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Effectiveness of early assessment and intervention by interdisciplinary teams including health and social care professionals in the emergency department: protocol for a systematic review

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ABSTRACT

Introduction Finding cost-effective strategies to improve patient care in the emergency department (ED) is an increasing imperative given growing numbers of ED attendees. Encouraging evidence indicates that interdisciplinary teams including health and social care professionals (HSCPs) enhance patient care across a variety of healthcare settings. However, to date no systematic reviews of the effectiveness of early assessment and/or interventions carried by such teams in the ED exist. This systematic review aims to explore the impact of early assessment and/or intervention carried out by interdisciplinary teams including HSCPs in the ED on the quality, safety and cost-effectiveness of care, and to define the content of the assessment and/or intervention offered by HSCPs.

Methods and analysis Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses standardised guidelines, we will conduct a systematic review of randomised controlled trials (RCTs), non-RCTs, controlled before–after studies, interrupted time series and repeated measures studies that report the impact of early assessment and/or intervention provided to adults aged 18+ by interdisciplinary teams including HSCPs in the ED. Searches will be carried in Cumulative Index of Nursing and Allied Health Literature, Embase, Cochrane Library and MEDLINE from inception to March 2018. We will also hand-search the reference lists of relevant studies. Following a two-step screening process, two independent reviewers will extract data on the type of population, intervention, comparison, outcomes and study design. The quality of the studies will be appraised using the Cochrane Risk of Bias Tool. The findings will be synthesised in a narrative summary, and a meta-analysis will be conducted where appropriate.

Ethics and dissemination Ethical approval will not be sought since it is not required for systematic reviews. The results of this review will be disseminated through publication in a peer-review journal and presented at relevant conferences.

Strengths and limitations of this study

- This is the first systematic review to synthesise the evidence on the contribution of interdisciplinary teams including health and social care professionals to the quality, safety and cost-effectiveness of care in the emergency department (ED).
- Four databases covering the biomedical, nursing and allied health peer-reviewed literature will be searched.
- The review will include randomised (and non-randomised) controlled trials, controlled before–after studies, interrupted time series and repeated measures studies to limit potential confounding effects.
- The results of the review will inform future research on extended scopes of practice for allied health professionals in the ED to optimise models of emergency care.

Trial registration number CRD42018091794.

INTRODUCTION

Background

The significant growth in attendees at the emergency department (ED) has become a growing public health issue,[1] as it has been linked to reduced quality, safety and cost-effectiveness of patient care, as well as increased morbidity and mortality.[2 3] The reasons underlying the increasing number of patients accessing the ED are multifaceted, complex and both intrinsic and extrinsic to the ED. Extrinsic factors include population ageing, an increase in the number of people with long-term conditions, lack of cost awareness, organisational problems in primary

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care, convenience and accessibility, patients' subjective perception of illness severity and greater confidence in the ED compared with primary care services.[4] However, the significance of these extrinsic factors should not disempower EDs from improving their processes and work patterns to assist patient flow.[4] Excessive patient waiting, slow investigation turnaround times and delays in making key decisions regarding patient care are factors intrinsic to the ED which affect patient flow.[5 6]

In an attempt to optimise patient flow and throughput, a number of quality improvement strategies have been introduced to the ED, including triage, streaming and fast-tracking; these have shown some level of effectiveness in terms of reducing waiting times, ED length of stay or the number of patients leaving without being seen.[7] However, reaching conclusions on the effectiveness of such initiatives is currently hindered by considerable methodological and clinical heterogeneity across interventions.[5 8]

A strategy to sustain the increasing and complex demands of patients presenting at the ED is to improve staffing and workforce flexibility through the formation of interdisciplinary care teams.[9 10] Team-based healthcare is defined by Naylor and colleagues as '*the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively with patients and their caregivers—to the extent preferred by the patient—to accomplish shared goals within and across settings to achieve coordinated, high-quality care*',[11 12] and it has gained growing attention as a pathway to optimise the delivery of healthcare.[13] In line with this definition, there has been increasing interest in developing interdisciplinary teams in the ED that actively involve health and social care professionals (HSCPs) as they possess a diverse range of highly trained skills that can help to speed up and enhance the patients' throughput.[9 14 15]

