



Original research

Remote clinical decision making: Evaluation of a new education module

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1. Introduction

This paper reports on the outcomes and resulting recommendations for the Remote Clinical Decision Making (RCDM) education module developed by a collaboration between the University of the West of England (UWE) and the South Western Ambulance Service NHS Foundation Trust (SWASFT).

The education module was delivered at UWE and comprised a number of sessions delivered over eight full teaching days, several days apart. Participants provided a subjective evaluation through self-completion forms and pre-/post-module questionnaires assessing confidence in various aspects of RCDM.

1.1. Background

Remote Clinical Decision Making (RCDM) otherwise also known as telephone triage or telehealth, is increasingly being used internationally to manage the demand for various healthcare services; including primary care, emergency and unscheduled care, and even in some tertiary level care settings. Healthcare providers across the world are continually challenged to provide high-quality, cost-effective care to a rising and increasingly aged and chronically suffering population. Telephone triage is a well-recognised and an increasingly used method of managing and reducing this demand; with caller compliance and satisfaction often being high (Howell, 2016). Many countries worldwide use RCDM, such as Australia, the United States, Canada, New Zealand, the United Kingdom (UK), and other European countries, with assessments often being undertaken by experienced nurses and paramedics (Tran et al., 2017). In addition to being a strategy to managing increasing demand, it is also a strategy to manage geographical and topographical challenges in rural and remote settings where access to face-to-face healthcare is sparse and unnecessary extrication is expensive. This is especially important for emergency care services and ensuring that the limited ambulance resources are available to attend the most serious cases. The use of RCDM in UK ambulance services is a well-recognised strategy for managing rising demand and decreasing resources over recent years (Urgent and Emergency Care Review

Programme Team, 2015); however, there remains a lack of formalised RCDM education within these settings.

Currently, clinical decision-support software (CDSS) plays a major role in mitigating some of the risks associated with RCDM; including a lack of internationally formalised education. CDSS helps to structure a remote clinical assessment and is used to reduce the risks associated with working differently from the face-to-face practice many HCPs will be used to (Murdoch et al., 2015). Whilst exploring the effectiveness of existing telephone triage systems, a recent study identified that despite using generic CDSS packages many centres dealing with remote clinical triage recognised that some staff were more effective than others in recommended appropriate patient dispositions (Turnbull et al., 2014). Those with high closure or referral rates often attributed their success to the confidence and competence gained through years of direct face-to-face patient contact; something that not all RCDM clinicians will have. The use of CDSS should support existing practice knowledge and should not be mistaken for Clinical Decision -Making Software used by non-clinicians. Over-reliance on such systems may lead to unnecessary hospital admissions and inappropriate patient dispositions (Turnbull et al., 2012). The increased use of telephone triage across many healthcare settings has seen a general increase in workforce demand. Intrinsic to meeting this demand, however, is an acceptance that not all clinicians working within remote clinical triage have an extensive experience base from which they can draw and therefore they need to be developed in the post to achieve the best outcomes for their patients and employers.

A recent systematic review of the literature by Edirippulige and Armfield (2017) found a small amount of evidence of education and training in telehealth being provided at both university level and as vocational courses. These examples from five countries used conventional classroom-based delivery methods as-well-as e-learning. Edirippulige and Armfield (2017) concluded however that published evidence in the peer-reviewed literature on telehealth education and training is limited and the availability and nature of telehealth-related education and training for practitioners is not well understood. Rutledge et al. (2017) comment on a similarly small amount of data related to training and educational programmes for practitioners

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working in RCDM, and a need to provide specific training and education. It is increasingly recognised that specialised competencies are needed among RCDM HCPs to provide safe and effective services and to increase user confidence (Guise and Wiig, 2017). The training and education to support these competencies is however limited.

In response to this and the growing need to develop clinicians working remotely in areas such as 999 clinical hubs, GP out-of-hours or NHS 111 services, UWE and SWASFT collaborated to design a higher education module. This module was designed to give clinicians new to this area of practice the insight and confidence to practice, and to allow those existing RCDM clinicians the opportunity to consolidate and critically question their current practice. Historically nurses have predominantly undertaken RCDM in countries such as America, Australia, Sweden, and the UK in NHS Direct, NHS 111, and NHS 24 (Höglund et al., 2016). Over the last decade, however, other HCPs such as midwives, paramedics, and pharmacists have started to work in this way (Brady and Northstone, 2017); arguably making this module and the findings from this research applicable to a wide range of professionals and providers.

