

Enhancing Interprofessional Education: Insights from Students at the College of Medicine and Health Sciences at the University of Rwanda

Philomene Uwimana^{1*}, Assumpta Yamuragiye², Providence M. Umuziga¹, Fiston Gatera Kitema², Richard Nduwayezu³, Yvonne Delphine Nsaba Uwera¹, Christine Ufashingabire², Patricia Mujawimana¹, Jean Baptiste Sagahutu², Jeanne Kagwiza²

¹School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda

²School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda

³School of Medicine and Pharmacy, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda

***Corresponding author:** Philomene Uwimana. School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda. Email: p.uwimana1@ur.ac.rw. ORCID: <https://orcid.org/0000-0003-3198-1852>

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Abstract

Background

Interprofessional education (IPE) is essential for preparing healthcare students to work collaboratively. However, embedding IPE in a traditionally siloed educational framework can be a challenging process as its integration requires a shift in teaching strategies and creation of collaborative learning environments, allowing practical and meaningful interactions between students.

Purpose

The study explored the experiences and perceptions of students regarding the implementation and effectiveness of IPE at the University of Rwanda, College of Medicine and Health Sciences.

Methods

We used qualitative descriptive exploratory design. Data were collected through focus group discussions among 31 students. Thematic analysis was conducted on the transcripts from students' narratives, organized using NVIVO version 15.

Results

Four overarching themes emerged from the analysis: (1) experiences of IPE in clinical settings, (2) perceived benefits of IPE, (3) structural challenges to implement IPE at UR-CMHS, and (4) proposed strategies to enhance IPE at UR-CMHS.

Conclusion

IPE has the potential to enhance communication, reduce medical errors, and improve patient care. However, barriers such as hierarchies, workload issues, and lack of shared training hinder its effectiveness. Implementing institutional support and a dedicated IPE module at the CMHS-UR could foster a collaborative learning environment and better prepare graduates for team-based healthcare.

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Keywords: Interprofessional education (IPE), Interprofessional collaboration (IPC), healthcare students, students, team-based healthcare, care, Rwanda

Background

The need for healthcare professionals working collaboratively in diverse teams is increasing with the rapid advancement in medical and healthcare practices. Interprofessional Education (IPE) is one of the strategies to prepare future health care professionals ready for collaborative practice to improve interprofessional collaboration (IPC).[1]

IPC refers to the collaboration among professionals from different disciplines working together with the common goal of improving patient outcomes and healthcare delivery. Key attributes of interprofessional practice include effective communication, shared decision-making, mutual respect, role clarity, and collaborative problem solving.[2] These elements form the foundation of both interprofessional education (IPE) and interprofessional collaborative practice (IPC), which are essential for high-functioning healthcare teams.

IPC is associated with various benefits to patients, community, professionals and health care organizations. For patients, studies have reported better acceptance of care, fewer clinical visits, higher degrees of satisfaction, and improved health outcomes.[3] Other benefits include reduced medication errors, improved communication, reduced mortality rate, and reduced length of stay and related costs.[4] For health workers, working with a supportive team, sharing problems, and enhancing communication lead to greater role clarity, improved satisfaction, motivation, and reduced staff turnover.[4,5]

In addition, collaborative practice can reduce the risk of duplication in care provision, improve continuity and coordination of care, and the quality of healthcare services. Interprofessional Education (IPE) is defined by Dobbs-Oates and Morris in 2016 as a collaborative learning approach in which students from different healthcare disciplines engage in shared educational experiences

to enhance teamwork, communication, and patient-centered care.[6]

According to the same authors, IPE seeks to bridge gaps between various healthcare professions by fostering an environment where students from multiple disciplines can develop skills in collaboration, mutual respect, and effective communication. These skills are essential in ensuring high-quality care delivery in today's healthcare systems, where healthcare teams often consist of professionals from varied backgrounds and roles.[6]

Literature on IPE distinguishes two levels of implementation that include pre-licensure education and post-licensure competency enhancement. For instance previous researchers suggested that IPE should be initiated early in health professional basic education to enable future healthcare professionals to graduate with IPC competencies.[7] The authors further stated that IPE is essential to prepare students to enter the health workforce with teamwork and collaboration competencies, which are crucial for their practice.[7]