Over the years, a number of HSCPs have extended their scope of practice to work within the ED, including physiotherapists (PTs), occupational therapists (OTs), medical social workers (SWs), pharmacists, and speech and language therapists (SLTs).[9] A number of studies have shown that PTs' extended role can benefit both patients' outcomes, for example, in terms of health outcomes or satisfaction[16 17] and ED performance, including reduced ED waiting times or length of stay.[18 19] Together with PTs, OTs have emerged as professionals operating in the ED to address the surge in the number of older patients with functional limitations,[20] contributing to reduce older patients' risk of falls as well as unnecessary hospital admissions.[20] Evidence also suggests that the implementation of medical SWs' skills in the ED enhances accessibility to social and community resources[21] and can serve to avoid unnecessary hospital admissions,[22] effectively bringing economic benefits.[23] Like PTs, clinical pharmacists (CPs) have worked in the ED for over 30 years offering a variety of services, from performing consultation to providing drug information or aid in poisoning cases. A recent systematic review showed that CPs can contribute to improve ED processes, reduce errors and enhance the quality of care while avoiding extra costs.[24] Lastly, there have been recent arguments to extend the role of SLTs to the ED[9 25]; for instance, collaborations between SLTs and emergency nurses (ENs) have been instrumental to create effective screening tools for dysphagia.[26] However, given the infancy of the SLT's role in the ED, the evidence on potential benefits is very limited.[9]

Examples of successful interdisciplinary teams in the ED that involve HSCPs have been highlighted in the literature, with outcomes including the prevention or reduction of unnecessary hospital admissions and costs, as well as patients' health and satisfaction.[27–29] This evidence supports the idea that early assessment and/or interventions by interdisciplinary teams comprising a HSCP in the ED can constitute a potential cost-effective solution to streamline patients and address their needs more effectively; however, while systematic reviews of the impact of HSCP teams in various care settings exist,[30–32] there is a gap in the literature with respect to a systematic appraisal of the effectiveness of interdisciplinary teams with HSCP members in emergency settings. Conducting a critical review of existing studies will enable the identification of the components of the assessment and/or intervention that could be used to optimise the implementation of models of emergency care.

Objectives

A systematic review will be conducted to address the following objectives:

1. To establish the impact of early assessment and/or intervention conducted by interdisciplinary teams with HSCP members in the ED on the quality, safety and cost-effectiveness of care of adults presenting to the ED.
2. To define the content of the assessment and/or intervention delivered by the HSCP team members.

METHODS AND ANALYSIS

A systematic review will be conducted to identify studies that have reported the effect of early assessment and/or interventions carried out by interdisciplinary teams with HSCP members in ED on the quality, safety and cost-effectiveness of care. The review will use the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standardised reporting guidelines,[33] and this protocol has been prepared in adherence to the PRISMA-Protocols (PRISMA-P) statement, as provided in the online supplementary file 1.

Eligibility criteria

Studies will be selected using the population, interventions, comparators, outcomes and study designs (PICOS) criteria (see the online supplementary file 2 for a full list of inclusion criteria).

Population

Studies will be included if they report about adults aged ≥18 years who present to the ED in need of care.

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Intervention

The review will focus on assessment and/or interventions carried in the ED by interdisciplinary teams which comprise one or more HSCP members. Building on the definition provided by Naylor and colleagues,[11 12] we define a team as an interdisciplinary group of two or more healthcare professionals who work collaboratively with patients to accomplish shared goals to achieve high-quality care in the ED. Specifically, studies will be included only if the following criteria are met:

1. The interdisciplinary team includes at least one of the following HSCPs: PT; OT; medical SW; CP; SLT.
2. The team operates within the ED (ie, studies will be excluded where patients are referred to a HSCP as secondary point of contact in a department other than the ED).

Comparison

Early assessment and/or intervention carried by HSCP teams will be compared with usual care or another active intervention.

