

Original Article

Nurturing professional identity through a community based education program: medical students experience



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الملخص

أهداف البحث: التعليم القائم على المجتمع له تأثير على أنواع طلاب الطب الذين يتخرجون في نهاية التدريب الطبي. لكن، لم يتم تحديد تأثيره على تطوير الهوية المهنية بوضوح. تكشف هذه الدراسة أدوار برنامج التعليم القائم على المجتمع على تطوير الهوية المهنية.

طرق البحث: أجريت دراسة ظاهرية نوعية على مجموعة من طلاب الطب بجامعة العلوم بماليزيا الذين انهوا برنامج دراسة حالة المجتمع والأسرة. تم جمع المعلومات من خلال مناقشات جماعية مركزة والمجلات التي تعكس رأي الطلبة. أخذت عينات المشاركين من خلال تقنية الاختلاف القصوى للعينات الهادفة. كما تم استخدام ثلاث خطوات للتحليل المواضيعي باستخدام برنامج أطلس لتحديد الفئات والمواضيع الفرعية والموضوعات.

النتائج: تم إنشاء الشخصية، والدور، والهويات الاجتماعية والبحثية التي تساهم في تطوير الهوية المهنية لطلاب الطب من خلال برنامج دراسة حالة المجتمع والأسرة. أظهرت النتائج أن برنامج دراسة حالة المجتمع والأسرة قام برعاية الهوية الشخصية من خلال مهارات التعلم، والمهارات الناعمة والقيم الشخصية. أما المتعلقة بدور الهوية فارتبطت برعاية المرضى من حيث الرعاية الأولية والوعي بين المهنيين. وأما المتعلقة بالهوية الاجتماعية فكانت السمات الواضحة هي الوعي المجتمعي ذو الصلة الثقافية والاجتماعية والسياسية. وكانت النتائج الإيجابية لبرنامج دراسة حالة المجتمع والأسرة هي رعاية مهارات البحث، المتعلقة باستخدام علم الأوبئة وطرق البحث.

الاستنتاجات: تشير النتائج إلى أن برنامج دراسة حالة المجتمع والأسرة عزز تطوير الهوية المهنية بين طلاب الطب. البيانات الحالية سلطت الضوء وقدمت أفكاراً على أهمية دمج التعليم القائم على المجتمع في منهج الطب لإعداد أطباء المستقبل.

الكلمات المفتاحية: المعتمد على المجتمع؛ الهوية المهنية؛ الوعي السياسي؛ طلاب الطب؛ النوعي

Abstract

Objectives: Community-based education (CBE) has an impact on the types of medical students produced at the end of medical training. However, its impact on professional identity development (PID) has not been clearly understood. This study thus explores the effect of the CBE program on PID.

Methods: A qualitative phenomenological study was conducted on a group of Universiti Sains Malaysia medical students who had finished the Community and Family Case Study (CFCS) program. Data were gathered through focused group discussions and student reflective journals. Participants were sampled using the maximal variation technique of purposive sampling. Three steps of thematic analysis using the Atlasti software were employed to identify categories, subthemes, and themes.

Results: Personal, role, social, and research identities were generated that contribute to the PID of medical students through the CFCS program. The results indicate that the CFCS program nurtured personal identity through the development of professional skills, soft skills, and personal values. Pertaining to role identity, this is related to patient care in terms of primary care and interprofessional awareness. Pertaining to social identity, the obvious feature was community awareness related to culture, society, and politics. A positive outcome of the CFCS program was found to be its fostering of research skills, which is related to the use of epidemiology and research methods.

Conclusion: The findings indicate that the CFCS program promotes PID among medical students. The current data highlight and provide insights into the importance of

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integrating CBE into medical curricula to prepare future doctors for their entry into the profession.

