



Assessing the Effectiveness of Using Simulation in Cupping Therapy Training Course for Undergraduate Medical Students: A Study in Riyadh, KSA

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Authors' contributions

This work was carried out in collaboration between all authors. Authors TSA and MK designed the study and performed the statistical analysis. Author TSA wrote the first draft of the manuscript and designed scenarios. Authors NAQ, ATEO and IAS reviewed the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To assess effectiveness of using cupping therapy simulation for the training of undergraduate medical students.

Study Design: This study assessed the experience of the cupping simulation for undergraduate medical students as a part of cupping training course. The place of the study was the simulation

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laboratory of the College of Medicine, Dar Al-Uloom University.

Methodology: NCCAM developed cupping simulation training course in the form of two scenarios that addressed the various types of cupping procedure. Fourth year undergraduate medical students; 16 males, and 25 females who attended the cupping simulation training course as a part of the complementary medicine and integrative health elective course are the target population. The number of participants was 25 out of 41. Post simulation survey was conducted by using a slightly modified Simulation Effectiveness Tool [SET].

Results: Showed positive responses on all items of the post-simulation survey. Developing a better understanding of cupping, building confidence, improving skills, and feeling better prepared for performing cupping for real patient were the most strongly agreed items.

Conclusion: Cupping simulation is a promising learning tool in the field of integrative medicine. It may improve the cupping clinical skills, and build the confidence of participants in a safe environment. It can be the first step of training for beginners. Future large-scale studies and post-simulation evaluation of performance are recommended.

Keywords: Cupping; simulation; education; medical.

1. INTRODUCTION

Cupping is a physical treatment which utilizes a cup to create suction over a painful skin area [1]. Cupping is a worldwide traditional therapy. It is more popular in Asia, Middle East and Central Europe [2]. It is a cornerstone of traditional Chinese medicine that has been practiced for thousands of years [3]. Furthermore, cupping is a leading traditional practice in Saudi Arabia after religious and herbal therapies [4]. A published classification of cupping therapy types in 2016 broadly classified cupping types into six main categories [5]. Wet cupping, dry cupping, flash cupping, massage cupping, herbal cupping, facial cupping and magnetic cupping are popular forms of cupping therapy [5].

Albedah et al. [6] reported that cupping therapy adverse events were not rare, but infrequently reported. Scar formation, hyperpigmentation, skin infection, dermatitis bullae, burns, and anemias were reported. Most of cupping adverse events can be avoided by following infection control measures and a good training of cupping practitioners [6]. Furthermore, it was our hypothesis that simulation method can provide safe training for the beginners to practice cupping and develop better professional clinical skills without fear of these adverse events.

Simulation training method was used successfully in medicine since antiquity [7]. It was used in many medical specialties and for life support training programs [8]. Simulation-based training could allow trainees to acquire primary professional skills in a safe environment rather than to be trained for the first time on real patients [9].

Part task simulation trainers were models that utilized to represent only a part of the real thing and, usually it is a body part or structure. Part task simulation trainers were used to aid the acquisition of operational, technical, procedural or psychomotor skills [10]. National Center for Complementary and Alternative Medicine (NCCAM) is located in Riyadh, Saudi Arabia and is a part of the Ministry of Health. NCCAM developed a novel method which is using the artificial skin for part task trainer simulation in cupping therapy training [11]. Part task simulation artificial skin is obtained from a retailer source in China, [skin model surgical sutured skills training module, and model number was 45345]. The artificial skin was 180 * 100 * 25 mm in size and made from a non-toxic silicon material [11].

Some of simulation training benefits include standardization of training, clinical practice repetition without a risk of patients' harm; interactive learning, specific goal oriented program design and providing education focused training [12]. Positive responses of medical students and an increase of their interest in active learning were reported in previous simulation training researches and most of them asked for more simulation sessions [13].

The main objective of the cupping simulation course was developing professional skills such as: how to handle cupping instruments and equipment safely, how to prepare skin before treatment, how to use surgical blades or auto-lancet for performing wet cupping, how to do various types of cupping therapy while following strict infection control measures. Other objectives included providing the knowledge to build the

confidence of the cupping trainees in a learner-centric environment, and to challenge the critical thinking and decision-making skills. The aim of this study was to assess the effectiveness of cupping simulation training course for undergraduate medical students of Dar Al-Uloom University.

2. METHODS

2.1 Overall Design

This study assessed the experience of the cupping simulation for undergraduate medical students as a part of cupping training course. The course was conducted followed by evaluation of effectiveness using a modified Simulation Effectiveness Tool (SET) [14] as a post-simulation survey. Modified (SET) items were shown in Table 1. Participation was voluntary. Ethical considerations were ensured through approval of the ethical committee of the National Center for Complementary and Alternative Medicine (NCCAM) in Riyadh.