Outcomes

The impact of the assessment and/or intervention provided by the interdisciplinary team will be appraised in terms of quality, safety and cost-effectiveness of care in the ED, including the following key outcomes: patients' waiting time; length of stay in the ED; number of ED re-visits; rate of hospital admissions; rate of incorrect discharges; patient's satisfaction; patient's health outcomes; morbidity; mortality and cost-effectiveness.

Study design

The review will include randomised controlled trials (RCTs), non-RCTs , controlled before–after studies (CBAs), interrupted time series (ITS) and repeated measures studies.

No restrictions in terms of language or date of publication will be applied. For articles not published in English, we will attempt to find translators or English translations.

Search strategy

A comprehensive search string has been developed by the authors and peer reviewed by the dedicated Education and Health Sciences Faculty Librarian at the University of Limerick using the Peer Review of Electronic Search Strategies model.[34] Databases to be searched will include the Cumulative Index of Nursing and Allied Health Literature, Embase, the Cochrane Library and MEDLINE. Furthermore, the reference lists of included studies will be hand searched. Search terms are presented in the online supplementary file 3 and an example of preliminary MEDLINE search strategy is shown in table 1. All results will be imported into the Rayyan citation management software,[35] where duplicate citations will be screened and removed.

Study selection and data extraction

Screening

A two-stage process will be used to assess the results of the literature search. In stage 1, titles and abstracts will be screened by two independent reviewers (MC and RG) against the inclusion criteria; in stage 2, the selected full-texts will be screened to confirm inclusion in the final review. The screening process will be pilot tested in a calibration exercise prior to commencing the formal procedure. A comparison of included and excluded studies will be carried out by the two reviewers and discrepancies will be resolved by consensus or by a third reviewer (KR). A PRISMA flow diagram of progress will be completed for the selection process.

Table 1 MEDLINE (EBSCO) search strategy, modified accordingly for use in other databases (01/03/2018)

Search	Search string	Entries
#1	(MM 'Emergency Service, Hospital') OR (emergency room or emergency unit* or emergency department) OR ED	292 173
#2	Asses*	2 747 680
#3	intervention or treatment or therapy	6 963 104
#4	#2 OR #3	8 641 526
#5	#1 AND #4	139 886
#6	(MH 'Patient Care Team+') OR multidisciplinary OR care coordination OR integrated care OR collaborative care OR team based care OR interdisciplinary	21 719
#7	physiotherap* OR physical therap* OR occupational therap* OR social work* OR pharmac* OR (speech and language therap*) OR (speech therapy or speech patholog* or speech language patholog*) OR allied health	4 228 362
#8	#6 OR #7	4 415 350
#9	#5 and #8	27 164
#10	#9 Narrow by subject age: - adolescent: 13–18 years + all adult: 19+ years	8431

MH, MeSH Headings; MM, MeSh Major Topic.

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Data collection and extraction

One reviewer (MC) will extract data using a tailored data extraction form (see the online supplementary file 4). The extraction form will collect information related to the study citation, setting, objectives, data source and PICOS components (type of population, intervention, comparison, outcomes and study design). Detailed information will be collected in relation to the specific type of outcome (objective 1) and to the content of the assessment/intervention (objective 2). A second reviewer (RG) will then verify the extracted data. The Effective Practice and Organisation of Care Taxonomy[36] may be used to classify the intervention type. Potential confounding variables will be noted. Any disagreements in data extraction will be resolved by consensus. If the disagreement persists, a third author (KR) will independently extract the data. If a study presents missing, unclear or incompletely reported data, we will attempt to contact the study authors to obtain the data. The extent of missing data will be documented in the extraction form.

Assessing risk of bias

The quality of the studies will be critically appraised by two independent reviewers (MC and RG) using the Cochrane Collaboration's Risk of Bias Tool[37] to assess for the following types of bias: selection, performance, detection, attrition, reporting and other. CBAs will be assessed using the Cochrane criteria for CBAs, whereas interrupted times series and repeated measures studies will be appraised using the Cochrane criteria for non-randomised studies. For each of the above types of bias a judgement on the level of risk will be provided as either 'low' (unlikely plausible risk of bias that could alter confidence in the results), 'unclear' (plausible bias that raise a doubt of the validity of the results, due to lack of information or uncertainty over the potential for bias) or 'high' (plausible bias that seriously weakens the confidence in the results). Disagreements between reviewers will be resolved by consensus and a third reviewer (KR) will be asked to resolve disagreements if necessary.

