



Incorporation of lean methodology into the delivery of clinical training of advance nurse practitioners in urgent care

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Abstract

This pilot study was designed to investigate the ability of incorporating lean methodology into the delivery of medical education. The project worked within the academic remits of the University College Dublin (UCD), Master's in Advanced Practice (Nursing) program, which provided the academic rigor for the project. Practical and procedural skills were taught based on an adapted version of the RNZCUC's core skills list (CSL)

Using a combination of Kaizen Burst (rapid improvements) in teaching skill sessions and Kanban Pull (the voice of the consumer), the project incorporated both lean methods into the delivery of teaching skills and knowledge. These techniques allow for better understanding, easy retention, and accelerated learning. This allows for a better learning experience to those completing the training program feeling confident in utilizing the skills learnt to treat patients presenting to urgent care clinics appropriately

The project has shown a potential method for training of Advanced Nurse Practitioners (ANPs) to an accredited standard in urgent care with the use of lean methods in the delivery of skills and knowledge training. The ability for institutions to upskill and train the workforce would provide added benefits for workforce recruitment, development, and retention.

Keywords: Urgent Care; Nursing Training; Lean Methodology; Clinical Skills

1. Introduction

The delivery of skills and medical education has been subject to evolution over the past 150 years since the formalizing of its delivery and the formation of institutes of higher learning and subsequently the formation of Royal Colleges throughout the UK and worldwide. What was previously understood as delivery of knowledge in lecture halls and by demonstration of skills by a lecturer has now been changed over the last 20 years. The previous adage of 'see one, do one, teach one' has been replaced by the newer adage of 'see one, practice many, do many, teach one.' This concept has been explored in detail by Kohn et. al. in their seminal 'to err is human publication (1). The need for delivery of skill and knowledge on a continual basis, harmonizes well with the continuous improvement concepts that are the key in lean systems. Initially used as improvement mechanisms for manufacturing, lean thinking has recently been used in other approaches within curriculum development and delivery of education within certain courses in a collaborative fashion (2).

The use of lean in the delivery of teaching, skills and procedural training is a new concept that has not been used widely within the medical education sector. The sector has in recent years adopted a continuous improvement model, where training of certain areas, such as resuscitation in now done in safe areas with simulation (3). This is part of adaptation of learning techniques from the aviation and military sector. The attempt for this project is to break-down learning into

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smaller segments, done in a sequential fashion to allow for better depth of learning, reflective time and retention of the skills and knowledge taught. Incorporating continuous improvement and lean methodology of 'Kaizen Burst' sessions where skills and knowledge is taught allows for this to occur. The gaps of knowledge and skills can be identified by trainees, and from observations done by the supervisors and other staff within the clinical area. All this is done within a safe learning environment, with questions welcomed and seeking help encouraged. The adaptation of lean principles of continuous improvements with kaizen bursts, the pull of the trainee's requirement via Kanban, the elimination of waste of time spent by trainees looking for relevant learning material and an overall view of the whole training program via values stream mapping would help in the learning process (4).

The Royal New Zealand College of Urgent Care (RNZCUC) is the governing body involved in regulating urgent care (UC) clinics and training UC physicians in New Zealand (5). UC in New Zealand is a sector of healthcare provision that sits in between general practice (GP) and the hospital sector, particularly the emergency department (ED). The nursing workforce that works within the UC clinic have a varied work background; most would have some ED experience. In UC clinics, they presently perform duties that include, triaging, administration of medications, plastering and wound dressings. These duties are gained and perfected over a period of years of work in the ED and occasionally UC clinics. Advance Nurse Practitioners (ANP) are highly skilled practitioners and clinical leaders delivering quality care to an agreed group of patients. ANPs also serve as change agents who coordinate and evaluate health care and formulate policy which advances nursing practice and improves patient outcomes (6). ANPs can provide quality care for minor injuries and illness within the UC system.

Aims of the project

This project has the objective of investigating the possibility of providing similar training and teaching techniques for the qualification of ANPs within the UC system. The project worked within the academic remit of the University College Dublin (UCD), Master's in Advanced Practice (Nursing) program, which provided the academic rigor for the project. Practical and procedural skills were taught based on an adapted version of the RNZCUC's core skills list (CSL). The CSL provides a good base framework for competencies in clinical examination, history taking and procedural skills pertinent to UC work (7).

