

ORIGINAL RESEARCH

Exploring the impact of interprofessional simulation on the professional relationships of trainee pharmacists and medical students: a constructivist interview study

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ABSTRACT

Introduction:

Members of clinical teams can hold stereotyped views of one another that can form barriers to interprofessional cohesion and collaboration. Interprofessional education (IPE) is often championed as a way of teaching individuals to be better team players through the adoption of collaborative attitudes and behaviours. However, the potentially detrimental effects of IPE are not well understood. This study used the social identity approach (SIA) as a lens to explore the impact of interprofessional simulation on the identities and professional relationships of trainee pharmacists and medical students.

Methods:

Across three different locations in Scotland, trainee pharmacists were paired with medical students to participate in immersive simulation scenarios with post-scenario debriefs. Participants were individually interviewed shortly after their simulation session, using a semi-structured interview schedule based on SIA. Transcripts were analysed using template analysis, with sub-categorizations of SIA forming the initial coding template.

Results:

Twenty-five interviews were undertaken across both groups. The interprofessional simulation session effectively challenged pre-existing stereotypes. For the trainee pharmacists, the alteration of self-stereotypes influenced motivation through self-enhancement and, in turn, altered group norms via the promotion of genuine collaboration and joint decision-making. However, social comparisons focussed on status remained prominent.

Discussion:

This study has shown that interprofessional simulation can effectively challenge and alter stereotypes (including self-stereotypes), but social comparisons may be less easy to overcome in this context. As it continues to be embedded within healthcare education, the limitations of IPE must be better understood to ensure that the potential value of such opportunities is maximized.

What this study adds

- Fresh insight may be gleaned by viewing the challenges related to integration and collaboration of professional groups within healthcare through a lens of group processes as opposed to interpersonal relationships.
- Social identity approach may be used effectively to explore the social identities and intergroup relations of small groups, such as those that exist within healthcare settings.
- Concerns that interprofessional education (IPE) may reinforce professional stereotypes were not supported by this study which showed that prototype-based perceptions can be effectively challenged and altered.
- Self-stereotypes were also challenged by the interprofessional simulation session, resulting in self-enhancement and increased motivation to engage in collaborative working.
- Intergroup relations between the two groups remained tainted by social comparison that highlighted a difference in status and prestige, suggesting further consideration should be given to this sensitive aspect of IPE.

Introduction

It has been suggested for some time that one of the most pressing challenges in healthcare is that of effective integration and collaboration between the various professional groups involved in an individual patient's care [1]. However, this group-related issue is more often conceptualized and discussed within the clinical environment in terms of interpersonal relationships or operational challenges, as opposed to group processes [1]. The clinical team, composed of many groups, is at risk from both conscious and unconscious biases. Previous research has demonstrated that members of clinical professions often hold stereotyped views of one another which can present barriers to team cohesion and effective interprofessional collaboration [2–5].

The expanded roles of pharmacists within UK hospital settings over the last 15 years include enhanced roles within emergency and acute medicine departments, attendance on ward rounds, leading outpatient clinics and prescribing [6,7]. Consequently, pharmacists have migrated from peripheral members of the healthcare team, to central patient-facing roles. This new position requires a complex, expanded skillset, including the need to work flexibly alongside, and integrate with, other healthcare professionals [6]. Over the last 20 years, interprofessional education (IPE) has been consistently championed as a way of teaching individuals to be better team players through improvements in knowledge, changing attitudes and improving non-technical skills [8,9]. IPE, where 'students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes', [10] has been shown within pharmacy education to be relevant and valued, and to increase confidence in communication with other healthcare professionals [11,12].

Across all disciplines, most IPE occurs at the undergraduate (or prelicensure) level [10], on the premise that students should develop collaborative identities and attitudes early in their educational journey, thereby reducing the chances of siloed professional identities and the resultant detrimental effects on healthcare team cohesion [13]. However, recent questions have been asked about the legitimacy of such claims. After decades of research, there remains inconclusive evidence relating to the impact of IPE on professional practice and healthcare outcomes [14,15]. Most IPE is based on the principles of contact theory; the idea that bringing members of different groups together improves understanding, reduces prejudice and improves intergroup relations [16,17]. More recent work in the field of contact theory has suggested that positive outcomes depend upon the equal status of the participants in each group [18]. Indeed, several recent studies have shown that IPE may actually reinforce professional stereotypes amongst students [19,20]. Whilst IPE feels like an intuitive solution to assisting pharmacy students to develop the expanded skillset they require to thrive in their new position at the centre of healthcare teams, the reality is somewhat more complex. The medical education community is yet to fully understand all aspects of the impact of IPE on learners, and how best to foster collaborative identities, attitudes and behaviours.