Assessing the quality of the evidence

The level of certainty in the cumulative evidence will be assessed by employing the Grading of Recommendations Assessment, Development and Evaluation framework.[38] This provides an overall score (high, moderate, low or very low) to each outcome based on the quality, consistency, directedness and effect size of the reviewed evidence.

Data synthesis and analysis

Randomised and non-randomised studies will be reported separately. Where appropriate, a meta-analysis will be conducted using Review Manager V.5 software.[39] Dichotomous outcomes will be presented as risk ratios with 95% CIs, whereas for continuous outcomes, the mean difference between the intervention and control groups (with SD and 95% CIs) will be used as the mode of analysis. Heterogeneity between comparable studies will be tested using an I^2 statistic and considered statistically significant at $p<0.05$. We will interpret an I^2 value of 30%–60% as may represent moderate heterogeneity, 50%–90% as may represent substantial heterogeneity and 75%–100% as considerable heterogeneity.[40] A fixed-effects model will be used if clinical statistical heterogeneity is not evident (I^2 <30%). However, variation in studies with respect to populations, interventions, outcomes and settings is likely, in which case a random effects model will be applied. If sufficient data are available from the included studies, subgroup analyses will be conducted to compare the effect of the assessment or intervention on different target populations (eg, presenting to the ED with different conditions). We will conduct a sensitivity analysis to calculate the impact of risk of bias within studies on effect size, by calculating the effect of excluding or including studies with a higher risk of bias. Cluster-randomised trials will be assessed in order to ensure that appropriate analysis was carried out to address cluster effects and to avoid overestimating the significance of differences. In cluster randomised studies where the analysis was carried out ignoring the effect of clustering, efforts will be made to obtain the data needed to correct for this. Should the data not be forthcoming we will use the intracluster correlation coefficient or design effect from external sources (other trials included in the review) to inflate the SE so as to account for clustering as described in the Cochrane Handbook for Systematic Reviews of Interventions.[41] We will assess all non-RCTs, CBAs, ITS studies and repeated measures studies selected for inclusion to ensure that the appropriate analysis was carried out and, as for the cluster randomised trials, efforts will be made to obtain the data if necessary.

If statistical pooling is not possible, the findings will be presented in narrative form. Should a meta-analysis be not suitable, a tabulation and narrative summary of populations, assessment and/or interventions and outcomes will be completed to assist in determining what aspects of interdisciplinary assessment and intervention in the ED are the most suitable for different target populations.

Patient and public involvement statement

Patients and public will not be involved in this study. The research questions of this review were informed by the need for quality and timeliness of assessment and intervention in the ED expressed by health service users at a Patient and Public Involvement initiative organised by the Health Service Executive's Advocacy Unit in Ireland (https://www.hse.ie/eng/about/who/qid/person-family-engagement/listening-reports/listening-report-16.pdf).

DISCUSSION

As EDs worldwide are faced with increasingly complex demands, scientific evidence is needed for the implementation of novel cost-effective models of care. An accumulating academic literature indicates that interdisciplinary teams of

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HSCPs can enhance the quality of care provided in healthcare settings thanks to a more collaborative and comprehensive approach to the patient, and there is encouraging evidence on the benefits of using team-based care in emergency settings. The findings of the review will bridge a gap in the literature and provide robust evidence on how patient and process outcomes in the ED can be improved by quantifying the impact of early assessment and/or interventions provided by teams that include HSCPs, as well as by identifying the most effective components of the services provided. Not only this is information is crucial to future research on extended scopes of practice for allied health professionals in the ED, but it has important implications for decision-making.

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Competing interests None declared.

Patient consent Obtained.

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Data sharing statement No datasets or repositories will be used for the review.

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