While continued professional development at the post-licensure level targets people already in practice and actively dealing with patients on a daily basis, research suggests beginning at the pre-licensure level has the advantage of preparing future clinicians to shape their practice early in their career.[8] While the World Health Organization (WHO) recommends 5.9 health professionals per 1000 people, Rwanda Ministry of Health (MoH) key indicators identified that in the country there is 1 nurse per 1,094 inhabitants, 1 medical doctor per 10,055 inhabitants, 1 pharmacist per 16,871 inhabitants and 1 laboratory technician per 10,500 inhabitants.[9] This statistic is of concern given the high burden of preventable and non-communicable diseases in the region.[10] It is believed that IPE approach to train healthcare professionals with collaborative practice competencies would contribute to address the concerns related

to the shortage of healthcare professionals in Rwanda and respond to the need for quality healthcare services delivery in the country.

The College of Medicine and Health Sciences (CMHS) is one of the six colleges that constitute the University of Rwanda. UR-CMHS consists of five schools: Medicine and Pharmacy, Public Health, Health Sciences, Nursing and Midwifery, and Dentistry. It trains a wide range of healthcare professionals including medical doctors, nurses, midwives, dental surgeons, dental therapists, and other allied professionals at undergraduate (Advanced Diploma, Bachelor's) and postgraduate (Certificate, Mater's, PhD) levels. Graduates are expected to collaborate across disciplines to improve health outcomes for patients/ clients, and communities. The CMHS is committed to producing healthcare professionals who are knowledgeable and capable of working effectively within multidisciplinary teams. Hence, during clinical placements, students should be exposed to IPE because the clinical settings naturally bring together learners from different health professions who engage in shared patient care, creating opportunities for collaborative learning and teamwork. Despite this commitment, there is a need to explore the practical integration of IPE within the curriculum. Understanding how students perceive, and experience IPE will provide valuable insights into its effectiveness and potential challenges in the context of the University. Students, as the recipients of IPE, are directly impacted by how it is delivered and experienced within the educational setting.

However, embedding IPE in a traditionally siloed educational framework can be a challenging process. While various educational institutions globally have recognized the importance of IPE,[5] many face barriers such as resource constraints, curricular rigidity, and resistance from both faculty and students. Additionally, the integration of IPE requires a shift in teaching strategies and the creation of collaborative

learning environments that allow for practical and meaningful interactions between students from different disciplines. [11]

Few studies have explored IPE in the context of Rwanda. For instance, a study conducted to identify whether training using international classification of functioning disability framework can increase knowledge and attitude regarding IPC, has strengthened the need for IPE.[12] Furthermore, a study on interprofessional collaboration experience in obstetric and neonatal care has also identified a need to organize continuous IPE sessions to train future healthcare providers who would be ready for collaborative practice after their studies.[13] However, a systematic review conducted to explore IPE in sub-Saharan regions where Rwanda is located revealed a scarcity of literature on the topic in this particular region indicating a need for more research to assess the status of IPE and develop initiatives that promote collaborative learning among students to improve IPC in practice.[14]

The present study, therefore, sought to explore the experiences and perceptions of students regarding the implementation and effectiveness of IPE at the University and College of Medicine and Health Sciences. By understanding the challenges, benefits, and overall impact of IPE from the students' perspectives, this study aims to offer recommendations on how best to embed IPE into the curriculum. Furthermore, it explored how such integration can be sustained, scaled, and adapted to fit the evolving needs of healthcare education. The findings of this study are expected to contribute to the development of strategies for enhancing IPE and promoting collaborative learning within medical and health sciences education.

Methods

Study Setting and Design

This study was conducted at the study setting is the College of Medicine and Health Sciences of the University of Rwanda,

the only public university in Rwanda. The UR/CMHS has five schools and many departments that train medical doctors, nurses and midwives, dental surgeons and dental therapists, and other allied healthcare professionals. The CMHS operates on three campuses namely Remera in Kigali city, Rwamagana in the Eastern Province, and Huye in the Southern Province. At the UR/CMHS, teaching and learning activities take place in classroom settings, in simulation environments, community and in real-world clinical settings.

