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Obstetric Simulation Workshops in Uganda: A New Gateway to Healthcare Cooperation

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Abstract

In recent years, clinical simulation workshops have been widely utilized as a learning method in universities and teaching hospitals worldwide [1]. Clinical simulation refers to the fictitious execution of a complex clinical procedure with sufficient realism to facilitate the acquisition of theoretical and practical skills, including communication and coordination with medical staff, through immersion, practice, and feedback, while avoiding the risks inherent in real-life medical situations [1, 2]. Among its many benefits are a shortened learning curve, improved patient confidence, and enhanced competitive outcomes [2, 3].

On a global scale, postpartum hemorrhage (PPH) is one of the leading causes of maternal mortality. The global prevalence of PPH is 6%, with the highest burden observed in low- income countries [4]. In Sub-Saharan Africa, the prevalence is notably high, at 10.5%. In Uganda, PPH accounts for 25% of all maternal deaths [5]. However, there is limited information on the magnitude and risk factors associated with PPH, and most healthcare facilities either fail to estimate blood loss or only perform visual estimation, a method with significant inaccuracy. The few studies that have objectively measured postpartum blood loss have been conducted in high-income countries, where the birth environments differ significantly from those in low-income nations [5].

This study aims to evaluate the outcomes of two workshops: "Basic Assistance in Normal Delivery" and "Quantification, Prevention, and Management of Postpartum Hemorrhage" held in April 2024 at a hospital in Uganda. The objective is to assess the potential impact of these workshops on healthcare personnel in low-income countries.

Keywords: Postpartum Hemorrhage, Clinical Simulation, Obstetric Training, Uganda, Maternal Health, International Healthcare Cooperation, Skill Development, Low-Income Countries

Materials and Methods

This was a quasi-experimental pre-post learning study conducted at the Father Pio Health Centre IV in Kamwenge, Uganda, in April 2024. The study participants were voluntary medical staff from this health facility (midwives, general practitioners, nurses, and medical students). At that time, the hospital staff consisted of 2 general practitioners, 6 midwives, 6 nurses, and 1 medical student. Of the 14 available healthcare workers, 10 (71% of the sample) participated in the normal delivery workshop. This workshop had an estimated duration of one hour, during which participants, in groups of two, first received theoretical training on fetal position, fetal movements, the stages of labor, proper assistance during each stage, and the identification and management of common complications. Subsequently, they received practical training using a mannequin (constructed from a cardboard box simulating the maternal pelvis and a doll representing the fetus), where they could apply the theoretical knowledge acquired during the training.

In contrast, the postpartum hemorrhage workshop was attended by 12 participants (86% of the sample). This workshop also lasted for an estimated duration of one hour, during which participants, in groups of two, received theoretical training on the epidemiology of postpartum hemorrhage, its main causes, risk factors, how to identify it, how to perform a rapid intervention, how to carry out both subjective and objective quantification, and the importance of timely action. Afterward, they underwent practical training using a mannequin (constructed from a cardboard box simulating the maternal pelvis, a doll simulating the fetus, a marked bucket for objective counting, and a scale to weigh the materials), thus putting into practice the knowledge acquired in the theoretical training. The remaining healthcare workers did not attend the workshops due to unavailability during the scheduled times.

The Study Period was Divided into the Following Stages

Pre-workshop Confidence Assessment Test

- 3 questions assessing the degree of confidence (0-10) in performing maneuvers, as well as theoretical and practical knowledge.
- 9/10 questions assessing the degree of perceived safety (0-10) in performing specific procedures in the presence or absence of different healthcare professionals.

Workshop Implementation

Post-workshop Confidence and Utility Evaluation Test (Questionnaires 1 and 2):

- 3 questions assessing the degree of confidence (0-10) in performing maneuvers, as well as theoretical and practical knowledge.
- 9/10 questions assessing the degree of perceived safety (0-10) in performing specific procedures in the presence or absence of different healthcare professionals.
- 7 questions assessing the utility of the workshop (0-10) and whether they would recommend it to other healthcare workers.
- 4 questions assessing the overall experience of the workshop, two of which were open-ended.