Inputs for the project included:

- Initial sessions with the trainees to identify present skills and knowledge along with opportunities for learning
- The frequent 'Kaizen Sessions' to teach the skills
- Continual feedback from both the trainees regarding their learning experience and from the trainers regarding any gaps that are identified

Outputs for the project would be the successful completion of the training program and the ability to register with the Nursing Council to work as an ANP. To our knowledge, this was the first attempt at training an ANP in the UC sector within the RNZCUC clinical standards in Ireland.

2. Implementation of Lean into Delivery of Teaching

In the ANP training project, a candidate that was suitable was identified as part of the project. The aim was to ensure that the eligible candidate was motivated to complete the training process as it would require time and effort in terms of study, skills acquisition and gaining of appropriate knowledge to fulfil the ANP function. Once the suitable candidate was identified, the initial step was to establish a working relationship with the individual and determine the amount of UC related clinical experience and knowledge that she possessed. This was part of the initial 'Gemba walk' to identify the areas for improvement that needed to be made and areas for consolidation of knowledge as well.

The candidate ANP (cANP) was then given an overall scheme for topics that would be covered over the dedicated period to ensure the totality of the curriculum required was covered. This was a form of 'value stream mapping' for the cANP to allow for a visual overview of the training, allowing both the cANP and the trainer to ensure that the timeframes available were adequate to meet the targets required for completion of the training.

Ensuring that the learning was done in a continuous manner and that the knowledge was retained by the cANP, regular sessions for feedback was arranged. In these sessions, questions regarding learning material were covered, any learning opportunities were investigated and where required, remedial work done to ensure that the skills learnt were retained and appropriate for use in the UC clinic. Additional clinical time was sought, from the clinic management, and allocated

to ensure that the whole learning process was seamless, and corrections to clinical and examination skills could be remedied in real time in clinical settings. This resulted in better understanding of clinical conditions, improved clinical examination skills, accurate radiological interpretation skills acquired, and high-quality treatments being provided to patient during the cANP's training phase. There was a safe learning environment that was created, with elements of psychological safety emphasized to allow for any mistakes done during the learning process to be taken as learning opportunities. This was done by creating shared expectations between the cANP and the trainer and reframing power dynamics within the learning process.

Adopting the lean methodology, regular 'Kaizen burst' sessions were arranged. Within these sessions, new material was covered, and skills taught. Skills involving clinical examinations were initially demonstrated and repeatedly covered. In the initial training phase, volunteer patients were used to teach each skill. These sessions covered the breath of the core skills list that was compiled, a truncated version of the core skills list that the RNZCUC trainees would be expected to learn and demonstrated competence in. Once the cANP was comfortable and confident in each skill that was being taught, selected and suitable patients with presenting to the clinic complaints that mirrored the learning process were chosen to be seen. A trainer supervised these initial consultations to ensure the skills were being performed correctly and accurately. Clinical decisions were also taught and assessed during these consultations. Appropriate management plans were discussed between the cANP, and the trainer present to ensure adequacy and quality of treatment being provided to patients. Mistakes that were made were identified and corrected in real time, within the safe learning environment discussed above. 'Kanban pull' sessions were subsequently held for informal feedback to be given by both the trainer to the cANP and the cANP to the trainer, regarding the teaching methods that were being used. Other trainers were identified to provide supplemental clinical supervision to the cANP whilst she was working in the UC clinics. These trainers were taken through the remit of the project, the relevant Kanban and Kaizen lean tools that would be used in the training process. The additional trainers were recruited to provide external and objective view regarding the cANP's training and additional ideas to help with the development of skills by the cANP. This was to ensure that the training provided had a varied and balance approach and would for future projects and wider roll-out ensure that a collaborative team approach could be pursued.