A qualitative descriptive exploratory design was used in the study to explore and describe the experiences and perceptions of students about IPECP at UR-CMHS. Using a descriptive qualitative approach was found important and relevant for researchers who seek to describe experiences and perceptions of participants regarding a phenomenon not very well understood.[15,16]

Study participants

Study participants were undergraduate students selected purposively based on criterion sampling for being student in the department of primary health care in medicine, general nursing, human nutrition and dietetics, anesthesia, midwifery, mental health nursing, occupational therapy, physiotherapy or dentistry, and consenting to participate in the study. Consideration was given to the year of study in the program, for both pre- and final year students. This is because students in these years of training would have a good understanding of their profession and would have been placed for a longer period at clinical sites for the clinical learning. The recruitment of the students to participate in the study was done via WhatsApp messages sent to their respective class groups with a follow up with the class representative by the faculty identified and trained as IPE champion in the department. Students interested in participating in the study were approached for further arrangements regarding their preferred location and time for the interviews. A total of 31 students participated in 4 focus group discussions (8 from primary health care,

6 from general nursing, 7 from midwifery, and 10 from mental health nursing) provided their consent to participate in the study and constituted the final sample size for the FGDs. Considering what the literature indicates, [17] the sample size of the FGDs was sufficient for the study.

Data collection process

A semi-structured interview guide was used to support the collection of relevant information from participants.[18]The interview guide was designed to directly address the objectives of the study, based on a review of relevant IPE literature. It explored students' perceptions on and experiences with IPE activities during their training. Questions examined both enablers and barriers, while also assessing the impact of IPE on teamwork, communication, and readiness for collaborative practice. In addition, participants were invited to suggest strategies for enhancing IPE integration at UR-CMHS. The interview guide was developed in English by the research team, translated to Kinyarwanda with the assistance of a professional translator, and then for authenticity of the meaning and content of the items vis-à-vis their originality. Although English is the medium language of instruction at UR, to ensure that students understand well the topic of discussions and can freely provide their insights without any barriers, focus groups were conducted either in English or Kinyarwanda depending on the choice of the participant(s). Four focus group discussions (FGDs) were conducted with the pre and final year students to inquire separately for each department about their experiences and perceptions regarding IPE, and to suggest strategies for IPE enhancement at UR/CMHS. The number of four FGDs was deemed sufficient to enable data saturation, cognizant that the literature reports that two to three focus groups can lead to discovering more than 80% of themes.[9] The FGDs were conducted in quiet private rooms at CMHS Remera campus for two FGDs or at clinical placement settings, depending on students' location at the time of data collection.

The length of each FGD ranged between 39 to 100 minutes.

Participants were provided with the opportunity to discuss any additional perspectives related to the enhancement of IPE at UR/CMHS during the FGDs, also, toward the end of the FGDs, the researcher did a recap of the main points discussed during the session for clarifications and corrections, where deemed necessary. Data collection was done in November and December 2024.

Data Analysis

Transcribing audio-recorded data was done verbatim, and the transcripts were analyzed using thematic analysis steps as described in previous research.[19,20] The accuracy and completeness of the transcribed data were checked by reading many times the transcripts while listening carefully to the audio-records of the data. We used NVivo version 15 Pro,[21] to organize and manage the data. The research team read and re-read the transcripts to familiarize themselves with the content before engaging in the coding process, which was interactive, using the line-by-line technique to create initial codes. These codes were then grouped into broader and meaningful segments through inductive analytic approach, which facilitated the development of overarching themes.[20]

Validity and Rigor of the study

To ensure the validity and rigor of the study, researchers followed the principles of trustworthiness that include credibility, confirmability, dependability, and transferability.[22] Credibility was ensured by recruiting only eligible study participants, preserving anonymity and confidentiality during data collection and storage, verifying transcripts accuracy, and having experienced qualitative researchers review the generated themes. Additionally, providing a description of the study setting, inclusion criteria, sampling, data collection process, and analysis supported the dependability and transferability of the findings.

Ethical considerations

The clearance to conduct the study was sought from the Institutional Review Board of the College of Medicine and Health Sciences at the University of Rwanda (No.483/CMHS IRB/2023). In addition, the management of CMHS provided written permission to collect data. All study participants gave written informed consent prior to starting data collection. All participants consented to audio-recording of their responses, while anonymity was preserved with the use of codes with numbers.