The effectiveness of the workshop was evaluated using multiple-choice tests and self- administered questionnaires. Both workshops were conducted separately, following the same structure for each.

Results

Normal Delivery

The average age of the participants was 27.8 ± 4.3 years, and the group consisted of 6 midwives, 2 physicians, 1 nurse, and 1 medical student.

A significant improvement was observed in both theoretical and practical knowledge between the pre-workshop and post-workshop stages ($p < 0.05$). Both the questions related to confidence levels and those evaluating the safety of performing the procedures showed a statistically significant increase (an increase of 0.7–1.6 points on a 1–10 scale) (Table 1). Notably, the largest differences were observed in shoulder delivery (2.2 points, $p = 0.001$), likely due to the teaching of maneuvers for resolving shoulder dystocia if it were to occur. Other aspects that showed significant improvement included fetal head delivery (1.5 points, $p = 0.005$) and trunk and hip delivery (1.6 points, $p = 0.002$), which makes sense as these are the more practical aspects of the workshop and easier to practice with the simulator. In contrast, the aspect with the least improvement was the initial situation management (0.7 points, $p = 0.01$), possibly because, as it was a simulation, participants may not have fully immersed themselves in the scenario as they would have in a real situation.

Table 1: Analysis of the Difference Obtained in the Pre- and Post-Workshop Surveys on Assistance to Eutocic Birth in Relation to the Questions on the Degree of Trust and Security in the Entire Sample Group (N=10)

	Pre-W	Post-W	Difference	p-value
Theoretical skills	8,30 +/- 1,10	9,20 +/- 0,80	0,90	0,002
Basic concepts	7,40 +/- 1,30	8,80 +/- 0,90	1,40	0,002
Practical skills	8,10 +/- 1,30	9,20 +/- 0,40	1,10	0,009
Initial control of the situation	7,90 +/- 1,30	8,60 +/- 1,50	0,70	0,01
Second stage	8,30 +/- 1,30	9,4 0+/- 0,80	1,10	0,003
Delivery of the fetal head	7,70 +/- 1,70	9,20 +/- 0,80	1,50	0,005
Shoulder delivery	6,4 +/- 2,0	8,60 +/- 1,30	2,20	0,001
Trunk and hips delivery	7,50 +/- 1,30	9,10 +/- 1,20	1,60	0,002
Third Stage	8,00 +/- 1,80	9,30 +/- 0,90	1,30	0,01
Common complications	7,50 +/- 1,40	9,00 +/- 0,80	1,50	0,01
Assistance with obstetrics	7,40 +/- 1,00	8,5 0+/- 1,40	1,10	0,01
Assistance alone	7,10 +/- 1,10	8,40 +/- 1,00	1,30	0,0004

Furthermore, the utility of the workshop was assessed in the post-workshop survey (Table 2), where participants rated the following aspects on a scale of 1–10: whether the workshop was generally useful (9.9 ± 0.3); whether it improved their theoretical knowledge (9.6 ± 0.7) and practical skills (9.3 ± 1.1); whether they believed the training would reduce their stress when facing similar situations in the future (9.6 ± 0.7); whether they thought it was necessary to conduct both theoretical (9.1 ± 1.6)

and practical (9.9 ± 0.3) components of the workshop; and whether the workshop should be mandatory for medical or midwifery students (9.9 ± 0.3).

