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Morris Gordon 1,2, Elaine Uppal 1, Kath Holt 1, Jeanne Lythgoe 1, Allison Mitchell 1, Caroline Hollins-Martin 1

1. *Faculty of Health and social care, University of Salford, Salford, UK*
2. *Department of Neonatology, Royal Bolton Hospital, Bolton, UK*

**Corresponding Author**: Dr Morris Gordon

Mary Seacole Building, MS 3.48,

Frederick Road Campus,

University of Salford,

Greater Manchester,

M6 6PU

Email: [morris@betterprescribing.com](mailto:morris@betterprescribing.com)

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**Abstract**

Medical educators face significant challenges trying to improve teamworking skills, with a lack of clarity on how to teach and evaluate such skills. Previously, the team objective structured clinical encounter (TOSCE) has been reported as a teaching and assessment tool, but it has been used primarily in homogenous groups of undergraduates. We set out to evaluate the TOSCE as a teaching intervention amongst a large interprofessional group of postgraduate nurses and midwives. After the TOSCE, 83% of participants reported they were more aware of potential weaknesses in teamworking and 60% felt more able to work in a team. Mean Likert scale ratings were 4/5 for usefulness, enjoyment and relevance. The TOSCE is a feasible tool for teamwork training in the demanding postgraduate multidisciplinary setting and requires further investigation to ascertain its potential for formative and summative assessment of skills.

**Introduction**

Teamworking is key to the successful delivery of healthcare. There is growing evidence that education directed at interprofessional groups can have positive outcomes for teamworking and for patients (Reeves 2008). As such, Interprofessional Learning (IPL) is now key in Health Professional curricula (Cooper 2001; Reeves 2008; Verma 2006). There is a need for effective IPL teaching tools, with research highlighting weaknesses in existing methods (McNair 2005; Parsell 1998; Pecukonis 2008), as well as a need for teamworking assessment tools (Brown 2002). McMaster University and the University of Ottawa recently developed such a tool - the Team objective structured clinical encounter (TOSCE) - based on the Objective Structured clinical evaluation (Harden 1979) and team-based assessment literature (Singleton 1999; Morison 2005).

A TOSCE brings together a team of healthcare professionals for a simulated clinical meeting. This involves the review of trigger materials, with participants taking on different roles and developing a common plan. An assessor observes this interaction using a validated assessment tool and offers feedback. The TOSCE approach is theoretically grounded, maximising learning potential. It sharpens student proficiency through rehearsing responsibilities (Howarth 2006) and challenges inaccurate stereotyping of roles (Cooper 2001; Hean 2006; Jacobsen 2009). It diminishes negative hierarchical influence by increasing patient advocacy (Hollins Martin 2004, 2005, 2006). It also challenges bystander apathy, as described in social science theories concerning diffusion of responsibility (Darley 1968). Feasibility, acceptability (Marshall 2008), validity and reliability data have all been positive.

Investigation of the TOSCE has been in the undergraduate setting with predominantly medical students. This clearly ignores the very style of working that the tool is encouraging and does not follow a situated cognition view of learning, with students taking on roles that do not relate to their professional identity (Wilson 2000). Additionally, as this work was in primary care, using isolated groups, it is difficult to comment on feasibility within a postgraduate training environment, where there are often large groups of students to be trained during limited release from work.

We set out to pilot the use of TOSCE as an IPL teaching tool to support teamworking skill development in a group of postgraduate health professionals and assess its acceptability and effectiveness.

**Methods**

Classroom activities using TOSCE as a teaching intervention was carried out.

**Participants**

Participants consisted of a large group of interprofessional postgraduate nurses and midwives (n = 45). The group incorporated (n = 30) midwives and (n = 15) neonatal nurses on day release as part of postgraduate studies. Four educators were required to deliver the 3 hour teaching session. Initially, students were given a brief introduction and shown a video of a famous airline disaster, designed to stimulate a discussion surrounding errors from teamworking. This was followed by a short presentation on how failures contribute to non-technical skill errors.

The next step involved allocation of participants into mixed groups of 7-8 learners. Three teams, each with one staff observer, completed a TOSCE simultaneously, with the other 3 groups receiving a session on related issues with the last staff member. Each team member was provided with information to share in the meeting appropriate to their normal role. A short video introducing the case vignette (Online appendix 1), which was related to child safeguarding, was shown and subsequently the team was given 20 minutes to conduct their meeting. After a 20 minute break, students were given 20 minutes of feedback (Mcmaster 2012). In total, each TOSCE lasted approximately 1 hour. At this point, the groups swapped and the remaining 3 teams completed their TOSCE.

**Evaluation**

Prior to the session, students completed the T-TAQ teamwork attitudes questionnaire (Baker 2010). Post TOSCE, they completed a further evaluation form consisting of closed, Likert and free text responses and another T-TAQ questionnaire.

**Results**

Post TOSCE, 83% of participants were more aware of potential weaknesses in teamworking, 70% were more conscious of their own abilities, 65% felt more able to challenge poor behaviour from colleagues, and 60% perceived that they had greater ability to work in a team. Mean Likert scale ratings were 4/5 for usefulness, enjoyment and relevance. Team working attitudes were measured using the T-TAQ instrument and report as improved (pre-mean 127, post-mean 131), although this was not statistically significant.

Verbal debrief of staff participants revealed great enthusiasm for delivering TOSCE as a teaching method. However, some concerns were raised about the size of the groups, with it suggested that group numbers should be limited to 5 or 6 participants, as it was perceived that this would make observations and feedback easier and allow greater time for participants to have a meaningful role.

**Discussion**

In this instance, TOSCE was successfully incorporated into a session on teamworking skills for postgraduates and delivered to a large group of students within the limitations of their schedules. This is a key development, as previous work has used small groups of students on placement where time is more flexible. In addition, the session was accepted as a valuable teaching method by a group of experienced health care professionals, with apparent positive changes in their levels of confidence in teamworking, as well as an indication of improved attitudes.

Whilst the TOSCE tool has already been extensively evaluated, this study represents a significant innovation, proving that the tool can be used as an actual IPL learning intervention, rather than to simulate such an encounter. In this context, TOSCE was found to be an acceptable, feasible and effective method (at least in terms of enhancing perceived skills), for bridging the gap between teamworking curriculum outcomes and skill improvement. As work in patient safety highlights the role of teamworking (Gordon 2012), the TOSCE tool offers a useful option to educators of all the healthcare disciplines and appears to be practically deliverable without significant investment.

As this is a pilot study, clearly the strength of these findings is limited. In particular, the sample size was small and the evaluation was post-intervention, with no baseline for comparison. Additionally, the T-TAQ survey did not reveal statistically significant results and it is difficult to gauge if this is related to the tool itself or the sample size. Given the potential uses of the TOSCE tool for continuing professional development, as well as for revalidation or assessment of professionals, further research is required. Further efforts should aim to assess the utility of the tool to enhance behaviour within the workplace and over the long term, as well as its impact on outcomes for patients. Moreover, work is needed to assess validity as a summative assessment tool in the proposed setting.

**Conclusions**

The TOSCE is a feasible tool for teamwork training within a postgraduate interprofessional learning environment. In this study it was well received and improved perceived skills in teamworking. However, further work is required to explore its more sustained use within the setting used, with an aim to assess impact on patient care through a more robust investigation.

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