Results

Participants demographics

Student participants consisted of 18 males and 13 females with an average age of 24 years (range of 19 to 46 years). Most of them were pre-final year students (23), while the remainder were I their final year of training programist students (8).

Experiences, Perceptions, and Strategies to advance IPE at UR-CMHS

To respond to the objective of the study aimed at exploring the experiences of students about IPE and their perceptions on how to embed IPE in UR-CMHS, the analysis of the transcribed data from the FDGs with student participants yielded four main themes: (1) experiences of Interprofessional Education (IPE) in clinical settings, (2) perceived benefits of IPE, (3) structural challenges to implement IPE at UR-CMHS, and (4) proposed strategies to enhance IPE at UR-CMHS.

To ensure anonymity and confidentiality of the study participants to report the findings, codes and pseudonyms were used. Hence, **MS** stands for medical student (1,2,3,...); **NS**: nursing student, **MDWS**: midwifery student, and **MHNS**: mental health nursing student.

Experiences of Interprofessional Education (IPE) in the clinical setting

The findings revealed that there is variability in exposure to IPE during clinical rotations.

Some students have had the opportunity to be involved in or witnessed a session of IPE at clinical sites. A year four medical student shared his experience as follows:

“During our six-months of clinical rotations in third year, in different units, we closely interacted with clinical medicine and nursing students, sharing the same felicitators, and had the same responsibilities to patients regardless of student particular department or program. There were no strict topic restrictions during the afternoons’ teaching sessions, allowing all students to learn broadly. The approach helped us acquiring the same up-to-date knowledge from the same senior doctors, which I believe was very beneficial.” (MS1)

Another medical student pointed out occurrence of collaborative learning with students from different health disciplines, she stated:

“From the experience I got during my clerkship last year, we were with the clinical medicine staff (clinical officers), with the students from biomedical laboratory sciences (BLS), and we often participated together in the afternoon sessions where we discussed common cases from the hospital. Everyone was encouraged to share their perspectives and contribute to the discussions, creating a collaborative learning environment.” (MS2)

Similarly, a year 3 nurse students reported:

“I am a third-year nursing student, and I haven’t had much clinical experience yet, but during our current placement, I have observed that during staff meetings on Mondays and Fridays, doctors, nurses, and staff from other disciplines e.g. nutritionist, all contribute with their respective perspectives. I believe teamwork is what truly matters, and I learnt from that...” (NS1)

However, other students reported not having been exposed to IPE, the training was in silos for each discipline, they reported isolated learning experiences in some hospital settings.

Probably because of limited awareness or training about IPE among clinical educators or may be due to a weak coordination between academic and clinical teams. For instance, one medical student who did his/her clerkship in different clinical setting mentioned that:

“Where I did my clerkship, it was not like that. Just if there are medical students, they had their own program and nursing students had their program, so we did not have that experience learning together with other students from different disciplines” (MS3)

Another medical student echoed about not even knowing the other professional was doing/ learning at the hospital. S/he expressed as follows:

“Speaking from experience, when I started my clerkship I met clinical medicine students, and I asked what do the clinical medicine students do, because I did not know their role compared to mine as general medicine student. I even wondered if the hospital has a clinical medicine staff. It was concerning that I didn’t have enough information about their responsibilities or how they could intervene in certain situation.” (MS4)

The variability of IPE exposure among UR-CMHS students can probably be explained by the differences in clinical placement sites where students rotated, where some of them got the chance to be placed IPE could be well understood and IPC implemented, compared to other clinical sites where their fellow students rotated.

Perceived benefits of IPE

In this study, student participants felt that IPE could improve teamwork and communications skills. It was mentioned that it could also lead to the better understanding of roles and responsibilities, fostering the collaboration among healthcare professionals, enhanced patient-centered care, minimized medical errors and improved patient quality of life.