Table 2: Analysis of The Responses Obtained in the Post-Workshop Survey on Assistance to Eutocic Birth in Relation to the Degree of Usefulness

	Global analysis (n=10)	Midwives (n=6)	Non-midwives (n=4)
General utility	9,90 +/- 0,30	10,00 +/- 0,00	9,75 +/- 0,50
Improve theoretical knowledge	9,60 +/- 0,70	9,83 +/- 0,41	9,25 +/- 0,96
Improve practical knowledge	9,30 +/- 1,10	9,67 +/- 0,52	8,75 +/- 1,50
Stress reduction	9,60 +/- 0,70	9,67 +/- 0,52	9,50 +/- 1,00
Utility at theoretical level	9,10 +/- 1,60	9,50 +/- 0,84	8,50 +/- 2,38
Utility at a practical level	9,90 +/- 0,30	10,00 +/- 0,00	9,75 +/- 0,50
Mandatory for students	9,90 +/- 0,30	10,00 +/- 0,00	9,75 +/- 0,50

Finally, it is worth noting that 70% of the participants expressed curiosity about the workshop and provided positive feedback afterward, including comments such as:

- "It helps to improve skills and knowledge."
- "I think it is important for students to receive this workshop as we did, because it relieves stress and provides more guidelines for practice. Thank you very much, Idiwaka team."
- "I felt very happy and willing to learn."
- "The workshop experience was the best because it enhanced both my theoretical and practical skills in postpartum hemorrhage control and childbirth."
- "It was the best experience."
- "I had forgotten maneuvers for delivering/handling shoulder dystocia, but now I'm comfortable with it."

We also analyzed the results by dividing the healthcare workers into two groups: one group consisting of staff accustomed to assisting in deliveries in their daily clinical practice (the 6 midwives), and the other group comprising the remaining healthcare workers who did not typically assist in deliveries (general practitioners, nurses, and the medical student).

It is important to note that in the midwife group, the results remained positive and statistically significant in most cases (Table 3). Among the variables that did not show statistically significant results were the initial management of the situation (0.5 points, p = 0.148) and the management of common delivery complications (1-point, p = 0.102). The first result may be attributed to the fact that midwives face such situations daily, which limits the range of improvement in initial situation management. The second finding may be due to midwives being already familiar with the treatment of basic complications such as cord prolapse or mild postpartum hemorrhage.

Table 3: Analysis of the Difference Obtained in the Pre- and Post-Workshop Surveys on Assistance to Eutocic Birth in Relation to the Questions on the Degree of Confidence and Security in the Subgroup of Midwives (N=C)

	Pre-W	Post-W	Difference	p-value
Theoretical skills	8,83 +/- 0,98	9,50 +/- 0,55	0,67	0,013
Basic concepts	8,00 +/- 1,10	9,00 +/- 0,63	1,00	0,02
Practical skills	8,67 +/- 0,52	9,17 +/- 0,41	0,50	0,038
Initial control of the situation	8,50 +/- 0,84	9,00 +/- 1,55	0,50	0,148
Second stage	8,83 +/- 0,75	9,67 +/- 0,52	0,83	0,021
Delivery of the fetal head	8,50 +/- 1,05	9,50 +/- 0,55	1,00	0,055
Shoulder delivery	7,00 +/- 2,10	8,83 +/- 0,41	0,83	0,024
Trunk and hips delivery	7,83 +/- 1,17	9,33 +/- 0,52	1,50	0,03
Third Stage	8,33 +/- 1,63	9,83 +/- 0,41	1,50	0,046
Common complications	7,83 +/- 1,17	8,83 +/- 0,75	1,00	0,102
Assistance with obstetrics	7,50 +/- 1,05	8,83 +/- 0,98	1,33	0,021
Assistance alone	7,17 +/- 0,75	8,50 +/- 0,84	1,33	0,001

In the group of other healthcare workers (2 general practitioners, 1 nurse, and 1 medical student), who were less accustomed to attending normal deliveries but have the potential to do so, especially considering Uganda's healthcare needs and the country's high birth rate, a statistically significant improvement was observed in most parameters (Table 4). Only two variables did

not show statistically significant results, which were the same as in the midwife group: the initial management of the situation (0.5 points, p = 0.148) and addressing the main postpartum complications (1-point, p = 0.102). This suggests that these two aspects may not have been sufficiently addressed in the simulation workshop.

