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The role of tactical decision games (TDGs) as a novel method of teaching non-technical skills (NTS) to final year medical students

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Background

Non-technical skills (NTS) can be defined as “the cognitive, social and personal resource skills that complement technical skills, and contribute to safe and efficient task performance” (Flin et al. 2008). Key NTS required by newly qualified doctors are decision-making, situation awareness, task management and teamwork (Mellanby et al. 2014). Previous research has demonstrated junior doctors and their supervisors perceive that newly qualified doctors have difficulty demonstrating effective NTS behaviour. (Brennan et al. 2010; Tallentire et al. 2011; Tallentire et al. 2012). There is therefore a need to understand how medical schools can better develop students’ NTS.

Tactical decision games (TDGs) are low-fidelity classroom-based activities designed to increase proficiency in NTS (Flin et al. 2008). TDGs consist of a developing emergency scenario e.g. a plane crash where participants have a time-limited period to decide on a course of action as an individual and as a group. A facilitator then leads discussion around decisions made by the group, and the rationale underpinning these decisions. TDGs have been widely used in non-medical domains such as the US marines, military, police and oil and gas industries (Schmitt 1996, Crichton et al. 2000). Using TDGs to develop undergraduate medical students’ NTS does not appear to have previously been studied. The overall aim of this project was to explore the use of TDGs as a novel method of developing NTS in final year medical students/junior doctors.

Aims/Research Questions:

- 1) To explore the feasibility and acceptability of using non-medical TDGs to develop NTS in final year medical students (Phase 1).
- 2) To explore the influence of non-medical TDG participation on medical students’ recognition and understanding of NTS in an acute care simulation (Phase 2).
- 3) To explore the feasibility of using medical TDGs to develop NTS in final year medical students (Phase 3).

Methods

The University of Edinburgh College of Medicine and Veterinary Medicine Committee on the Use of Student Volunteers prospectively approved all of this work.

Phase 1) - Two non-medical TDGs (a plane crash and a shipwreck scenario respectively) were piloted in separate sessions within the University of Edinburgh Centre for Medical Education (CME). Thereafter, 38 Year 5 students voluntarily participated in a non-medical TDG session in four groups of between eight and 13 students respectively. Within each session, students were randomly allocated into two groups with all students directly participating in a TDG and observing their peers participating in another TDG. Feedback and discussion followed each of the TDGs,

using a validated NTS behavioural marker system (Mellanby et al 2014). The sessions also included a short presentation on NTS between the TDGs focussed on the importance of NTS in acute clinical contexts. Sessions were video-recorded and field notes made by ID. Students then participated in an acute care simulation scenario that gave them the opportunity to apply the NTS they had learned about in the TDG session. Focus groups were then used to evaluate students' perceptions of the TDGs. 28 students participated in a focus group, with the remaining students unable to attend mainly due to scheduling conflicts e.g. rotating onto night shifts. A total of five focus groups, each comprising between four and seven students and lasting between 60 and 90 minutes, were undertaken. The focus groups were audio-recorded and transcribed verbatim. Transcribed data was subsequently thematically analysed by ID and GS with the aid of NVivo Version 10 (QSR International Pty Ltd, Doncaster, Vic, Australia) software.

Phase 2) - This study directly followed on from the Phase 1 feasibility and acceptability study. The same two generic/non-medical TDGs used in Phase 1 were also used in Phase 2 with data from Phase 1 confirming that students highly valued participating in these TDGs. A total of 17 students participated in a non-medical TDG session in a total of three groups each containing between four and seven students. Students in larger groups directly participated in one TDG and observed their peers participating in another TDG while students in the smallest group directly participated in two TDGs. Feedback and discussion followed each of the TDGs, using the validated NTS behavioural marker system. At the end of the session students were given a printed copy of the behavioural marker system. Sixteen students subsequently participated in an acute care simulation scenario in groups of between two and six students. The acute care simulation scenarios, developed by individuals trained in simulation-based education, were extensively piloted and iteratively developed in Phase 1 prior to their use in Phase 2. Scenarios were designed to cover clinical presentations commonly faced by junior doctors and included acute pulmonary oedema, post-operative sepsis and an acutely confused patient. The acute care simulation scenarios were all video-recorded to allow the researchers to analyse students' NTS behaviour. All students actively participated in at least one simulation scenario whilst some students also had the opportunity to observe their peers participating in a scenario. Video-stimulated debrief interviewing (VSDI) was then used to explore students' real time and early reflective understanding of their NTS behaviours within the scenarios. A total of eight VSDIs were carried out with four of the eight interviews including observing students who provided a complementary perspective and also contributed to probing the thought processes of the participating students. ID has been trained in simulation debriefing and conducted all interviews. The VSDIs were audio-recorded and transcribed verbatim. Transcribed data was subsequently thematically analysed by ID and TL with the aid of NVivo Version 10 software. A template analysis approach was used with components of the behavioural marker system serving as initial coding categories but allowing for the development of additional categories during coding.