2.2 Target Population

Fourth year undergraduate medical students; 16 males, and 25 females who attended the cupping simulation training course as a part of the complementary medicine and integrative health elective course.

2.3 Participants

The place of study was the simulation laboratory of the College of Medicine, Dar Al-Uloom University. The number of participants were 25 out of 41 4th year undergraduate medical students, 10 of them were males, and 15 were females who returned the survey. They attended the cupping simulation training course as a part of the complementary medicine and integrative health elective course.

2.4 Course Description

2.4.1 Pre-simulation

Introductory lectures and videos were presented at the beginning of the cupping simulation training course that explained the history, types, mechanism of action, infection control measures, precautions, contra indications and how to perform various types of cupping. Students were expected to assess the case, discuss the

treatment options, develop a treatment plan, handle the skin effectively and use cupping instruments safely. They also expected to perform various types of cupping therapy according to their decisions, follow infection control measures and give patients the proper instructions and advices after cupping session.

2.4.2 Part task cupping simulation

Participants were expected to perform the cupping procedures the just reviewed. The steps included: hand washing, wearing personal protective equipment such as: gloves, masks,etc, disinfection of cupping equipment, skin disinfection, performing various cupping types (dry, flash and wet), handling of the skin, using the surgical blade and the auto lancing device for doing skin scarification in wet cupping safely, providing a professional wound care after wet cupping, and proper disposal of used materials.

2.4.3 Simulation scenario-1

A 54 years old male patient comes to the cupping clinic to seek cupping for health promotion purpose. He does not suffer from any diseases. He does not take any medications. He has a free past and family of chronic diseases, and previous surgical operations.

Goals of the scenario included: the effective methods to choose cupping therapy points for this patient, rules for choosing effective cupping therapy type, steps to develop the cupping therapy treatment plan, necessity of following infection control measures throughout cupping session, safest methods of using cupping therapy instruments and how to perform various types of cupping such as flash cupping, dry cupping and wet cupping effectively.

2.4.4 Simulation scenario- 2

A 32-year old female patient is suffering from low back pain for more than 2 weeks. She is taking paracetamol and anti-platelets tablets to relieve her pain. She is a known heavy worker. She has no other complaints. She has a free family and past history of chronic diseases, and previous surgical operations. She does not marry.

Goals of the scenario included: the suitability of cupping for this patient, other effective methods and treatment options such as changing lifestyle and exercise, verifying the diagnosis to exclude contra indication of cupping, rules for choosing

cupping therapy points and type, the necessity for evaluating coagulation and bleeding time before performing cupping therapy, the importance of patient referral to a specialist in some situations and following infection control measures.

2.4.5 Post-simulation

Slightly modified Simulation Effectiveness tool (SET) [14] as a post-simulation survey was conducted. It included thirteen items; eight for learning subscale and five items for confidence subscale shown in Table 1.

2.5 Data Analysis

SPSS statistical package V.20 was used for data entry and analysis. Paired Sample Correlation Test and Paired Sample T Test were performed to study the relation between confidence subscale and learning subscale.

3. RESULTS AND DISCUSSION

The response rate was (25/41) 61%. Five items had 80% or more "strongly agree" response which were: I developed a good understanding of the cupping therapy in the cupping simulation training (96%); Completing the cupping simulation training helped me understand well cupping lectures information better (88%); I feel more confident in my decision-making skills (84%); My assessment skills improved (84%); I feel better prepared to provide cupping for real patients (80%).

The least items had a "strongly agree" response percentage were usually patient-centric aspects. They were: I am more confident in determining what to tell the patient asking for consultation (48%), I am able to better predict what changes may occur with my real patients (56%) and I feel more confident that I will be able to give consultation regarding cupping to my real patient's condition (56%).

Three items had 16% or less "do not agree" response which were: debriefing and group discussion were valuable (16%); I learned as much from observing my peers as I did when I was actively involved in doing cupping for the simulated skin (4%); I was challenged in my thinking and decision-making skills (4%). Results were summarized in Table 1.

Simulation effectiveness tool was divided into two subscales. Confidence subscale included

five items (number 2,5,6,8,9). Learning subscale included eight items (number 1,3,4,7,10,11,12,13) Table 1. There was a significant positive correlation between confidence and learning subscales by performing Paired Sample Correlation test, but there was no significance between the two means in Paired Sample T-Test Table 2. These results showed that confidence increased significantly in relation to the amount of knowledge and skills learned.