Furthermore, students mentioned that IPE could help reduce professional hierarchies and promote mutual respect in healthcare providers. A couple of students discussed exposure to early interdisciplinary learning:

“...so, involving others to learn from other professionals or other faculties like learning together may improve medical care, improve teamwork spirit and collaboration. We know that when people work together it gives good outcomes and may reduce a lot of medical errors comparing to what can be done by one health professional alone e.g. a medical doctor or other professional; we work together to correct those errors, and it will improve quality of life.” (MS2),

“I think that IPE for students from different professions could be a good thing because all we aim at is improving the patients centered care and bringing the good outcome out of our patients care. So, when integrates different students from different careers I think it would be of great value because we have different goals of treatment as one person, hence it could foster the teamwork spirit and sharing the same goal which is providing good care to the patient and even, it could give a platform for students to discuss different cases which are crosscutting within our professions. (MS4)

Another student reiterated by maintaining that IPE could help to learn what the other health professional knows for the benefit of the patient they all care for. Students shared:

“I think IPE can help all different departments of health sciences to learn what they need to know most and what they need others, their colleagues to know because they all come in to treat the same patient, to fix the same issue. I think it's good to know every one's responsibility and rights and boundaries, and what can be their intervention.” (MS5)

“Understanding the roles of different disciplines in the medical field is important for students. When students learn together,

they become aware of each other's responsibilities, which helps them to know when and how to respond in specific situations. For instance, if you are diagnosing a patient with schizophrenia, it's important to know that a mental health professional can assist. So, without this understanding, proper management can be compromised, but when students collaborate and understand each other's roles, they can intervene more effectively and provide better care.” (NS2)

On the other hand, a student mentioned that IPE helps break down professional hierarchies and fosters mutual respect among healthcare professionals. S/he stated that:

“This helps in build unity among health professions from the beginning. In the past, nurses and midwives considered doctors as superiors and felt unable to speak up, even if they were wrong no one dared to challenge them. If students from different programs trained together, they would better understand each other's roles and focus on their shared goal—quality patient care, despite difference in qualifications. This kind of exposure also fosters better teamwork later on, even among those from different specialties, like doctors, midwifery, ophthalmology, psychiatric, etc. who may end up working together without prior interaction.” (MDWS1);

Another one echoed her colleague, saying:

“What I can add to what my colleagues said is that, if someone is a gynecologist and I am a midwife, we should get some training together. This will foster the collaboration later but also the mutual respect and understanding of each other's scope of practice.” (MDWS2)

Structural challenges to implement IPE at UR-CMHS

The findings indicated that the difference in programs structure; heavy academic workload limiting time for additional learning; a lack shared training results in gaps in knowledge about other professions' contributions to patient care;

lack of structured guidance before and mentorship during clinical learning involving the other health profession students; and differences in professional hierarchies and perceived inequities in healthcare could impede of the implementation of IPE at UR-CMHS. For instance, two students recalled:

“We have different schedules to implement curricula for different programs, you see some do three-year program, others four-year, others five-year, so we have different programs, it is somehow tricky to bring all of them together because some join the hospitals when they are in year one and others we wait for three years.” (MS3),

also the way UR-CMHS operates on three campuses is another challenge raised by students. One of them said:

“Students are identified according to campuses, you see there’s not that bond among us students, (we are from different campuses even if we are studying the same program, and how can this be done, I mean that IPE?” (NS3)

Another participant stated that their schedule is already overloaded with the specific learning, hence no time for bringing together all the students for IPE. The participant said:

“I think we lack time to learn about the roles of other professions, I understand that if we have to learn together we are not only going to learn the roles of the nurses, anesthetists, we will go further to the role of nutritionists, pharmacists, and I think it could be better if we just remain focused and familiarize with what we have to do. I understand it’s a good thing, but we don’t have time.” (MS6)

A student raised a challenge related to not being guided through effective communication and mentored at a clinical site that originates from the department/school not collaborating with other disciplines:

“... for example, for those who we attend the clinical placement at the first time they

face many challenges due to the fact they don’t receive sufficient information about clinical setting they will attend, they only benefit nearly half of the period of the clinical placement while the rest of the time they struggle navigating through the strange environment.” (NS4)

“Another issue is the lack of collaboration and inequality among the workers in clinical settings. Students often don’t receive proper guidance or see good examples of teamwork, as even doctors and nurses sometimes fail to collaborate. While both have the same goal towards patients they care, they roles are valued differently. Nurses are overlooked and underappreciated compared to medical doctors. This unequal treatment extends to students during clinical placements, who then internalize and carry these disparities with them.” (NS5)

The findings revealed gaps in mentorship, communication, and IPC during students’ clinical placements. Limited guidance and unequal treatment among healthcare professionals not only hinder students’ learning experiences but also risk reinforcing professional hierarchies and poor teamwork, ultimately impacting the quality of patient care and future of collaborative practice.