Table 4: Analysis of the Difference Obtained in the Pre- and Post-Workshop Surveys on Assistance to Eutocic Birth in Relation to the Questions on the Degree of Confidence and Security in the Subgroup of Non-Midwives (N=4)

	Pre-W	Post-W	Difference	p-value
Theoretical skills	8,83 +/- 0,98	9,50 +/- 0,55	0,67	0,013
Basic concepts	8,00 +/- 1,10	9,00 +/- 0,63	1,00	0,02
Practical skills	8,67 +/- 0,52	9,17 +/- 0,41	0,50	0,038
Initial control of the situation	8,50 +/- 0,84	9,00 +/- 1,55	0,50	0,148
Second stage	8,83 +/- 0,75	9,67 +/- 0,52	0,83	0,021
Delivery of the fetal head	8,50 +/- 1,05	9,50 +/- 0,55	1,00	0,055
Shoulder delivery	7,00 +/- 2,10	8,83 +/- 0,41	0,83	0,024
Trunk and hips delivery	7,83 +/- 1,17	9,33 +/- 0,52	1,50	0,03
Third Stage	8,33 +/- 1,63	9,83 +/- 0,41	1,50	0,046
Common complications	7,83 +/- 1,17	8,83 +/- 0,75	1,00	0,102
Assistance with obstetrics	7,50 +/- 1,05	8,83 +/- 0,98	1,33	0,021
Assistance alone	7,17 +/- 0,75	8,50 +/- 0,84	1,33	0,001

The largest areas of improvement were similar in both groups, with a notable improvement in managing the delivery of the placenta (for midwives, 1.5 points, p = 0.046; for others, 1.5 points, p = 0.046), and assisting during delivery, both with the presence of an obstetric specialist (for midwives, 1.33 points, p = 0.021; for others, 1.33 points, p = 0.021), and individually without the presence of other healthcare staff (for midwives, 1.33 points, p = 0.001; for others, 1.33 points, p = 0.001).

Regarding the analysis of the utility of the workshop in the post-workshop survey, it is noteworthy that all midwives gave the highest rating (10 ± 0) for the usefulness of the workshop, the necessity of conducting the practical component, and the requirement for this workshop to be mandatory for medical or midwifery students. This highlights that the midwives found the workshop extremely beneficial for their daily clinical practice and training. The remaining healthcare workers also highlighted the usefulness of the workshop (9.75 ± 0.50) and its mandatory nature for medical or midwifery students (9.75 ± 0.50).

Postpartum Hemorrhage

The average age of the participants was 28.1 ± 4.0 years, and the group consisted of 6 midwives, 2 physicians, 3 nurses, and 1 medical student. Between the pre-workshop and post-workshop stages, a significant improvement in both theoretical and practical knowledge was observed ($p < 0.05$). Both the questions related to confidence levels and those related to the safety of performing the procedures showed a statistically significant increase (an increase of 0.5–2.2 points on a 1–10 scale) (Table 5). Only two questions did not show a statistically significant difference between pre- and post-workshop results: the question "How would you assess your safety in managing postpartum blood loss?" (0.8 points, p = 0.1) and the question "How would you assess your safety in coordinating with other professionals present?" (0.5 points, p = 0.1). The first question may have lacked statistical significance because it was very broad and did not specifically assess any technique or parameter, making it difficult to evaluate comprehensively. As for the second question, it is likely that the small group size (one to two participants per session) and the absence of multiple specialists made it less effective in improving the coordination among healthcare professionals.

Table 5: Analysis of the Difference Obtained in the Pre- and Post-Workshop Surveys on Postpartum Hemorrhage in Relation to the Questions on the Degree of Confidence and Security in the Entire Sample Set (N=12)

	Pre-W	Post-W	Difference	p-value
Theroetical skills of BLQ	7,10 +/- 2,00	8,10 +/- 1,00	1,00	0,016
Basic concepts of BLQ	6,50 +/- 1,60	8,20 +/- 1,00	1,70	0,0002
Practical skills of BLQ	7,30 +/- 1,70	8,60 +/- 1,20	1,30	0,002
Assisting a bleeding	7,70 +/- 1,60	8,80 +/- 1,40	1,20	0,006
Bleeding control	7,80 +/- 1,60	8,50 +/- 1,40	0,80	0,1
Control the situation at first	7,40 +/- 1,80	8,30 +/- 1,40	0,80	0,03
Subjective quantification	6,90 +/- 1,60	8,20 +/- 1,30	1,30	0,001
Objective quantification	6,00 +/- 2,20	8,00 +/- 1,80	2,00	0,003

