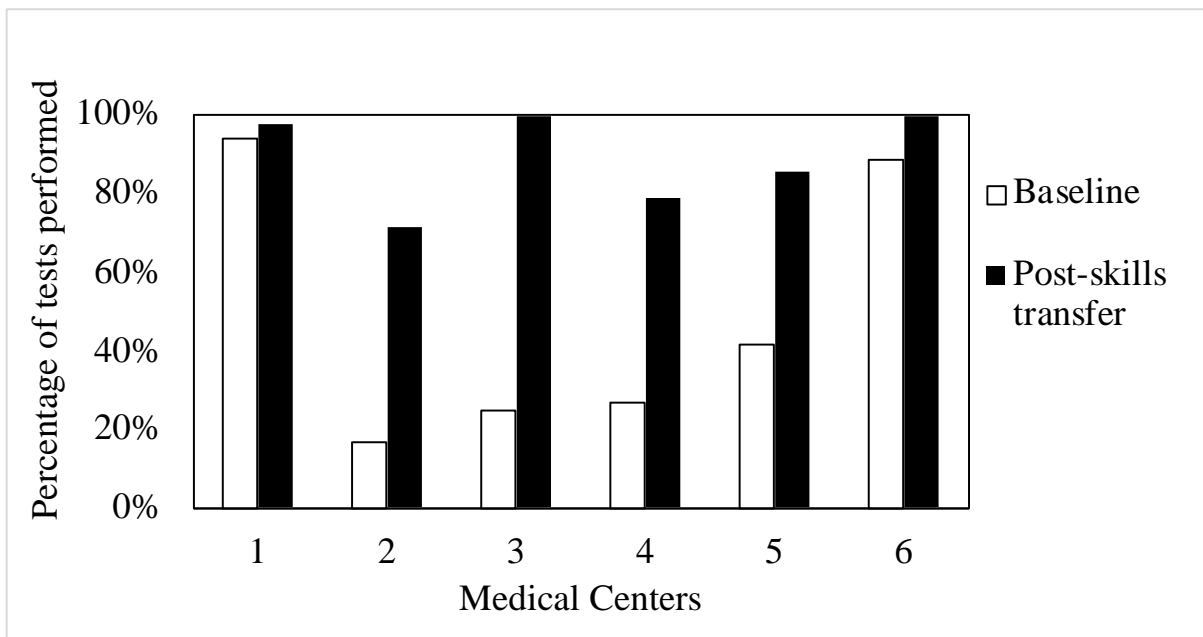
**Table 2. Table 2.** Average Pre- and post-training scores for hospitals in Karnataka for covid preparedness protocols

Protocols and Practices	Pre-training Scores (Baseline)	Post-training Scores
Masking	30%	76%
Social Distancing	41%	91%
Hand Washing Methods	52%	100%
Housekeeping Protocols	22%	65%
Operation Theatre Protocols	26%	88%
Delivery Room Protocols	34%	92%
Breast Feeding Practices	31%	100%