Conceptual framework

Social identity approach (SIA) is a social psychology theory that articulates a conceptual approach to group behaviour based on self-categorization and group membership within a social context [21]. It is a set of interconnected concepts that provide a unified psychological explanation of group membership and behaviour that can be used to frame and explore intergroup relationships [22]. Originating in the work of Henri Tajfel in the early 1970s [23], SIA has

grown and evolved into an overarching metatheory that incorporates the related work of many scholars and, since the mid-1990s, has become embedded within the landscape of mainstream social psychology. SIA encompasses two main sub-theories: social identity theory, which focusses on the role of identity in intergroup conflict [24], and self-categorization theory, which relates to the cognitive processes involved in the categorization of self and others [25].

Historically, SIA has been used to explore large-scale intergroup relations and concepts such as prejudice and discrimination. However, over the last two decades, a focus on social interaction within and between small groups has expanded the use of SIA [21]. The potential for application of SIA within the world of medical education has been championed [1,5,13], and previous studies have found it to provide an illuminating framework in the context of the clinical workplace [5,13,26,27]. SIA acknowledges the human predisposition to assimilate oneself as part of an in-group, with a tendency for 'within group' differences to be minimized and 'intergroup differences' to be magnified [28,29]. It has been suggested that social identity-led research may reveal useful insights into questions of professional identity, particularly in relation to 'how different identities are perceived and evoked in the workplace, and how stereotypes are reinforced and corrected (if necessary)' [13]. Immersive simulation is designed to replicate substantial aspects of the clinical environment in order to facilitate the development of skills and attitudes in a controlled and safe way [11,30]. This constructivist study therefore addresses a gap within the IPE literature by using SIA as a lens to explore intergroup relations between trainee pharmacists and medical students, and the impact of interprofessional immersive simulation on both groups.

Aim

The aim of this study is to explore the impact of interprofessional simulation on the social identities and professional relationships of trainee pharmacists and medical students.

Methods

Ethical approval for this study was obtained from NHS Education for Scotland Research Ethics Committee (approval no. NES/Res/13/20/Ph), the University of Glasgow College of Medical, Veterinary & Life Sciences Ethics Committee (application no. 200200055) and the University of Aberdeen College Ethics Review Board (application no. CERB/2021/2/2022). All participants provided written consent to the collection and publication of anonymized results and were free to leave the study at any time, without reason or penalty.

Study design

Trainee pharmacists undertaking their foundation training year (formerly known as pre-registration pharmacists) were paired with medical students to participate in immersive simulation scenarios. Post-scenario debriefs

focussed on a range of technical and non-technical factors, including communication and teamwork. Participants were individually interviewed shortly after their simulation session, using a semi-structured interview schedule based on SIA. Transcripts were analysed using template analysis, with sub-categorizations of SIA forming the initial coding template.

Participant recruitment

In the UK, following completion of a GPhC accredited pharmacy qualification (Masters of Pharmacy [MPharm]), aspiring pharmacists complete their foundation training year. Through NHS Education for Scotland (NES), trainee pharmacists completing their foundation training year were recruited to this study on a voluntary basis. Final-year medical students undertaking their emergency medicine blocks of study were also recruited on a voluntary basis via their respective Universities: Glasgow and Aberdeen. Final-year medical students and trainee pharmacists completing their foundation training year are peers in the sense that both are in their final year of (mostly workplace-based) training prior to obtaining a licence to practice from their respective professional bodies. An email invitation was disseminated to all hospital-based trainee pharmacists in the West and North regions of Scotland and final-year medical students at Glasgow and Aberdeen Universities undertaking their emergency medicine blocks, offering half-day simulation sessions taking place in NHS Ayrshire & Arran and NHS Highland, respectively. All trainee pharmacists and medical students who responded to the initial email invitation were provided with further information via email, relating to the content of the session, the purpose of the study and the optional post-session interview.