Keywords: Community-based education; Medical students; Political awareness; Professional identity; Qualitative study

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Introduction

There are three aspects of identity: (a) Personal identity is characterized by individual history, experience, personality, feelings, goals, and values; (b) role identity refers to one's assumed social or professional functions, activities, and responsibilities; and (c) social identity is the commitment to the values and goals of a specific group.¹ In medical education, professional identity development (PID) plays an essential role in the transition medical students undergo when becoming doctors.² Medical student professional identities are formed due to different factors such as various experiences, role models, and curricula.^{3,4} Medical students' identities are conceptualized as both socially constructed and deeply personalized, whereby they develop medical professional identity through formal, non-formal, and hidden curricula.⁵

Upon entering medical school, baseline professional identity factors, which include gender, profession, previous working experience in the field, understanding of team work, knowledge of the profession, and cognitive ability, were found to be valid predictors of future PID.⁶ Studies have shown that medical students build up professional identity through their life experiences.^{2,4} Therefore, medical school serves as a training ground for the development of professional identity among tomorrow's doctors, in which desirable professional behaviors are cultivated.⁷ In 1984, Harden et al. were the first of many investigators to demonstrate the movement in medical education away from traditional, didactic curricula to innovative curricula incorporating community-based education (CBE).^{8,9} In CBE, students learn and acquire professional competencies (i.e., basic clinical, research, and communication skills) in a community setting established

through community-campus collaboration, which provides students with contextualized and experiential learning that prepares them for providing patient care in local communities.^{9–14} However, despite nearly 40 years of CBE program implementation worldwide,¹⁵ its effect on PID among medical students has not yet been adequately explored.

The Community and Family Case Study program

Concerning CBE, the School of Medical Sciences (SMS) at Universiti Sains Malaysia (USM) began implementing the Community and Family Case Study (CFCS) program in 1981,¹⁶ and the program has been evolving ever since. It is a compulsory CBE program for medical students during their medical training, and it is a key requirement that must be completed prior to their final examinations.¹⁶ Based on the CBE taxonomy,¹⁷ the CFCS program is categorized as a community-based research program, in which, in addition to CBE, research methods are learned through community engagements. Using this approach, students are expected to apply and acquire the necessary knowledge, values, and skills to become competent and professional doctors.¹⁶ Figure 1 summarizes the structure of the CFCS program and student activities at different phases of medical training.

Phase II of the CFCS program is completed during the second and third year of medical studies. The purpose of Phase II is to develop communication skills, soft skills, and research skills through community-based learning experiences. The program begins with classroom-based theoretical lessons on public health, specifically on the principles of biostatistics, epidemiology, and occupational and environmental health.¹⁶ The students (about 20 students per group) are then placed in rural communities in the Kelantan district where they participate in homestays in local villagers' houses for 10-day visits. The students need to complete health, social, and educational issues surveys in their villages and then conduct statistical analyses to identify the main health problems in the village. Based on this research, the students must then propose an intervention program to address the issues.¹⁶ Subsequently, the students are required to conduct pre- and post-intervention survey analyses. At the end of Phase II of the CFCS program, the students present their community intervention project to their class and professor as an oral presentation as well as in a written report.

Phase III of the CFCS program consists of an individual as well as a group project during year 4 of the medical program.

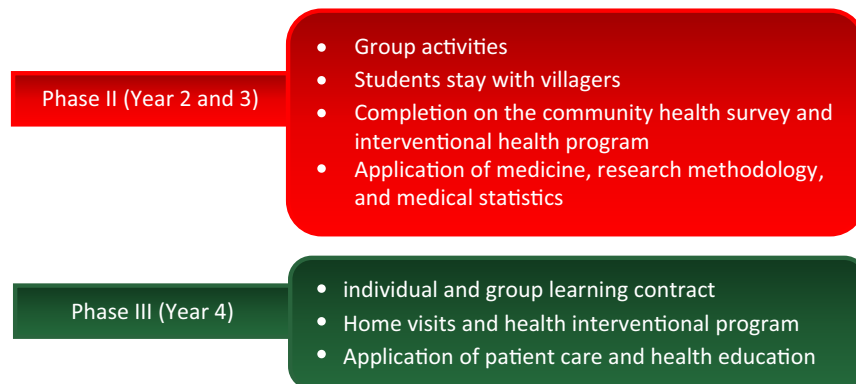


Figure 1: The structure of the CFCS program and student activities at different phases of medical training.

This phase aims to develop self-directed learning skills, foster a sense of responsibility for the students' own professional development, and encourage students to explore community health services.¹⁶ For the individual project, each student needs to partner with a patient of low socioeconomic status and generate a learning contract. For the group project, each group (consisting of 15–20 students) must select a group of patients suffering from a chronic disease.¹⁸ For both the individual and group projects, the students need to work with their supervisors to identify the problems faced by their patients and set their learning objectives, strategies to achieve the objectives, evidence of accomplishment of the learning objectives, and propose criteria for assessment.^{16,18} At the end of the program, they must produce evidence of their accomplishment based on the learning contract, which will be assessed by their supervisors and peers.