Difference mild/severe blood loss	7,50 +/- 2,30	8,60 +/- 1,20	1,10	0,04
Coordination	8,20 +/- 1,90	8,70 +/- 1,30	0,50	0,1
Prevention	7,30 +/- 1,70	8,80 +/- 1,30	1,50	0,0003
Assist with an obstetrician	6,40 +/- 2,70	8,60 +/- 1,50	2,20	0,002
Assist alone	6,40 +/- 1,90	8,10 +/- 1,50	1,70	0,001

The most notable improvement was observed in the knowledge of basic concepts regarding postpartum hemorrhage (1.7 points, $p = 0.0002$) and the management of obstetric hemorrhage, both with the presence of a specialist (2.2 points, $p = 0.002$) and without one (1.7 points, $p = 0.001$). This highlights the importance of the workshop in improving the quality of care for patients.

The utility of the workshop was also evaluated in the post-workshop survey (Table 6), where participants rated the following aspects on a scale from 1 to 10: whether the workshop was generally useful (9.6 ± 0.7); whether it improved their theoretical knowledge (9.4 ± 0.8) and practical skills (9.4 ± 1.0); whether they believed that receiving this training would reduce their stress when facing similar situations in the future (9.3 ± 0.9); whether they thought it was necessary to conduct both theoretical (9.3 ± 1.6) and practical (9.7 ± 0.9) components of the workshop; and whether this workshop should be mandatory for medical or midwifery students (9.9 ± 0.3).

Table 6: Analysis of the Responses Obtained in the Post-Workshop Survey on Postpartum Hemorrhage in Relation to the Degree of Usefulness

	Global analysis (n=12)	Midwives and doctors (n=8)	Nurses and students (n=4)
General utility	9,60 +/- 0,70	9,75 +/- 0,46	9,25 +/- 0,96
Improve theoretical knowledge	9,40 +/- 0,80	9,50 +/- 0,76	9,25 +/- 0,96
Improve practical knowledge	9,40 +/- 1,00	9,63 +/- 0,74	9,00 +/- 1,41
Stress reduction	9,30 +/- 0,90	9,38 +/- 0,92	9,25 +/- 0,96
Utility at theoretical level	9,30 +/- 1,60	8,88 +/- 1,89	10,00 +/- 0,00
Utility at a practical level	9,70 +/- 0,90	9,50 +/- 1,07	10,00 +/- 0,00
Mandatory for students	9,90 +/- 0,30	9,88 +/- 0,35	10,00 +/- 0,00

Finally, it is noteworthy that 75% of the participants expressed curiosity about the workshop and provided positive feedback afterward, including comments such as:

- "I felt happier and more eager to learn. I thought it would be important for students to always receive this training. Thank you very much, Idiwaka team."
- "The experience was the best because of the skills gained. Very good."
- "I enjoyed the training and gained enough knowledge about postpartum hemorrhage. I gained more experience in blood loss prevention."
- "It helps to save mothers' lives."
- "It will improve their skills and knowledge."
- "I did not know how to perform the Lynch maneuver or how to apply the balloon for hemorrhage, but I can do it perfectly now. Thank you very much for the training."

As with the previous workshop, we divided the participants into two groups: on one hand, those who routinely manage postpartum hemorrhage in their daily practice (physicians and midwives), and on the other hand, those who do not, but who may potentially need to manage such cases in the future (nurses and medical students).

In the first group, consisting of 6 midwives and 2 physicians, we obtained positive and statistically significant results in most of the evaluated parameters (Table 7). Four parameters did not show statistical significance.