Simulation session

The half-day simulation session was delivered across three sites: University Hospital Crosshouse and University Hospital Ayr in Ayrshire, and the Centre for Health Science in Inverness. The simulated environment at all three sites consisted of a single, full-body adult simulator (SimMan Essential; Laerdal) accompanied by paperwork, monitoring equipment, drugs and other consumables akin to a standard emergency department. Ceiling-mounted cameras allowed each scenario to be filmed from a variety of perspectives and relayed in real-time to both the control room and non-participating attendees. A bedside monitor displayed dynamic physiological parameters and the patient voice was transmitted via a wireless microphone. A member of staff, unknown to the participants, played the role of a nurse within each scenario.

Each session was attended by three trainee pharmacists and three medical students, with one of each group participating in each scenario. Each immersive scenario had been carefully designed and piloted (with several groups of trainee pharmacists and medical students who were not study participants), to ensure a combination of appropriately pitched medical and pharmaceutical learning outcomes. The scenarios included for this study were those that performed most consistently in the pilot sessions: acute

stroke with dysphagia, asthma exacerbation and urosepsis on a background of Parkinson's disease. The scenarios were designed to encourage collaborative working and knowledge sharing. Each 15-minute scenario was followed by a debrief lasting approximately 45 minutes, during which discussion of the case and related aspects pertinent to social identity and relationships was facilitated jointly by expert pharmacist (SM-S) and medical (JM) simulation faculty using a co-debriefing model [31]. Debriefing was aided by immediate playback of scenario clips and encouraged articulation of the participants' views of self and others, along with various aspects of identity and the intergroup relations between trainee pharmacists and medical students.

Data collection

Consenting trainee pharmacists and medical students were contacted by email within a week of their simulation session to arrange an individual interview. To comply with COVID-19 travel restrictions and social distancing requirements, all interviews were undertaken by VRT using Microsoft Teams. Individual interviews were preferred due to the ability to explore sensitive and emotive topics, without the presence of peers. The format facilitated deep reflection on individual feelings, assumptions, interactions and relationships [32,33]. A semi-structured approach was adopted, with initial questions based on SIA [21]. Over time, as interviews progressed, questions evolving to allow deeper exploration of emerging themes. Interviews were audio-recorded, anonymized and transcribed verbatim. Data collection ceased when data saturation was reached, defined as the inability to produce new codes [34].

Data analysis

Given the popularity of SIA within mainstream social psychology in recent years, there is a vast body of literature describing the approach and its related concepts. For the purposes of this study, the work of Hogg *et al.* [28] was selected to provide the initial coding template. This description of SIA (summarized in Table 1 with example interview questions) seemed to provide a useful outlook on smaller group dynamics, as opposed to other work centred on large-scale intergroup relations and societal-level concepts such as prejudice and discrimination. It also resonated with the finding of previous work situated within a clinical context, which highlights the prevalence of stereotyping, its impact on intergroup relations and the associated barriers to effective interprofessional collaboration [5,26]. Transcripts were independently coded by VRT and JK in NVivo 12 (QSR International) using template analysis. In template analysis, a coding framework based on prior research or existing theory (in this case based on Hogg *et al.*'s categorizations of SIA) is applied to the data as a lens to illuminate and explore it, with the option for the initial template to be modified and new codes added inductively [35]. Disagreements on coding were resolved with reference to the original publications by Hogg *et al.* [21,28,29,36] and the definitions provided therein, with final decisions made by VRT. Once defined, the emergent themes relating to each

aspect of Hogg *et al.*'s version of SIA were presented to SM-S and JM, experienced clinicians and the facilitators of the simulation sessions, in order to ensure contextual validity and resonance with their facilitation experiences.

Reflexivity

In this constructivist study, the concept of an objective reality has been rejected and, in its place, there is explicit recognition that the results represent VRT's conceptualization of the data, co-constructed by the interactions between VRT, JK, their co-researchers and the participants. VRT is a physician, simulation facilitator and qualitative researcher who had not been involved in the design or delivery of the simulation session. Previously unknown to all participants, she was introduced via email and online as 'a researcher' with the aim of encouraging uninhibited discussion by de-emphasizing any perceived power imbalance [37]. JK is a physician with 9 years of postgraduate clinical training and significant medical education research experience. JM trained as an emergency medicine doctor and now directs the Scottish national simulation centre which has a strong emphasis on IPE. It was recognized that VRT's, JK's and JM's own perspectives, experience, pre-conceptions and hospital-based professional relationships would influence the understanding and interpretation of the interview transcripts. To counterbalance this, emergent themes were discussed regularly and in detail with SMS, a practicing pharmacist and pharmacy educator with over 9 years of clinical experience. FS and AP are academic pharmacists with education leadership roles and significant experience of trainee pharmacists' workplace roles and relationships.