This study presented a novel cupping simulation program in the field of complementary and integrative medicine. This program was designed to build the confidence and improve the clinical skills of the participants in a safe, unthreatened environment. The results of post simulation survey showed highly effective positive experience in most aspects. Majority of participants developed a better understanding of the cupping therapy and had a highest strongly agree response that showed the new cupping simulation program achieved one of the main learning goals. All participants felt better prepared to provide cupping for real patients. All participants felt more confident in their decision-making skills and their assessment skills were improved. These findings supported the use of simulation program in improving confidence, critical thinking and decision making skills. Previous results of some simulation based training researches were consistent with the present study. Cleave-Hogg et al. [15] who studied experiential learning in an anesthesia simulation center and Lehr et al. [16] reported that most of their participants had positive learning experience.

One of the most important objectives of this simulation course is to build confidence of the trainees to practice cupping through simulation training and prepare them for the practice in real clinical environment. One of our important findings is the statistically significant positive correlation between confidence and learning subscales. It meant that the increased level of confidence is directly proportional to knowledge gained and learning. So, cupping practice on a part task simulator in a safe environment without fear of errors can improve the clinical skills and knowledge of the participants that can build their confidence to practice in a real clinical environment. This result is congruous with Weller et al. [17] who reported that the main reasons for increasing confidence after simulation based-training included: opportunity to practice, better

teamwork, better communication and greater ability to stand back and re-evaluate, and Khunger et al. [18] who reported; simulation gave trainees the chance to avoid early errors and the difficult part of the surgical training. Furthermore, It allowed them to gain confidence before entering the real operating environment.

The patient-centric items had the least "strongly agree" percentages. This may be a common issue in simulation-based training. Simulation can be the first step of training towards the development of professional skills and confidence but not the final step. Issenberg et al. [19] reported that the simulation is unlikely to have a major impact on the training of practitioner-patient relationship because its major effect is on skills training through their ability to provide on-demand practice access.

It is wise to review our current simulation scenarios because of the novelty of providing simulation program in the field of cupping therapy, and the results of post-simulation survey. It is also recommended to construct more scenarios to develop effective thinking and decision-making skills. Debriefing can be evaluated and reconstructed to satisfy the training needs of medical students.

These study results are preliminary because of the lack of previous studies in the field of cupping therapy simulation, the lack of cupping simulation devices, the small number of cupping therapy standardization researches and the small number of sample size. However, this study can be replicated in the future on a large scale by using modified scenarios and more tools for evaluation of simulation course and performance of participants.

Table 1. Post simulation survey results

		Do not agree	Somewhat agree	Strongly agree
1	The instructor's questions helped me to think critically [L]	0	24%	76%
2	I feel better prepared to provide cupping for real patients [C]	0	20%	80%
3	I developed a better understanding of the cupping therapy in the Cupping simulation training [L]	0	4%	96%
4	I developed a better understanding of the cupping instruments that were in the Cupping simulation training [L]	0	24%	76%
5	I feel more confident in my decision-making skills [C]	0	16%	84%
6	I am more confident in determining what to tell the patient asking for consultation [C]	0	52%	48%
7	My assessment skills improved [L]	0	16%	84%
8	I feel more confident that I will be able to give consultation regarding cupping to my real patient's condition [C]	0	44%	56%
9	I am able to better predict what changes may occur with my real patients [C]	0	44%	56%
10	Completing the Cupping simulation training helped me understand cupping lectures information better [L]	0	12%	88%
11	I was challenged in my thinking and decision-making skills [L]	4%	40%	56%
12	I learned as much from observing my peers as I did when I was actively involved in doing cupping for the simulated skin [L]	4%	24%	72%
13	Debriefing and group discussion were valuable [L]	16%	20%	64%

C = Confidence subscale, L = Learning subscale

Table 2. Relation between confidence subscale and learning subscale

Subscale	Mean	SD
Learning subscale	1.74	0.26
Confidence subscale	1.65	0.32
Paired Sample Correlation	P-Value = 0.036*	
Paired Sample T-Test	P- Value = 0.601	

* Significance

The strengths of this study included a novel method of cupping therapy training, developing a novel cupping simulation course, and shedding a light for developing more simulation training programs in the field of complementary and integrative medicine. It could be one of the steps towards standardization of cupping therapy training.

4. CONCLUSION

Cupping therapy Simulation may be an effective way to develop clinical and professional skills in a safe unthreatened environment. It tends to provide unlimited controlled on-demand chances of practice. It can improve the learning experience, develop the clinical skills and build confidence of trainees to practice cupping. Future large-scale studies and post-simulation evaluation of performance are recommended.

CONSENT

Participation was voluntary. Return a completed questionnaire was considered consent.

ETHICAL APPROVAL

As per international standard, written approval of Ethics Committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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