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Using Simulation in Cupping Therapy Training Course for Undergraduate Medical Students: A Pilot Study in Riyadh, KSA.

Running title: Using simulation in cupping therapy training course.

Abstract:

Background: Simulation has been used successfully in medical training. It allows trainees to acquire primary professional skills in a safe, unthreatened environment. The use of simulation in the field of cupping therapy was a new idea developed by the National Centre for Complementary and Alternative Medicine (NCCAM) in Saudi Arabia.

Objective: to assess effectiveness of using cupping therapy simulation in training course for undergraduate medical students.

Methods: NCCAM developed cupping simulation training course in the form of two scenarios that addressed the various types of cupping procedure. Medical students (n=25) from Dar Al-UloomUniversity participated in cupping simulation scenarios. Post simulation survey was conducted by using a slightly modified Simulation Effectiveness Tool [SET].

Results: showed positive responses on all items of the post-simulationsurvey. Developing a better understanding of cupping, building confidence, skills improving, and feeling of better preparation 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. Further development and larger researchesare recommended in the field of cupping therapy simulation course.

Keywords: Cupping therapy, simulation course, undergraduate medical student.

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Introduction:

Cupping is a physical treatment [1] and a traditional therapy used worldwide which is more popular in Asia, Middle East and Central Europe[2]. It is a cornerstone of traditional Chinese medicinethat has been practised for thousands of years [3].It is a leading traditional practice in Saudi Arabia after religious and herbal therapies[4]. Cupping therapy has many new and ancient types. A classification of cupping therapy types was published in 2016 and 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].

In a review of pertinent literature, cupping therapy adverse events were not rare but infrequently reported [6]. Scar formation, hyperpigmentation, skin infection, dermatitis bullae, burn, and anaemiaswere reported. Most of cupping adverse events can be avoided by following infection control measures and a good practitioners' training [6]. So, 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 has been used successfully in medicine since antiquity [7]. It was used in many medical specialties and especially 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].

National Center for Complementary and Alternative Medicine in Riyadh Saudi Arabia, which is related to the Ministry of Health developed a novel method by using theartificial skin for part task-trainer simulation in cupping therapy training [10]. Part task simulation artificial skin is from a retailer source in China, [skin model surgical sutured skills training module, and Model Number: 45345]. The artificial skin was 180 * 100 * 25 mm in size and

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made from anon-toxic silicon material. It simulates the layers of the skin and subcutaneous fat and muscles [10].

Standardization of training, practice repetition without a risk of patients' harm, interactive learning, designing specific goal-oriented programs and providing an education focused training are some of many simulation training benefits[11].Previous simulation training researches reported positive responses of medical students, anincrease of their interest in active learning and most of them asked for more simulation sessions[12].

The main objectives of the cupping simulation course include: developing professional skills like; handling cupping instruments and equipment safely, preparing skin before treatment, using surgical blades or auto-lancet for performing wet cupping, practicing various types of cupping therapy while following strict infection control measures, building the confidence of the cupping trainees in a learner-centric environment, and challenging the critical thinking and decision-making skills.The aim of this study was to evaluate the effectiveness of cupping simulation training course in undergraduate medical students of Dar Al-UloomUniversity.

Methods:

Overall design:

This is a follow-up study to assess the experince of the simulation for undergraduate medical students as a part of cuppingtraining course. The course was conducted followed by evlaution of effectiveness using a modified Simulation Effectiveness tool (SET) [13] as a post-simulation survey.

Target population:

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Forth year medical students; 16 males, and 25 females participated in the cupping simulation training course as a part of the Complementary Medicine and Integrative Health elective course

Participants:

The study was conducted at the simulation laboratory in theCollege of Medicine, Dar Al-UloomUniversity.The number of participants was 25 out of 404Thyearmedical students, 10 of them were males, and 15 were females. They participated in the cupping simulation training course as a part of the Complementary Medicine and Integrative Healthelective course.

Course Description:

Pre-simulation:

The cupping simulation training course begins with introductory lectures and videos explaining in brief; the history, types, mechanism of action, infection control measures, precautions, contraindication of cupping and how to perform various types, then continues to ten minutes brief instructions and orientation review of the simulation process.. Students were expected to practice various cupping types in the general part-task simulation and to assess the case, discussing the treatment options, putting the treatment plan, handling of the skin and cupping instruments safely, performing various types of cupping therapy according to their decisions, followinginfection control measures and giving instructions and advice to patients after cupping session.