Results

Between December 2020 and March 2021, the simulation session was delivered five times across three sites to a total of 30 participants, 15 trainee pharmacists and 15 medical students. Subsequently, 25 participants (15 trainee pharmacists and 10 medical students) consented to interview, with all interviews taking place between December 2020 and April 2021.

Interviewees were aged between 22 and 32; 19 identified as female (14 trainee pharmacists and five medical students) and six identified as male (one trainee pharmacist and five medical students). Interviews took place between two and 31 days following the respective simulation sessions (mean 7 days) and lasted between 14 and 29 minutes (mean 20 minutes). Results are presented using the conceptual components provided by Hogg *et al.* [28], with the first two categories relating to the broader concept of 'social identity' and the subsequent five categories relating to the broader concept of 'professional relationships' as shown in Table 1. Quotes from trainee pharmacists are indicated by the letters 'TP' and quotes from medical students are indicated by the letters 'MS'.

The social identities of trainee pharmacists and medical students

- (i) **Social identity, collective self and group membership**

Table 1: A summary of SIA as described by Hogg *et al.* [28] with related interview questions

| Conceptual component | Description | Related interview questions |
|---|---|--|
| Social identities of trainee pharmacists and medical students | | |
| Social identity, collective self and group membership | 'A social group is a collection of more than two people who have the same social identity – they identify themselves in the same way and have the same definition of who they are, what attributes they have, and how they relate to and differ from specific outgroups. Group membership is a matter of collective self-construal—“we,” “us” and “them.”' [28] | <ul style="list-style-type: none"> • Do you see yourself as belonging to a particular social group? • What are the attributes of that group? • How are those attributes similar to, or different from, other professional groups with whom you interact? • Did the simulation session confirm or challenge any of your beliefs about those attributes? |
| Social categorization, prototypes and depersonalization | 'People cognitively represent groups in terms of prototypes—fuzzy sets of interrelated attributes that simultaneously capture similarities and structural relationships within groups and differences between the groups, and prescribe group membership-related behaviour'. [28] 'When you categorise someone, rather than see that person as an idiosyncratic individual, you see them through the lens of the prototype—they become depersonalised. Prototype-based perception of out-group members is more commonly called stereotyping: You view 'them' as being similar to one another and all having out-group attributes'. [28] | <ul style="list-style-type: none"> • How do you view trainee pharmacists in general? • How do you view medical students in general? • How do you expect members of each group to behave in the workplace? • Did the simulation session confirm or challenge any of your ideas about how members of each group would behave? |
| Professional relationships of trainee pharmacists and medical students | | |
| Motivation: Self enhancement and uncertainty reduction | 'Positive distinctiveness is driven by a concern for evaluatively positive social identity. People strive to promote or protect the prestige and status of their own group relative to other groups because group evaluation is self-evaluation'. [28] 'People strive to reduce subjective uncertainty about their social world and about their place within it—they like to know who they are and how to behave, and who others are and how they might behave'. [28] | <ul style="list-style-type: none"> • How do medical students and trainee pharmacists relate to each other? • How do you see your role within that relationship? • Did the simulation session confirm or challenge your perceptions of that relationship? |
| Social attraction and group cohesion | 'Reactions to and feelings about fellow members are underpinned by perceptions of how prototypically those others are—how closely they match the group prototype'. [28] 'The network of depersonalised prototype-based positive regard and liking within a salient group represents the affective aspect of group cohesiveness—the warm feeling of oneness with fellow members'. [28] | <ul style="list-style-type: none"> • Did others within the simulation session conform with, or differ from, the ways you expected them to behave? • What do you feel about how you see others within your professional group behave? • Did the simulation session confirm or challenge your feelings? |
| Social comparison | 'Inter-group social comparisons do not strive toward uniformity and assimilation; instead, they strive to maximize differences between self, as in-group member, and other, as out-group member'. [28] | <ul style="list-style-type: none"> • Do you see any differences or comparisons between medical students and trainee pharmacists? • Did the simulation session confirm or challenge your perceptions? |
| Inter-group relations | 'Collective self-conception (social identity) is thus anchored in valence-sensitive social comparisons that strive for similarity within groups and differentiation between groups'. [36] 'At the level of intergroup relations, this idea explains why groups compete with each other to be both different and better—why they struggle over status, prestige, and distinctiveness'. [28] | <ul style="list-style-type: none"> • How do you view the social comparisons between medical students and trainee pharmacists? • Did the simulation session confirm or challenge your views? |
| Social influence, conformity and group norms | 'From a social identity perspective, norms are the source of social influence in groups because they are prescriptive, not merely descriptive. The self-categorisation and depersonalisation process explains how people conform to or enact group norms. Conformity is not merely surface behavioural compliance, it is a process whereby people's behaviour is transformed to correspond to the appropriate self-defining group prototype'. [28] | <ul style="list-style-type: none"> • In what ways do you think your behaviour is dictated by your professional role? • Did the simulation session challenge any of your perceptions relating to the way you might behave in an acute clinical situation? |