Having discussed PID and CBE, it is worthwhile highlighting the important issue of unprofessional behaviors in the medical profession, such as greedy doctors who deceive patients by having them undergo unnecessary procedures and tests¹⁹ and those who breach patient confidentiality by disclosing medical records.²⁰ These concerns reflect the need to educate quality medical professionals through CBE programs who will serve their nation and society in a professional and honest manner. In light of these concerns, the present study explored the experiences of medical students during the CFCS program and discussed its role in PID.

Materials and Methods

Study design, setting, and sample

A qualitative study was conducted and the phenomenology approach was employed to explore the experience of medical students related to their PID during the CFCS program. A purposive sampling method was performed, since it is the most reliable sampling method available for qualitative research.²¹ The maximum variation sampling technique was performed to select participants representative of different ethnic groups and of both genders. The sample size was estimated based on the saturation concept,²² in which saturation was achieved when there was no new theme generated in relation to the research objectives.

There were two eligibility criteria for participants in this study:

- i. The participants had to be in their final year of the medical program at USM;
- ii. The participants had to have completed all phases of the CFCS program.

A pool of participants was identified with the assistance of the Undergraduate Academic Office in the SMS at USM. To promote participation, the students were briefed with an explanation of the study aims and research method, and were provided with a consent form. Only those who consented participated in the focus group discussion (FGD) sessions. The participants were informed that they could withdraw from the study at any time for any reason. Their identity was kept anonymous and withdrawal from the study did not have any academic repercussions.

Data collection and analysis

Prior to data collection, ethical approval for the study was obtained from the Human Research Ethics Committee of USM. Data were collected through FGDs and student reflective journals (SRJ). The participants were then assigned with a unique code (ID) to maintain their anonymity and confidentiality. The students who agreed to participate were contacted by phone and the FGD sessions were arranged according to their availability.

An interview protocol was developed to standardize the FGD interviews. It consisted of an introduction, main interview questions, probing questions, and conclusion (see [Appendix A](#)). During the FGD sessions, researcher bracketing was applied to avoid internal and external bias.²³ One method applied to ensure researcher bracketing was writing notes on important points mentioned by the participants and observable feelings during the FGDs.²³

In this study, three steps of data analysis were employed (see [Figure 2](#)). Data management was commenced with the first data set gathered from the FGD sessions and SRJ. Thematic analysis was carried out to identify categories, subthemes, and themes.

Ethical considerations

This study obtained the ethical approval of the USM Human Research Ethics Committee. All participants who volunteered to participate in the FGD sessions were given a detailed participant information sheet and were clearly briefed on the study's procedures, de-identified information, risks, and benefits. To ensure no data leakage and to maintain the confidentiality of sensitive material/information regarding the CFCS, each participant agreed not to discuss the details of the study outside of the FGD sessions. The participants received a token of appreciation to prevent undue influence. The incentive was deemed appropriate for this group of participants to recognize their time and effort spent participating in the FGD sessions despite their busy academic schedules.

Results

A total of 21 students, including 15 Malays, four Chinese, and one Indian, voluntarily participated in the FGD sessions. A saturation point was reached during the third session, but we continued with the fourth session to ensure that no new theme could be generated. A total of 116 SRJs were collected from the USM CFCS office.

From the thematic analysis, four themes and seven subthemes were identified, and 20 categories were generated that related to PID during the CFCS program based on the experiences described by the medical students (see [Figure 3](#)).

Theme 1: Personal identity

Every individual builds their personal identity through multiple factors throughout their personal life experiences.¹ In the present study, the participants expressed that the CFCS program gave them opportunities to choose their own patient based on their preferred case. They were able to apply their knowledge in context, and knowledge transfer