Effective change management within the project revolved around the acceptance of ANPs working within the UC clinic environment. This required buy-in from key stakeholders to the project, which included the clinic manager, medical and nursing staff within the clinic and the patients that were being treated in the clinic. The initial phase to obtain engagement was done by providing context for the need for ANPs within the UC clinic. Discussions regarding the ANP role and scope were held with all the stakeholders mentioned, this was done primarily by the ANP project lead. Any queries or concerns that were raised by the stakeholders were answered, and where necessary further discussions were held with the individuals separately. This meant that by the time of the cANP starting clinical work under supervision by the trainers in the clinical areas, most of the clinical team were aware of their presence and understood the role that the cANP would play.

Issues that arose during the pilot project, included the global COVID-19 pandemic that affected the way the cANP could learn. COVID-19 was a true constraint for the project as, the initial the numerous lockdowns and restriction to society meant that it curtailed the volume of patients attending the clinic. This meant that the cANP had limited exposure to variety of patients and presenting complaints. This constraint meant that there was need to request an extension for training to ensure that the cANP's clinical exposure was adequate. The limitation also resulted in a slight shift in focus for the cANP's training to accommodate the constraints. Therefore, rather than focus on both minor illness and injuries, the focus of training was centered primarily on minor injury presentations of patients above 2 years of age. The shift in focus, allowed for a more concentrated learning to be done according to the accelerated pathway of the cANP in the UCD program. This resulted in a more wholistic approach to learning, allowing for deeper understanding regarding minor injuries presenting to UC clinics.

3. Results

The main result of the pilot project was the successful completion of the cANP's training and the registration of the candidate by the NMBI as a recognized ANP. The entire process takes, in normal times an approximate 9-12 months to complete, in the accelerated form due to recognition of prior learning by UCD. Within the broader context of training of doctors and nurses in UC, the normal length of the training for the fellowship program varies from 2-4 years dependent on the prior learning and experience of the trainee. In the UCD master's program, the normal expected completion timeframe is 2 years, based on a part-time basis for learning.

The issues identified at the start of the project was the historical methods used for teaching and training of postgraduate clinicians. The incorporation of lean methods would help streamline training and allow for a continuous improvement

process to be achieved as a result. This would result in learning being done in a more evenly fashion, the knowledge gained to be better retained. This has been evident with the ANP training pilot scheme, where the cANP was able to be trained within a period of months. This more streamlined process would allow for shorter certification period, whilst continuing to ensure high quality training is provided. In the ANP care provided model, the takt time would be more pertinent in the busier metropolitan clinics. In these clinics, the volume of patients attending, equate to small ED and therefore having ANPs working, would help take the burden off the clinicians in the clinic in dealing with minor injuries and illnesses. Providing a better service for the patients attending those clinics.

4. Discussion

This project has been a pilot program, investigating the adaptation of lean thinking and processes in the delivery of knowledge and skills for UC training by the RNZCUC and UCD ANP Master's Program in Dublin, Ireland. There have been several lessons learnt throughout the process that have potential implications for further implementation and roll out of the project. Additionally, lessons from this project could be used to inform other interested parties in setting up formalized training programs in other countries, such as the USA, UK, New Zealand, and the Republic of Ireland. The aim of any medical training program, undergraduate or postgraduate, is to produce clinicians who have the appropriate knowledge and skills to perform duties of treating patients with confidence and in a safe manner. However, at present, there is evidence from the work done that there is the continual feeling of being ill prepared for the work by graduates of medical school (8). The aim therefore provides good quality and target education to overcome this perennial problem. Some qualitative work done with residents have shown in the past that target workshops addressing a particular issue, improves confidence in clinicians to perform specific tasks (8). This acknowledgment represents a change in the approach to training. In the Ackerman et. al. study, as with this project, small, targeted teaching sessions were undertaken to address a particular issue. The findings of that study were that the education they received, increased the clinician's awareness of potential risk occurring, increased patient safety outcomes and reduced waste of duplication of appointments (9). All leading to better patient satisfaction scores and clinician's comfort in performing the required tasks. Using similar approach, this project, used the lean methodology of Kaizen Burst to teach the trainees and the Kanban Pull of the trainees to identify areas for improvements to be made during their training journey and process.