The medical student cohort clearly shared a social identity, using 'we' and 'us' to refer to their peers within medical school:

As a medical student I know we're quite a cliquey bunch and I don't think that's a particularly positive thing. [MS4]

The social identity of the medical students was heavily influenced by a perception of inferiority compared to their fully qualified medical colleagues:

...despite the fact that everyone's been through the same process with medical school ...everyone has forgotten what it's like, or most people have forgotten what it's like, to be a medical student and actually we can be very useful... [MS8]

The trainee pharmacists readily identified specific shared attributes that they felt differed from the medical students:

I know as pharmacists we like to take a question, research it and then come back with an answer. [TP13]

The way that the trainee pharmacist and medical student groups related to each other in the simulation session, particularly the level of trust displayed by the medical students, was a source of surprise to the trainee pharmacists:

They [medical students] were listening to what we [trainee pharmacists] had to say. They didn't know some things and we were, you know, I felt quite confident that I knew what I was saying was accurate. [TP4]

I was worried actually that there wouldn't be a role for me in that kind of emergency situation. But I could look at the meds [medications], I knew exactly what they were and actually the medical student was turning round to me like, 'what do we do next?' [TP5]

(ii) Social categorization, prototypes and depersonalization

Medical students described somewhat rigid prototypes that encapsulated their perceived similarities with each other, and differences between them and the trainee pharmacists. This centred on the medical student perception of a pharmacist's primary role being to identify the errors made by doctors.

I've had quite a few, not run ins, but quite a few interactions with pharmacists, but it's mainly pharmacists coming through and telling you that you've done things wrong as such, or picking up on mistakes. [MS13]

Pharmacists were perceived as lone workers by the medical students, and as extremely knowledgeable professionals who often kept themselves quite separate to the rest of the healthcare team.

They [pharmacists] kind of stand on their own and look at their laptop, going through all the drugs. You know, you can see them, but you don't really talk to them. [MS7]

I tend to see just pharmacists working by themselves, checking discharge medicines and working solo, separate to the rest of the doctors and the nurses. [MS5]

They [pharmacists] always seem to know everything. That's generally the impression I get is, if you don't know something the pharmacist will probably know. [MS15]

The perception of superior knowledge was also interwoven into how the trainee pharmacists perceived the medical students, but it was accompanied by a sense that medical students and doctors can be overconfident in their decision-making:

I've always thought they're [medical students] all-knowing and they know everything. [TP1]

I think doctors, the medics and doctors I've met, can be quite gung-ho about things. Maybe not take some things as seriously or maybe not find issues that I find as serious as a pharmacist would. [TP8]

The trainee pharmacists described feeling intimidated by doctors and – by extension – medical students. They felt medical students and doctors could be 'quite cocky' [TP5] and 'dismissive of pharmacists' [TP6].