Phase 3) – ID developed two acute medical TDGs, drawing on lessons learned from Phases 1 and 2. Their development was informed by input from medical and nursing colleagues with an interest in NTS including JS and SMW and subsequently an expert-panel meeting with two national experts in NTS and simulation-based education. The medical TDGs were written to contain common tasks that the students could expect to encounter in their first year of clinical practice. 24 students participated in a medical

TDG session in groups of six students. All students participated in both medical TDGs. There was a presentation and discussion about NTS between the two medical TDGs. All medical TDG sessions were audio-recorded. Focus groups were used to gauge students' perceptions of participating in the medical TDG sessions and inform the development of subsequent sessions. All 24 students participated in a focus group which each comprised of six students. Transcribed data from the medical TDG sessions and focus groups was then thematically analysed by ID and SK with the aid of NVivo software.

Progress to date

Phase 1 – A paper detailing the findings of Phase 1 has been submitted and is currently under review. Six key themes emerged from the data: “the value of non-medical games”; “giving and receiving feedback”; “observing and reflecting”; “recognising and understanding NTS”; “dealing with uncertainty and ambiguity” and “introducing TDGs into the curriculum”. This work has been presented as an oral presentation at both the Association for the Study of Medical Education (ASME) and Association for the Study of Medical Education in Europe (AMEE) annual scientific meetings in 2014. The work was nominated for a Teaching Innovation Award at AMEE 2014 (12 nominations from more than 800 submissions).

Phase 2 – Preliminary analysis of Phase 2 has been undertaken and the research team are currently discussing final themes prior to writing a paper that we plan to submit. Five key themes emerged from preliminary analysis of the data: “situation awareness and fixation”; “expectations influencing behaviour”; being uncomfortable with uncertainty”; “transmitting and receiving information” and “working with peers and seniors”. This work has been presented as an electronic poster (e-poster) presentation at the AMEE 2015 annual scientific meeting.

Phase 3 – Data analysis is currently in the process of being completed. In due course, it is planned that this will lead to a further paper being submitted. The medical TDGs that have been developed will now be incorporated into the Year 5 MBChB student assistantship programme in March 2016.

Output

The following presentations have been given based on the work described above:

Drummond ID. Tactical decision games and non-technical skills. Royal Infirmary of Edinburgh renal unit meeting. Edinburgh 2015. (Oral presentation).

Drummond ID. Tactical decision games and non-technical skills. South-East Scotland Human Factors interest group. Edinburgh 2015. (Oral presentation).

Drummond ID, Sheikh G, Lamb T, Skinner J, Wood SM. Exploring the influence of participating in tactical decision games on medical students' recognition and understanding of non-technical skills. Association for Medical Education in Europe (AMEE). Glasgow 2015. (Poster presentation).

Drummond ID, Skinner J, Wood SM. Exploring the role of tactical decision games (TDGs) as a novel method of teaching non-technical skills (NTS). Association for Medical Education in Europe (AMEE). Milan 2014. (Oral presentation).

Drummond ID, Skinner J, Wood SM. Exploring the role of tactical decision games (TDGs) as a novel method of teaching non-technical skills (NTS). Association for the Study of Medical Education (ASME). Brighton 2014. (Oral presentation).

Drummond ID. Exploring the role of tactical decision games (TDGs) as a novel method of teaching non-technical skills (NTS). Scottish Clinical Skills Managed Educational Network (CSMEN) Research and Development conference, Stirling, 2014. (Oral presentation).

Prizes and Awards

Exploring the role of tactical decision games (TDGs) as novel method of teaching non-technical skills (NTS) nominated for Patil Teaching Innovation Award at AMEE 2014.

On-going and future work

A) Dissemination

- Phase 1: Await response from journal and proceed as appropriate.
- Phase 2: Achieve consensus on final themes, complete writing of paper and submit.
- Phase 3: Complete data analysis, decide on journal for submission, write paper and submit.

B) Implementation

- Delivery of developed medical TDGS to all (approximately 280) year 5 MBChB students in student assistantship March 2016. This will involve recruiting and training a team of facilitators to deliver the sessions in groups of between 10 and 12 students (approx. 28-30 workshops to be delivered). These sessions will require to be evaluated to ensure that they continue to meet NTS objectives when delivered by facilitators other than ID.
- ID is now working with an NHS Lothian Clinical Development Fellow (CDF) with a view to developing further renal/medical TDGs to introduce into the Year 4 renal curriculum.

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