Measures to assess the overall effectiveness of the learning can be done at specific times throughout the training period as a way of ensuring overall quality of learning. Space should also be afforded to allow for periods of reflection by the trainee, to fully grasp the topics of learning. Self-reflection as previously discussed is a key component for EQ, which allows individuals to grow within the learning process and journey. Future implementations of the project could incorporate self-reflection as a teaching tool as well as teaching aid. The self-reflection practice should not only highlight errors or areas for improvement, but also include areas, situations, or clinical situations with positive outcomes (10). The empowering of clinicians (trainers) to enable them to impart knowledge and skill provides continual opportunity to make small and gradual improvements in trainees throughout their training and beyond. This facet also allows the clinician trainer to keep abreast of latest information that may become available. Additionally, the ability to provide feedback in a constructive and safe manner will allow for a better learning experience for the trainees. This relates to the lean systems of having continuous improvements, with Kanban pull from the trainees regarding their experiences of learning. Any long term sustained incorporation of this project nationally in New Zealand, or in other parts of the world including the Republic of Ireland would require the availability of well-trained educators to ensure the project's success.

Educators trained to understand the needs of trainees, to observe the trainees work and be able to address deficiencies and areas of lack through the observation of work is a crucial task. Although, the self-reflective practice has been mentioned, there are certain aspects where that practice may not uncover poor performance, for which independent and external review would be needed. The role of external review particularly in training is a well-known concept, particularly in high performance sports. In this sector, teams or individuals have a coach or team of coaches that can provide an external view of the way the individual or team is functioning and have suggestions for changes that would improve performance (11). Feedback received from the external observations of trainers by the trainees, should be actively sought. It should be viewed as part of the continuous improvement process, where areas identified as weak can be addressed, and areas of strength consolidated. This should in theory and in practice be an ongoing loop for both trainees and the trainer to allow for continuous learning, knowledge and skill iteration, and improvement to happen (12). Therefore, within the relationship of the trainee and trainer/supervisor there is the continuous Kanban pull feedback given by both parties to allow for both parties to be on the continuous learning curve.

The results of this project show the ability to successfully create a training pathway, adopting lean methodology in its delivery of skill and knowledge. This project and its scope could be used as a template for a wider trial for the nurse training pathway. Trained and empowered nursing staff have been shown to have better job satisfaction, which in turn

leads to better retention of staff and improved quality of patient care. All of these would result in improved income streams for the UC clinics. As the concept of UC is different in the various geographical locations i.e., New Zealand, Australia, USA and Ireland, the scope of training would be needed to be adjusted accordingly where applicable. Governance for the training would rest with the local authorities that oversee the practice of medicine in each jurisdiction. The setting up of the Australian Faculty and Faculty na hÉireann illustrates the desire to help establish UC worldwide.

Limitations of this project is several. Firstly, there was a small sample size of trainees used. This could potentially lead to selection bias. Secondly, the training that was undertaken was done in a small single center in Dublin. Additionally, the nature and case-mix that was encountered within the clinical setting may not be like those encountered elsewhere, both factors reduced the generalization of the project. Finally, the standards of UC in the Republic of Ireland may not equate to the standards that are prevalent elsewhere.

5. Conclusion

In conclusion, this project has shown the College a potential method for training of ANPs to an accredited standard in urgent care with the use of lean methods in the delivery of skills and knowledge training. The ability for institutions, such as the RNZCUC, to upskill and train the nursing workforce within the urgent care sector would provide added benefits for workforce recruitment, development, and retention. The recent COVID-19 pandemic has highlighted the need for a thriving urgent care sector, not just in New Zealand or Ireland but worldwide. The ability for the medical and nursing workforce within the sector to be agile and adapt to new working environments quickly is a way for urgent care to survive and thrive in the present and future. Urgent care has a role to play within the provision of healthcare in New Zealand and Ireland, with increasing demands on both general practice and the emergency departments. An agile and equipped workforce would be important in achieving this ambition. For the long-term strategy, authorities in both countries and beyond, would be best served looking at a fully functioning urgent care sector as a way of delivery of appropriate care to the public. A fully functioning urgent care service, funded either from the public sector or via private provision in an integrative manner would help towards this end.

Compliance with ethical standards

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Disclosure of conflict of interest

None conflict of interest to declared.

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