The trainee pharmacists also described some self-stereotyping, although this wasn't often positive:

You tell people that you're a pharmacist and they're like, okay, and they think, the kind of shopkeeper stereotype... [TP10]

I suppose pharmacists are very pernickety, they pick out all the details, all the little things that can go wrong and maybe doctors sometimes don't have the time for that. [TP7]

The simulation session appears to have challenged some of the pre-existing prototypes and encouraged each group to reconsider their stereotypical views of the other.

I think I will see them [medical students] more as a human being than a superhero. [TP5]

We [medical students] hadn't really appreciated that we [medical students and trainee pharmacists] were going to be working on the wards together, and how we could help each other out. I just don't think I actually understood it as much. [MS1]

The professional relationships of trainee pharmacists and medical students

(iii) Motivation: Self enhancement and uncertainty reduction

There was some evidence of self-enhancement and in-group favouritism expressed by the medical students, particularly in relation to their future roles as doctors:

A doctor's voice and a doctor's position is valued; everybody else is secondary, most of the time, whether it's a nurse, a pharmacist, a PA [physician's assistant], or even advanced nurse practitioner. [MS14]

The trainee pharmacists felt that they were better placed to gain a comprehensive overview of the clinical situation, compared to the other healthcare providers involved:

I think because medics and nurses can get so wrapped up in the situation in front of them, whereas when you're not directly dealing with the patient, it's actually, you can kind of look at it and it's, like, a bigger picture. [TP13]

The trainee pharmacists also evaluated their knowledge favourably when compared with that of the medical students, which bolstered their self-confidence and provided clarity in relation to their role within that particular social context:

There was a lot of things that I would consider quite basic that they [medical students] didn't know. [TP5]

It's probably made me appreciate more what a pharmacist does because before I just expected doctors to know as much information about medicines as I did, but I've kind of realised my role in that situation and how a pharmacist can help with things like that. [TP2]

(iv) Social attraction and group cohesion

Group cohesion amongst the medical students was driven in part by a sense that they were able to make bold decisions, whilst the pharmacists provided a safety net:

Junior doctors, or doctors in general, have the attitude of 'we'll do this and the pharmacist will pick up the mistakes'... you do it knowing you've got that safety net. [MS13]

However, as the prototype of the medical student in-group as 'knowledgeable leader' was challenged by the simulation sessions, the feelings about fellow in-group members also began to alter as the prototype-fit of some colleagues weakened:

I can see that people dismiss the other healthcare teams who help when they're there, because the main focus is 'the doctor fixed me and that's why I'm here'. No, the doctor helped as part of the team, but everybody else worked together to make you better, and I think we need to shed the light and make it more of a discussion, that it is not just us and there is no ladder. It's more of a circle, and we all just pull together. It's just about time to break the stereotype, I think, it's 2021, so it's about time. [MS14]

Likewise, the trainee pharmacists had their prototype-based social attraction challenged through a change to their feelings relating to the in-group prototype, which had thus far valued caution above virtually all other attributes:

I find that the pharmacists that I've worked with have been, some of them have been, very cautious about certain things. Perhaps overly cautious in some cases where it's almost to the detriment of getting things done because it's too cautious.... maybe I've been kind of, brainwashed by my training, so to speak. [TP8]

(v) Social comparison

Social comparison processes that strive to identify and maximize differences between in- and out-group members

were evident in the descriptions that each group gave of the other, particularly in relation to their roles within an acute situation:

For us [medical students], we are told to see the patient first because, I mean, we always should see them first. Whereas the pharmacists, they are more used to going to the notes to read through the whole story, figure out what's wrong with them and how that leads to the decision making for medications. [MS5]

I think I'll have different priorities to, say, a medic, but then it's identifying each skills and strengths. [TP1]

(vi) Intergroup relations

The trainee pharmacists expressed some frustration that their future roles as pharmacists did not seem to have the same social standing as the medical students' future roles as doctors:

I would say with the job role of a doctor there comes that kind of respect and again, just in the media as well, they'll say about doctors and things like that. Sometimes I will see things, they are talking about a doctor and I'm like, I don't know if that is probably the best person to talk to, you would probably be better speaking to an expert pharmacist on that matter. But, yeah, I think that kind of view that society has of a doctor, they are quite highly thought of. That's just, kind of, innate. I didn't really want to question them. [TP5]

I suppose just because I see them [medical students] as a wee bit above us, so I don't know if I should be ordering them about. [TP7]