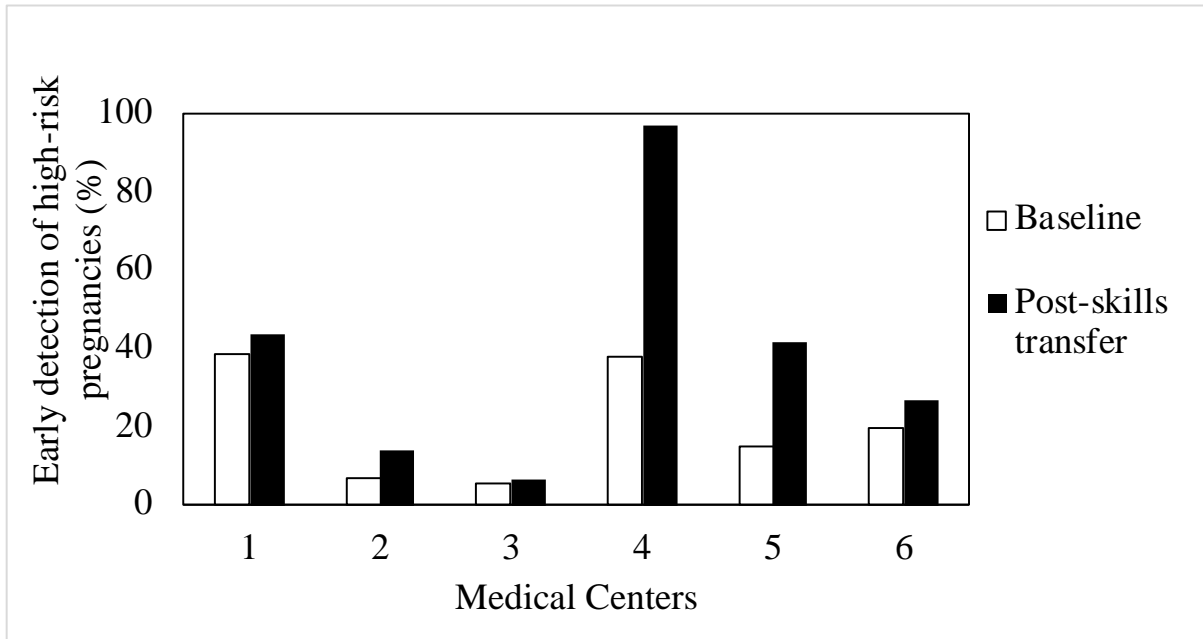
**Figure Captions**

**Figure 1.** Impact of the digital training program on six hospitals in Karnataka:

- (a) Percentages of glucose tolerance tests performed at the medical centres;
- (b) Percentages of high-risk pregnancies that were detected early.



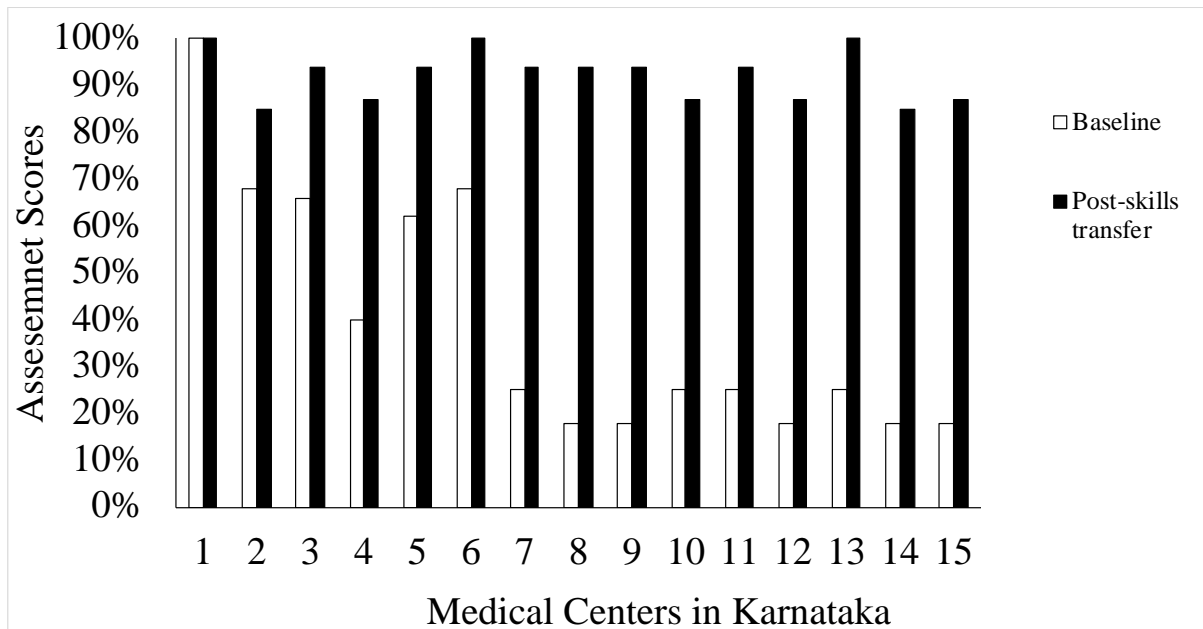
(a)



(b)

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**Figure 2.** Adherence to the 16 Manyata clinical standards: baseline scores vs post- skills transfer on a digital platform. A score of at least 85% was needed to receive certification. All the facilities met this requirement.



**Figure 2.**Adherence to the 16 Manyata clinical standards:baseline scores Vs post- skills transfer on a digital platform. A score of at least 85% was needed to receive certification. All the facilities met this requirement.