The overall aims of the module were to enable practitioners to be able to demonstrate an in-depth understanding of clinical decision support software (CDSS) and to be able to critically evaluate evidence-based best practice models and system-based approaches used in conjunction with such software. Furthermore, the module aimed to enable practitioners to demonstrate competence in clinical reasoning skills and to explore and critically appraise the legal and ethical principles that underpin the decisions they make. This could only be achieved through a critical evaluation of the roles and responsibilities of a remote clinical advisor and an in-depth understanding of the communication skills needed for remote clinical triage. These aims were explored through the following subjects (please see [Supplementary Figure 1](#) for the detailed syllabus):

- Decision-making and triage tools
- Medicolegal issues
- Communication Skills
- High-risk cases
- Complaints & Quality
- Managing falls
- Mental Health Crises
- Complex social cases remotely

The first five subject areas are outlined in the aims and objectives of the module; chiefly to explore and critically evaluate remote clinical practice. One such example ubiquitous to all RCDM practice is that of communication skills. The communicative demands in RCDM are high, and HCPs working in this area require high patient centred communicative competence and ability to listen, as their assessments and advice are based solely on verbal communication, and they cannot see the caller (Ernesäter et al., 2016). The communication skills element enabled clinicians to be able to adapt their current skills to working remotely, or to newly learn the communication skills required for safe practice. The subject areas of falls and mental health crises management however were included given that these conditions have historically resulted in calls to 999 services which do not result in transport to emergency departments (Marks, 2002); and thus may have been better managed remotely. More recent data from the South West of England specifically, highlights that falls among older people is by far the most significant contributor to demand for ambulances. Furthermore, it is estimated that the increased predisposition of those with mental health problems to access ambulance services is significantly influencing demand for ambulances also (Chalk et al., 2016). By better understanding the causes for rising demand for emergency services, such as falls and mental health issues, which can be caused by complex social situations, commissioners can employ strategies to better manage their limited resources. By specifically looking at the resending conditions remote

clinicians will most likely be assessing, services can better manage risk and effectively employ best practice models.

Edirippulige and Armfield (2017) and Rutledge et al. (2017) highlight a range of topics included on some of the identified training and education programmes. These topics included: defining telehealth, communication skills, CDSS, regulations, reimbursement, the security/Health Insurance Portability and Accountability Act, ethical practice, and user safety and satisfaction. Some of the topics described by Rutledge et al. (2017) are not applicable to some Western-based operating models and others, like the RCDM module, can be adapted to suit the service provider's needs. Subjects such as clinical decision-making, CDSS, medicolegal issues, communication skills, and quality, however, are synonymous to all areas of international practice; making this research valid to various health and educational providers.

The module consists of 6 taught days at university, one structured oral practical exam (SOPE) and one reflective assignment. The total notional study time for the module was calculated to be 200 h, divided between independent student time (152 h) and student/lecturer interaction time (48 h). The module was delivered using a blended learning methodology; incorporating technology-enhanced learning material, online web content, video presentations, lectures and seminars. The scheduled learning included lectures; case-based learning including small group work and seminar discussion. While the independent learning included essential reading, assignment and presentation preparation and completion.

1.2. Aims and objectives

The study had the aim of assessing the impact of the RCDM module. It had the following objectives:

1. To determine whether the module is successful in improving confidence in remote clinical decision making for HCPs.
2. To assess the perceived impact of the module on patient care.

2. Methods

2.1. Study design

2.1.1. Cohort study

2.1.1.1. Study subjects. The first cohort comprised thirteen students who were paramedics, nurses or midwives (not all of whom worked within SWASFT). This pilot ran from November 2015 to January 2016. The second cohort comprised thirty Specialist Paramedics in Urgent Care and ran from January to March 2016. All participants from both cohorts were invited to be interviewed. Only four participants agreed to be interviewed about their experience of the module and how it might have impacted on their clinical practice.

2.1.1.2. Data collection. Each participant was provided with an information sheet regarding the evaluation, making clear that the course was a pilot and was to be evaluated. Participants were asked to complete a consent form. A self-completion questionnaire was administered to all participants at the start of the module and was completed in person. Baseline information was collected on background demographic information, clinical practise experience and measures of confidence in the use of triage and making remote decisions. The confidence measures were collected again at the end of the module (in person on the day). Evaluation forms for each session were completed at the end of that session (collected in person by the relevant tutor). All forms were developed in-house. Anonymised, completed questionnaires and evaluation forms were keyed electronically by JJ. The evaluation form included five free text questions ([Box 1](#)), responses were analysed thematically and summarised.

Four semi-structured interviews were undertaken with willing students one month after module completion to explore experiences of

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