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Technical skills for basic scientists- Hands on skills in basic science courses is appreciated and promotes employability/life skills which otherwise are difficult to demonstrate to employers

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Students studying physiology undergraduate programmes often report aspirations of careers in clinical practice and clinical investigation (Steele *et al.*, 2020), which are heavily skills-based and theoretically grounded. Previous evidence suggests that simulation-based learning improves perception of life skills, motivation and self-efficacy in nursing students (Roh & Kim, 2015). However, evidence is limited in student perception of confidence and understanding gained from simulation-based learning in the study of basic sciences. This study aims to assess student perception of clinical based skills training and simulations in students studying degrees in the field of Physiology.

This study was approved by the Science and Engineering Research Ethics Committee, Manchester Metropolitan University. Anonymous surveys were conducted with students enrolled on the unit "Cardiovascular Science", a level 6, 15 credit undergraduate unit as part of the degree programmes BSc (Hons) Human Physiology or BSc (Hons) Sports Science and Human Physiology during 2020-21. Students were surveyed following clinical sessions, one after a skills session to practice Basic Life Support (BLS), another using high-fidelity patient simulators to diagnose signs of myocardial infarction (Sim). Surveys were conducted in Microsoft Forms. Each session survey assessed enjoyment, understanding/confidence, transferrable skills and problem solving, all assessed using a scale from 1 to 5 (1=negative, 5=positive). Students also surveyed on completion of all teaching (n=7), assessing perception of understanding, confidence, overall study experience and whether skills practiced add to students' overall physiology skills, assessed on a scale of 1 to 3 (1=negative, 3=positive). Students were optionally asked for free text comment on all surveys. Free text was analysed qualitatively for themes. Quantitative data is presented as Mean±SD of responses.

Combined, (n=21 responses, BLS; n=12, Sim; n=9) both clinical skills sessions were enjoyed (Combined rating: 4.8/5±0.4) with students also reporting confidence and understanding in the theoretical basis of the skills practiced (Combined rating: 4.6/5±0.6). Students also felt these experiences provided transferable clinical skills relevant to employability (Combined rating: 4.7/5±0.6) and developed ability to solve problems (Combined rating: 4.4/5±0.7). Optional free text comments received were also universally positive and provide indication that students feel the sessions developed employability skills relevant to future career development (Table 1).

In the post unit survey (n=7, all self-reported attending at least one clinical skill session), all students surveyed reported that the addition of clinical skills sessions aided understanding of theory (3.0/3±0.0). Students reported confidence in applying theory to practical scenarios (2.7/3±0.5) and skills sessions positively added to overall study experience (2.9/3±0.4). Overall, students felt the skills practiced also positively added to overall physiological skills (2.7/3±0.5). Optional free text comments indicates students find the sessions useful as "...really informative

putting theory into practice”, “Practical application of theory”, “Interactive learning” and “Add more practical’s”.

These findings suggest students feel perceived confidence and improved understanding in the theoretical concepts when “traditional” lecture, lab and tutorial activities are supplemented by specific clinical skills not normally associated with the teaching and learning of theoretical concepts in physiological sciences.

References: Roh YS & Kim SS. (2015). Integrating Problem-Based Learning and Simulation: Effects on Student Motivation and Life Skills. *CIN: Computers, Informatics, Nursing* 33, 278-284.
Steele KJ, VanRyn VS, Stanescu CI, Rogers J & Wehrwein EA. (2020). Start with the end in mind: using student career aspirations and employment data to inform curriculum design for physiology undergraduate degree programs. *Advances in Physiology Education* 44, 697-701.