Table 7: Analysis of the Difference Obtained in the Pre- and Post-Workshop Surveys on Postpartum Haemorrhage in Relation to the Questions on the Degree of Confidence and Security in the Subgroup of Midwives and Doctors (N=8)

	Pre-W	Post-W	Difference	p-value
Theroetical skills of BLQ	7,13 +/- 2,10	8,38 +/- 1,06	1,25	0,014
Basic concepts of BLQ	6,63 +/- 1,77	8,38 +/- 1,06	1,75	0,0004
Practical skills of BLQ	7,75 +/- 1,04	8,88 +/- 0,64	1,13	0,001
Assisting a bleeding	8,00 +/- 1,31	8,75 +/- 1,58	1,75	0,024
Bleeding control	8,25 +/- 0,89	8,63 +/- 1,51	0,38	0,238
Control the situation at first	8,13 +/- 1,13	8,25 +/- 1,39	0,13	0,299

Subjective quantification	7,13 +/- 1,64	8,38 +/- 1,30	1,25	0,009
Objective quantification	6,38 +/- 1,51	8,25 +/- 1,75	1,88	0,001
Difference mild/severe blood loss	7,50 +/- 2,39	8,63 +/- 1,06	1,13	0,081
Coordination	9,00 +/- 0,76	9,25 +/- 1,04	1,25	0,282
Prevention	7,63 +/- 1,19	8,88 +/- 0,99	1,25	0,001
Assist with an obstetrician	6,63 +/- 2,92	8,50 +/- 1,60	2,2	0,002
Assist alone	6,88 +/- 2,10	8,00 +/- 1,51	1,7	0,001

Two of these parameters are consistent with previous analyses: "How would you assess your safety in managing postpartum blood loss?" (0.38 points, p = 0.238) and "How would you assess your safety in coordinating with other professionals present?" (1.25 points, p = 0.282). These questions are quite broad and do not evaluate specific technical aspects, particularly regarding coordination among professionals, which is not sufficiently addressed in these workshops.

The initial situation management also did not show significant differences (0.13 points, p = 0.299), likely because participants already had a high baseline score, as these are professionals who routinely deal with such situations, leaving little room for improvement.

Lastly, the question "How would you assess your safety in differentiating between mild and severe blood loss?" did not achieve statistical significance by a small margin, suggesting that a larger population may be needed to demonstrate this effect (1.13 points, p = 0.081).

The most reinforced aspects were the ability to perform objective blood loss quantification (1.88 points, p = 0.001), as this is a new technique introduced at this center for the first time through these workshops, and confidence in managing postpartum hemorrhage in the presence of an obstetric specialist (2.2 points, p = 0.002). Other aspects that showed improvement included managing postpartum hemorrhage without supervision (1.7 points, p = 0.001) and the knowledge of basic concepts of postpartum hemorrhage (1.75 points, p = 0.0004), which underscores the improvement in safety within clinical practice.

Evaluating the utility of the workshop in the post-workshop survey for this subgroup, the highest-rated aspects were whether the workshop was generally useful (9.75 ± 0.46); whether it improved their practical knowledge (9.63 ± 0.74); and whether the workshop should be mandatory for medical or midwifery students (9.88 ± 0.35).

In the second group, composed of 3 nurses and 1 medical student, most of the results were not statistically significant, which may be due to the small sample size and wide variability in responses, with very high standard deviations (Table 8).

Table 8: Analysis of the Difference Obtained in the Pre- and Post-Workshop Surveys on Postpartum Hemorrhage in Relation to the Questions About the Degree of Confidence and Security in the Subgroup of Nurses and Medical Students (N=4)