Part-task cupping simulation:

Participants were expected to do specific procedures that include: hand washing, wearing personal protective equipment such as: gloves, masks, ….etc, performing

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disinfection of cupping equipment, skin disinfection, performing dry, flash and wet cupping, handling of the skin, using safely the surgical blade for doing skin scarification in wet cupping, using auto-lancing device, care of wound after wet cupping, using cupping equipment, and proper disposal of used materials.

Simulation Scenario-1

A 54 years old male patient came to the cupping clinic for doing cupping for health promotion purpose. He did not suffer from any diseases and did not take any medications. His past and family history was free from chronic diseases, and previous surgical operations.Points reviewed in debriefing included:effective methods to choose cupping therapy points for this patient, rules for choosing effective cupping therapy type, the steps of putting the cupping therapy treatment plan, the necessity of following infection control measures throughout cupping session,the safest methods of using cupping therapy instruments and how to perform various types of cupping like flash cupping, dry cupping and wet cupping effectively.

Simulation Scenario- 2

A 32-year old female patient suffering from low back pain for more than 2 weeks was taking paracetamol for her pain together with anti-platelets tablets for relieving pain. She is a known heavy worker. She did not have any other complaints and had family and past history free from chronic diseases, and previous surgical operations. She was not married.

Points reviewed in debriefing include:suitablity of cupping for this patient, effective methods and options rather than cupping such as:changing lifestyle, 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

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therapy, the importance of patient referral to a specialist in some situations and the effective infection control measures regarding cupping therapy session.

Post-simulation:

Slightly modified Simulation Effectiveness tool (SET) [13] as a post-simulation survey was conducted. It included 13 sentences; eight for learning subscale and five sentences for confidence subscale.

Data analysis:

SPSS Statistical package V.20 was used for data entery and analysis. We performed Paired Sample Correlation test , and Paired Sample T Test to study the relation between Confidence subscale and learning subscale.

Results:

The response rate was (25/40) 61%. Five aspects had 80% or more "strongly agree"response: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: 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%).

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Three items had 16% or less concerning "do not agree"response : 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 dividedinto two subscales. Confidence subscale that included five questions(number 2,5,6,8,9) and learning subscale which included eight questions (number 1,3,4,7,10,11,12,13)**[Table 1]**.

We found 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]**. This results indicating that confidence is significantly increasing in relation to the amount of knowledge and skills learned.

Discussion:

This is 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 indicated highly effectivepositiveexperience in most aspects.Majority of participants developed a better understanding of the cupping therapy in the cupping simulation trainingcourse; with a highest strongly agree response that indicated the value of the new simulation program in the learning process. All participants felt better prepared to provide cupping for real patients, felt more confident in their decision-making skills and their assessment skills improved. These findings supported the simulation program value 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

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al. [2002] and Lehr et al. [2015] reported the positive learning experience of the most participants [14, 15].

One of the most important objectives of this simulation course is to build confidence through training to prepare the trainees for the practice in real clinical environment.A statistically significantpositive correlation between confidence and learning subscaleswas one of our important findingswhichmeans the increased level of confidenceis directly proportional to knowledge gained and learning.So, by practicing cupping on a part-task simulator in a safe environment without fear of errorcanimprove theclinical skills and knowledge of the participants that could build their confidence to practice in therealclinical environment.This result is congruous with Weller et al [2003] 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 [16], and Khunger et al. [2016] who reported; simulation gave the trainees the chance to avoid the early errors and the difficult part of the surgical training and, to gain confidence before entering the real operating environment [17].

The patient-centric items had the least "strongly agree" percentages. This may be a common issue in simulation-based training.Simulation could be the first step of training towards the developing of professional skills and confidence but not the final step. Issenberg et al. [2001] reported that the simulation is unlikely to have a major impact on the training of practitioner-patient relationship because itsmajoreffect is on skillstraining through their ability to provide on-demand practice access[18].

Because of the novelty of providing simulation program in the field of cupping therapy, and the results of post-simulation survey regarding, debriefing and challenging in critical thinking, it is wise to review our current simulation scenarios and develop more scenarios

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and evaluate them to challenge the participants more on their thinking and decision-making skills. Debriefing should be evaluated and reconstructed to satisfy the students' training needs.

Our results are tentative 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 standardizationresearches and the smallnumber of sample size.However, this pilot study can be replicated in the future on a large scale, with modified scenarios and by using more tools for evaluation of simulation course and students' performance.

Thestrengths 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.

Conclusion:

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

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%

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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%

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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.

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