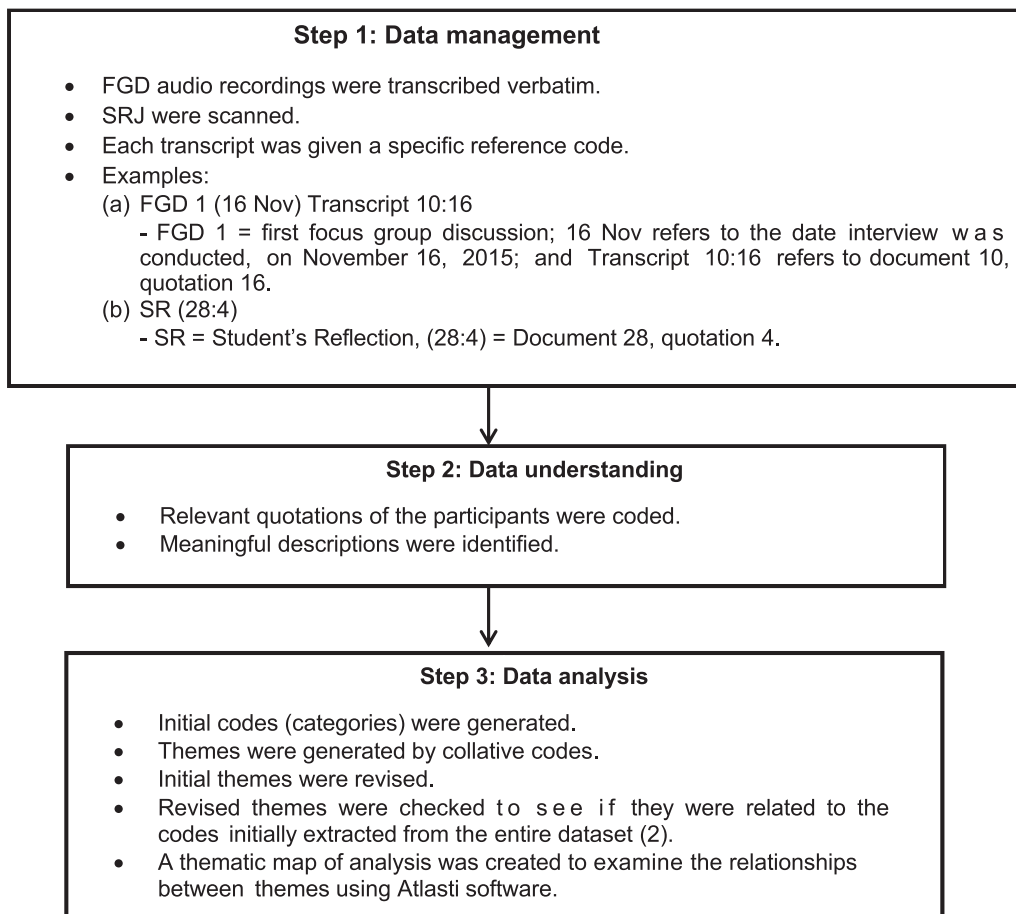


Figure 2: Steps in the data analysis.

occurred through communication with the community. As the program allowed them to interact directly with the community members, it enhanced their soft skills such as teamwork, leadership, decision-making, coping, planning, and communication skills. In addition, the participants also shared that they developed personal attributes such as empathy, creativity, personal satisfaction, honesty, patience, and sacrifice. Some of the students' quotes concerning PID from the FGD sessions and SRJ are displayed in [Table 1](#).

Theme 2: Role identity

Role identity for a doctor is an expansive process and essential part of medical students' PID.² The participants mentioned that the CFCS program helped them to develop their role identity by providing experiences in patient care, particularly primary care and interprofessional awareness. Several quotes generated from the participants on role identity are displayed in [Table 2](#).

Theme 3: Social identity

Social identity is formed when an individual undergoes experiences and observations in a community setting, and develops a new social awareness of themselves.¹ The CFCS program contributes a unique opportunity for medical

students to develop their social identities in a local community. [Table 3](#) shows some interesting quotes shared by the participants about developing their cultural, social, and political awareness through the CFCS program.

Theme 4: Research identity

It was found that the participants gained some experience in developing their research identity during the CFCS program. Research skills are essential for academics in the evidence-based era. In this study, two subthemes were identified under research skills, which are the use of epidemiology and research methodology ([Table 4](#)).