Whilst the trainee pharmacists felt there was a difference in prestige between the two groups, this had been mitigated to some extent by the simulation session:

If I was with a pharmacist and I had to approach a doctor and talk to them about a patient, I found I struggled with it because I wasn't really sure how to approach them. But I feel like now, just establishing a relationship with some of the doctors or medical students, and just getting to know them, make it a lot easier to communicate. [TP2]

Flattening of the perceived hierarchy seemed to result in the trainee pharmacists being more willing to work in partnership with medical students and other healthcare professionals in the future:

I'd definitely be quite confident with speaking to doctors, speaking to other health professionals about things I wasn't sure of, as well as other pharmacists, just everyone really, if I wasn't sure about something. And I'd have maybe a slightly better understanding of what they know that I may not. [TP4]

However, the perceived difference in status and prestige was not echoed by the medical students reflecting on the simulation session:

[I was] feeling like you were with a peer pharmacist and nobody felt better than each other. Everyone was on a level playing field, everyone recognised that everyone had

their own things and useful knowledge to contribute to a situation and make it better. [MS13]

(vii) **Social influence, conformity and group norms**

Self-categorization and depersonalization dictate the actions of individuals through conformity to group norms according to the appropriate self-defining group prototype. As the simulation session challenged some of the pre-existing prototypes and encouraged each group to reconsider their stereotypical views of the other, group norms were also challenged. The medical students came to realize that, in the context of an acute situation, their individualistic behaviour was not always the best way to ensure optimum clinical care:

I feel like I'd maybe say I changed the fact they [pharmacists] can have a role in an acute setting. I would never have thought to call a pharmacist as one of my, like, first ports of call, whereas now I think I would consider that. [MS1]

Similarly, the trainee pharmacists identified a normative behaviour of waiting until 'medical' decisions had been made before getting involved in a patient's care. The simulation challenged this by highlighting the benefits of genuine collaboration and joint decision-making earlier in the process of care:

I've probably always thought they [medical students] were quite sure of themselves. And actually, it was seeing their reflections afterwards about, 'actually no, I wasn't sure when I was making this decision', or 'perhaps I could have asked for help at this point instead of waiting'. So, just seeing that and realising that, actually, they're going through the same sort of decision-making processes as we [trainee pharmacists] are, and they have the same sorts of doubts, was quite interesting... so, it's good to know that we're all on the same page and actually that's why it's so important to make decisions together, because you can then share that knowledge. [TP3]

Discussion

This study aimed to explore the impact of interprofessional simulation on the identities and professional relationships of trainee pharmacists and medical students, using the lens of SIA. Through its constructivist nature, the study did not aim to explain or predict using linear reasoning (as do positivist theories), but rather to better understand the complex and interwoven issues of professional identity, stereotypes and group norms, and how they may impact on intergroup relations and effective interprofessional collaboration.

Both groups commenced the simulation sessions with strong social identities and fairly rigid prototype-based perceptions, or stereotypes, of out-group members. These largely conformed with the stereotypical profiles of other health and social care professional groups that have been described by students arriving at university with, for example, doctors rated most highly on academic ability [2]. Such stereotypes were challenged by the simulation sessions, following which trainee pharmacists were

more readily perceived by the medical students as team players, rather than lone workers, and medical students were perceived by the trainee pharmacists as fallible, as opposed to all-knowing and overconfident. Previous studies have demonstrated mixed results, with one showing that IPE can reduce negative stereotypes between doctors and nurses [3], but another demonstrating that IPE reinforced the stereotypical perceptions held by physiotherapy and podiatry students of each other's professions [5]. Previous work has also demonstrated that once healthcare staff are removed from the workplace and put in controlled settings, tribalism, hierarchical and stereotype behaviours largely disappear [27]. It might therefore be the case that such behaviours are much more attributable to workplace culture than to the engrained beliefs of individuals.