Proposed strategies to enhance IPE at UR-CMHS

This theme describes a variety of strategies to enhance IPE at UR-CMHS as identified by the student participants. The proposed strategies include introducing a dedicated IPE module in the curriculum; organizing interdisciplinary workshops, case discussions, and clinical simulations; encouraging social and academic interaction among students from different departments; and integrating shared modules across health disciplines to reduce redundancy and improve efficiency. Furthermore, the findings indicated that there should be institutional support through commitment to implementing IPE policies, handling financial and logistical constraints in

harmonizing programs across UR-CMHS campuses, and providing structured mentorship and supervision during clinical practice to ensure students are actively learning.

A couple of students proposed the development of a module on IPE that could be taught as a pre-clinical blocked period:

“...the University of Rwanda could implement a simple module where students from different schools or faculties learn together. This module could focus on understanding the roles and objectives of various health professionals such nurses, doctors, anesthetics, midwives, and others, from different aspects ...” (NS3);

“I think that module can be taught or delivered to the students at the time of need, for example I am preparing to join the clinic I am in year three then the module should be introduced to me. If someone is in year one term one preparing herself to join the clinical placements, then s/he should learn the module and when they get in the hospital, UR put that on the learning objectives.” (MS4)

Another student echoed:

“I think that also should be scheduled at the calendar by the university and be shared to the hospital and those who are in charge at the hospital should also try fulfill their responsibility if it's important that their responsibility to teach those who are in hospital especially students those who are going to join their career as professionals.” (MS1)

Several students have suggested that IPE should first be initiated at the school during classroom teaching before being expanded to clinical teaching. They stated as follows:

“It (IPE) should be rooted at the campus first and then at the clinical site, otherwise I think it's impossible to achieve that only at the clinical site while it is not met at the campus.” (MS5)

“I think that during that induction period we can have IPE sessions, two or three discussing the roles of each professional

so that all of us have a shared view about what is done in our settings”. (MS3)

“...and once the students are at clinical settings, staff should implement IPE by bringing all students together to teach the values of teamwork, collaboration, professional roles, responsibilities, and boundaries.” (NS7)

Further suggestions were made on how to proceed with the implementation of IPE at CMHS, including initiating IPE clubs, and conducting workshops or seminars on IPE before students go in clinical placements. The students mentioned:

“Make a club of IPE as a trial and check if it can be successful. Students can be divided into smaller, mixed groups – each including students from different programs like medicine, anesthesia, midwifery, and others. Each group can be assigned specific tasks, such as exploring the roles and objectives of nurses or other professionals in the hospital. And then share their findings and learn from each other's perspectives.” (NS3)

“It can be kind of workshops, seminars, and exhibitions especially here at the campus. I think they can learn much about different professions of student's; that kind of approach is very interactive and informative because now students are studying by observing.” (MS4)

A student suggested conducting seminars through students' associations such as nurse and midwife students' association of Rwanda (NMSAR) and medical students' association of Rwanda (MEDSAR) on IPE for students who would have completed their clerkship, on completion of studies and having the experience from the clinical world. S/he said:

“... the other strategy is after studying, using those heading associations MEDSAR and the one for nurses NMSAR, after coming from experience from clerkship and from theories we did during those three years or four years or five years.

It can be built on how you have seen the team working, where there is a gap to be fulfilled.” (MS3)

The students mentioned that to successfully implement IPE at UR-CMHS, there should be CMHS structural changes including but not limited to:

“First of all, to have one campus for CMHS, all the students to be at the same place helps to build that strong bond. To bring the students to feel they belong to the same college, not to be identified by campuses” (NS8)

“For me, a lot can be done for students to graduate with a clear understanding of their roles within collaborative teams. Students need structured support through teaching, but mainly through mentorship, and proper supervision. UR should strengthen the training approaches, and greater emphasis to be placed on ethics and professionalism among teams of care to uphold standards in different disciplines of healthcare.” (MDWS4)

Discussion

Experiences of IPE in the clinical setting

The study findings reveal variation in students' exposure to interprofessional education during clinical rotations at UR-CMHS. This heterogeneity of experiences mirrors what is commonly observed in IPE implementation globally, where interprofessional learning opportunities often lack consistency across different clinical environments. [4] While some students reported valuable collaborative learning with peers from different health disciplines, others described learning that occurred strictly within professional silos, a dichotomy that highlights both opportunities and missed chances for interprofessional socialization.