	Pre-W	Post-W	Difference	p-value
Theroetical skills of BLQ	7,00 +/- 2,16	7,50 +/- 0,58	0,50	0,3
Basic concepts of BLQ	6,25 +/- 1,50	7,75 +/- 0,96	1,50	0,09
Practical skills of BLQ	6,50 +/- 2,52	8,00 +/- 1,83	1,50	0,12
Assisting a bleeding	7,00 +/- 2,16	9,00 +/- 1,15	2,00	0,06
Bleeding control	6,75 +/- 2,36	8,25 +/- 1,50	1,50	0,17
Control the situation at first	6,00 +/- 2,16	8,25 +/- 1,71	2,25	0,02
Subjective quantification	6,50 +/- 1,73	7,75 +/- 1,5	1,25	0,07
Objective quantification	5,25 +/- 3,40	7,50 +/- 2,08	2,25	0,14
Difference mild/severe blood loss	7,50 +/- 2,38	8,50 +/- 1,73	1,00	0,21
Coordination	6,50 +/- 2,38	7,50 +/- 1,00	1,00	0,21
Prevention	6,50 +/- 2,52	8,50 +/- 1,91	2,00	0,046
Assist with an obstetrician	6,00 +/- 2,71	8,75 +/- 1,50	2,75	0,02
Assist alone	5,50 +/- 1,00	8,25 +/- 1,71	2,75	0,04

Among the statistically significant parameters, the initial situation management (2.25 points, p = 0.02) stands out, which is particularly interesting since this parameter did not improve for those accustomed to dealing with these situations but was one of the most important areas of improvement in this subgroup. Additionally, the prevention of postpartum hemorrhage (2.00 points, p = 0.046) and managing postpartum hemorrhage both with the supervision of a specialist (2.75 points, p = 0.02) and without it (2.75 points, p = 0.04) were significantly improved, highlighting once again the enhancement of safety in clinical practice.

Evaluating the utility of the workshop in the post-workshop survey for this subgroup, the highest-rated aspects were whether the theoretical (10.00 ± 0.00) and practical (10.00 ± 0.00) com-

ponents were necessary, and whether the workshop should be mandatory for medical or midwifery students (10.00 ± 0.00).

Conclusions

According to the results obtained from the surveys regarding the acquisition of theoretical and practical knowledge, it is worth noting that, starting from a high pre-workshop average score in both workshops (7.63 in the childbirth workshop and 7.11 in the postpartum hemorrhage workshop), this score significantly increased by more than one point in both cases (8.94 in the childbirth workshop and 8.4 in the postpartum hemorrhage workshop).

This study highlights the potential of virtual clinical simulations as an effective teaching method and as a short- and long-term aid in international cooperation campaigns. In these campaigns, healthcare professionals can perfect their skills in a safe environment without the risk of harming real patients. They can repeat techniques until they master them, making mistakes, learning from them, and trying again.

Therefore, these simulation workshops should be included in future international cooperation campaigns. This way, healthcare workers in those countries will acquire clinical, theoretical, and technical skills that can enhance the quality of healthcare provided in their respective geographical areas. This training is particularly relevant in specialties such as gynecology and obstetrics.

Some limitations of the study include the small number of trained healthcare professionals, which is due to the fact that this project was carried out for the first time at a Health Center IV hospital in Uganda. Ugandan health facilities are classified into seven levels based on the services they provide and the geographic area they serve, ranging from Health Center Level I (HC I) to Health Center Level IV (HC IV), followed by General Hospitals, Regional Referral Hospitals, and National Referral Hospitals.6 The Health Center IV where this study took place has a limited staff of 6 midwives, 4 nurses, 2 laboratory technicians, and 2 general physicians. Additionally, this study focused on the short-term acquisition of skills, making it necessary to assess whether these competencies are retained over the long term. For this purpose, follow-up surveys are planned 12 months after the training (April 2025).

Strengths of the study include the fact that our center has already published several similar studies on how workshops influence the training of medical students, residents, and even senior staff. Therefore, transferring this project to an international cooperation framework is a feasible objective with the necessary foundations to carry it out. Furthermore, it is important to highlight the excellent response from the healthcare professionals who participated in the workshops throughout the study period.

Finally, these healthcare professionals perceived the simulation-based workshop as useful and necessary. We believe that exploring factors like these is crucial in determining the impact of such interventions in the context of international development cooperation.

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