Self-stereotyping, the process of categorizing oneself in terms of the attributes of the in-group, was evident in both groups. Typically such self-stereotyping prescribes group-appropriate feelings and actions leading to in-group conformity and trust [28]. However, the simulation session appeared to challenge some of the self-stereotypes, particularly those adopted by the trainee pharmacists. Rather than seeing themselves as the cautious, pernickety, backroom checkers of drug charts, the trainee pharmacists began to see their ability to see the bigger picture and contribute to acute patient management as important to their self-perception. In SIA terms, membership of the latter group of assertive, front-line trainee pharmacists became salient due to the obvious relevance to the immediate situation or improved 'situational accessibility' [38]. This could be seen to influence motivation through self-enhancement and, in turn, alter group norms via the promotion of genuine collaboration and joint decision-making in acute clinical situations. These findings resonate with recent work by Purdy *et al.* [39] which highlights IPE simulation events as 'a place where relationships are forged', with subsequent impact on participants' experience of safety in the real working environment.

The challenging of pre-existing stereotypes (including self-stereotypes), along with the positive social identity effects of the trainee pharmacists recognizing the superiority of their medicine-related knowledge, represent some of the positive impacts of the simulation session. However, the intergroup relations between the two groups seemed to be tainted by a social comparison which attributed higher status to the medical student group. This builds on previous work which has shown that some students react strongly to IPE's failure to discuss professional hierarchies [19,40], and that educational interventions alone may be insufficient to influence the perception of such hierarchies [8]. Sociological power dynamics are rarely discussed in either IPE initiatives or within the IPE literature [8]. Such conversations would appear to be important to allow the positive effects of IPE observed in this study to actually foster collaborative identities and attitudes, and change workplace-based behaviours.

Limitations

This study was conducted across three centres in Scotland, facilitating involvement of trainee pharmacists and medical students from various educational institutions. The explicit use of SIA to guide data collection and analysis has resulted in a deepened understanding of the strengths and possible limitations of IPE as it is typically designed and delivered. However, use of a pre-existing framework can also obscure other unrelated themes within the data set. Although interviewed individually, it is possible that some of the participants felt unable to answer all of the interview questions fully and freely, given their potentially sensitive nature. Despite the best efforts of the research team to provide a safe space for discussion, participant caution may have been exacerbated by VRT's professional role. In addition, some of the quotes suggested that, at times, the trainee pharmacists may have conflated the roles of medical student and doctors, making the professional relationships of trainee pharmacists and medical students difficult to explore in isolation. A larger participant cohort would have allowed closer attention to be paid to whether more themes emerged.

Future work

This study has added to the recent body of work exploring the limitations of contact theory as the underlying ideology of healthcare-based IPE. It can no longer be assumed that simply bringing groups together to learn with, from and about each other will result in reduced prejudice and improved intergroup relations [17]. Despite recognizing the need to address hierarchy and power within IPE educational initiatives, the best way to do this remains unclear. Furthermore, the extent to which identity and attitudinal changes prompted by IPE are actually able to influence behaviour within the complex social world of the clinical workplace remains worthy of ongoing investigation. It may be that the system-level changes required to genuinely foster collaborative working require IPE that is targeted at much more senior members of the healthcare teams, with all the complexity and dissent that such a proposal is likely to involve.

Conclusion

This study addresses a gap within the IPE literature by using SIA as a lens to explore intergroup relations between trainee pharmacists and medical students, and the impact of interprofessional simulation on both groups. It has shown that stereotypes (including self-stereotypes) can be effectively challenged and altered, but that valence-sensitive social comparisons focussed on status are less likely to be addressed and overcome. Whilst IPE certainly has an important role to play in the training of current and future healthcare professionals, its limitations must be better understood to ensure that the potential value of such educational opportunities are maximized.

Declarations

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Authors' contributions

VRT led the design of the study, conducted the interviews and analysed the data. JK assisted with the study design and all stages of data analysis, including double coding. SM-S assisted with the study design, co-led the simulation sessions and reviewed the evolving data analysis. AP and FS both assisted with the study design and reviewed the evolving data analysis. JM assisted with the study design, co-led the simulation sessions and reviewed the ongoing data analysis. All authors read and approved the final manuscript.

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Availability of data and materials

None.

Ethics approval and consent to participate

Ethical approval for this study was obtained from NHS Education for Scotland Research Ethics Committee (approval no. NES/Res/13/20/Ph), the University of Glasgow College of Medical, Veterinary & Life Sciences Ethics Committee (application no. 200200055) and the University of Aberdeen College Ethics Review Board (application no. CERB/2021/2/2022). All participants provided written consent to the collection and publication of anonymized results and were free to leave the study at any time, without reason or penalty.

Competing interests

None declared.

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