The collaborative experiences described by some students such as joint case presentations, shared teaching sessions, and integrated clinical responsibilities,

align with what Thistlethwaite and colleagues identified as authentic interprofessional learning experiences.[23] These activities engage students in meaningful collaboration rather than merely co-locating them in the same clinical space. As one medical student noted, they "had the same facilitators... had the same tasks" regardless of program, creating genuine shared learning. Such experiences represent what D'Amour and Oandasan (2005) term "interprofessionality" which is the development of cohesive practice among different professionals through the cultivation of integrated knowledge and skills.[24] Nonetheless, a study conducted in United States aiming to develop faculty capacity to effectively facilitate IPE, reported that participating in IPE activities provide valuable opportunities to apply collaborative skills, yet required clear roles definition, proper pre-debriefing, and pairing with their peers.[25] Hence, IPE is more than students from different disciplines being supported by the same facilitator or performing similar tasks. It is likely that students who shared their IPE experiences in our study had a limited understanding of what translates effective IPE.

However, the experiences of isolated learning reported by other students represent missed opportunities for interprofessional socialization. According to Khalili et al. (2013), early professional socialization often occurs in discipline-specific silos, reinforcing professional boundaries and stereotypes.[26] The statement from one medical student who was unaware of clinical medicine students' roles reflects what Baker et al. (2011) describe as "professional tribalism", the tendency of professions to develop distinct identities that can hinder collaboration.[27] This knowledge gap illustrates how the absence of structured IPE can drive role ambiguity and affect future collaborative practice. The inconsistent implementation of IPE across different clinical sites at UR-CMHS reflects what Paradis and Whitehead (2015) identify as a common challenge,

IPE often depends on local champions, institutional culture, and resource availability.[28] Without systematic implementation, interprofessional learning becomes dependent on circumstance rather than design. This creates inequities in students' preparation for collaborative practice, which can affect the development of collaborative competencies among graduates.

Faculty role modeling emerges as an important factor in these clinical IPE experiences. Students who observed collaborative practice during staff meetings where "doctors, nurses, and other healthcare professionals share ideas were exposed to what Lave and Wenger (1991) describe as "legitimate peripheral participation, in other words learning through observation of authentic professional interactions. [29] Students who witnessed hierarchical or segregated practice may absorb these models as normative, potentially affecting their future collaborative behaviors. This finding underscores the importance of what Steinert (2005) terms the "hidden curriculum" in clinical settings, the implicit messages conveyed through organizational structures and interprofessional dynamics. [9]

The variability in IPE experiences at UR-CMHS reflects a broader challenge identified the translation of IPE principles from theory to practice remains inconsistent in many educational contexts.[10] This gap on IPE implementation suggests a need for more systematic approaches to embedding interprofessional learning opportunities throughout health professions education at the institution collaboratively with the clinical settings.

Perceived benefits of IPE

Students in this study identified several key benefits of IPE, with improved communication being the most frequently mentioned. Effective communication in healthcare settings is very important, and the ability to communicate effectively across the healthcare team leads to better

coordination of care and improvement in patient safety and better outcomes. This aligns with the growing evidence that IPE contributes to improvement in interprofessional collaboration, leading to better healthcare delivery, reduced errors, and improved patient outcomes.[30]

Additionally, the findings in this study indicated that IPE helps students to learn from their fellow students in the other professions, which concur with the results of a previous study that sought to evaluate the impact of an IPE activity on student participants' attitudes and perceptions across five academic programs. The study revealed that the students found IPE "as eye opening, positive, and beneficial", reporting that "where you are weak, they are strong". [31] Furthermore, congruent to the findings of this study, found that students gain a clearer understanding of their own roles, appreciation of the others' contributions, and recognition of the importance of collaboration by reducing hierarchy in achieving the shared goal of delivering optimal patient care.[32]

Structural challenges

Despite the recognized benefits of IPE, students identified several challenges that hinder the effective implementation of IPE at the UR. CMHS. One of the most significant barriers was the existing differences in professional hierarchies among healthcare students. The growing literature on IPE identified that in many healthcare settings, traditional hierarchies place certain professions, such as physicians, at the top, which can create an environment where other professionals feel undervalued.[33–35] Additionally, students mentioned a lack of integration of IPE in education curricula and heavy workload as barriers to implementing IPE. This lack of shared educational experiences can lead to misunderstandings and missed opportunities for effective teamwork when students enter professional practice.[30]

Proposed strategies to enhance IPE at UR-CMHS

To address the challenges and enhance the integration of IPE, students proposed several practical strategies including the introduction of a dedicated IPE module in the curriculum and institutional support. According to students who participated in the study, by embedding IPE into the formal educational structure, students from various disciplines could be given structured opportunities to engage with one another, fostering collaborative learning and breaking down professional silos. A dedicated module would not only ensure that all students receive consistent exposure to interprofessional principles but also allow for the development of practical skills that could be directly applied in healthcare settings. The findings from this study related to proposed strategies to enhance IPE echo what many other previous studies on IPE have identified. For instance, in the study about health students' perceptions about IPE and the potential barriers highlighted the strong need to integrate IPE in education curricula to enhance IPE.[35]

The findings from this study showed that the strategies proposed by students to enhance IPE were mainly focused on the introduction of an IPE module into the existing curriculum. Studies have shown that there is a need to incorporate IPE courses into health sciences programs [36] and revealed a significant difference in competence and autonomy, where senior students scored higher compared to junior students.[37] Hence, early exposure to IPE in pre-professional years is crucial to preparing future health professionals.

Furthermore, students suggested interdisciplinary workshops, clinical simulations on IPE, and encouraging social and academic interaction among students. Similar findings have reported that interprofessional simulations increased students' trust and positive attitudes toward other student groups. Before the interprofessional simulations, 66% of students showed good or very good skills,

whereas after the interprofessional simulation, the rate improved to 95%.[38] Moreover, students agreed that IPE enhanced their teamwork and communication skills. [39]

Lastly, students emphasized the need for institutional financial support through IPE policy implementation and structured monitoring. It is essential to involve policymakers and educational managers, as they have not yet fully understood the need for IPE to address issues in health professions.[36] Once they overcome this challenge, it should lead to advocacy and the integration of IPE among their priorities.

Strengths and limitations of the study

One of the strengths of this study is that it provides valuable, context-specific insights into IPE in a low-resource setting, contributing to a growing body of knowledge in global health education. Another strength is the inclusion of pre-finalist and finalist students across various health disciplines (e.g. medicine, nursing, midwifery, mental health), that allows enriching the data with a broad range of perspectives from participants. The findings from this study emphasize the role of IPE in fostering collaboration which is essential for the health care teamwork and patient outcomes in multidisciplinary healthcare settings. Lastly, but not the least, the results can guide the development or enhancement of interprofessional curricula at the University of Rwanda, and in similar educational contexts across Sub-Saharan Africa. However, the limitations of this study could be limited mainly related to the qualitative methods used to achieve the objectives. One of them is limited generalizability and replicability to another setting or population even though the value is in the study's transferability to similar settings. The qualitative findings are tied to the specific institutional and cultural context of the University of Rwanda and the intervention deliver. Furthermore, participants may have provided socially desirable responses. Furthermore, the differences in IPE exposure

among students may influence responses, introducing variability that is difficult to control.

Conclusion

While IPE holds significant potential to improve communication, reduce medical errors, and enhance patient outcomes, the structural challenges identified by students, such as professional hierarchies, workload constraints, and gaps in shared training, must be addressed to fully realize these benefits. The proposed strategies of institutional support and the introduction of a dedicated IPE module offer practical solutions that could help overcome these barriers and promote a more integrated, collaborative approach to healthcare education. By acting on these suggestions The CMHS at the UR can create a more conducive environment for IPE to happen, which will lead to graduate healthcare professionals ready for collaborative practice to address the health needs of the community. Further mixed methods design studies are needed to evaluate the impact of the CMHS IPE integration model and areas of improvement.

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Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

PU, JK, JBS, AY, MPU, GFK, RN developed the research protocol; PU, YDN, MPU, CU, PM collected data; PU, AY, CU, GFK drafted and revised the manuscript. All the authors contributed to the review and approved the final version of the manuscript.

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