Discussion

Personal identity

This study found that developing personal skills and values were perceived as being beneficial learning experiences that facilitated the development of self-competency. It is worth noting that personal identity is not exclusively developed through a single life event; rather, it is a continuous development process that occurs through individual life experiences that also contribute to role and social identity development.¹ The data shows that learning skills are acquired through

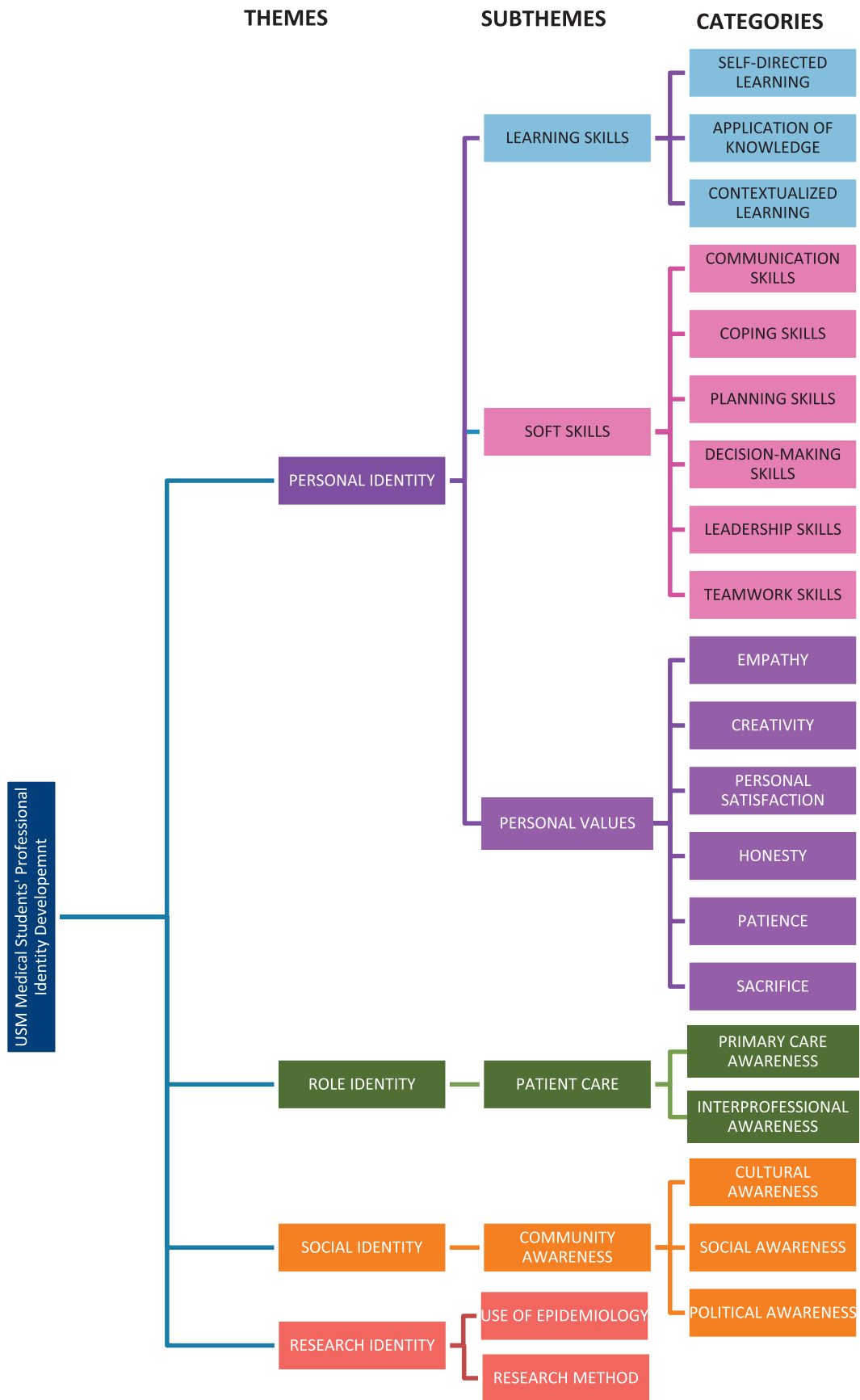


Figure 3: USM medical students' professional identity development through the CFCS program.

Table 1: Participants' quotes from the FGD and SRJ on personal identity.

Subthemes	FGD quote	SRJ quote
Learning skills	"... then I tried to explain it ... not only just explain what will happen but why it happened." [FGD 1 (16 Nov) Transcript – 28:32]	"I am able to deliver my knowledge about chronic kidney disease, its risk factors, symptoms, and how to control the disease ..." [SR (15:60)]
Soft skills	"... so, I made a decision, I want to deal with only one person." [FGD 2 (18 Nov) Transcript – 31:27]	"Whenever I visited her, I tried to listen to her life problems ..." [SR (35:5)]
Personal values	"... (I felt) pity for her (patient) because she lives with her daughter who divorced and had many children." [FGD 3 ²⁴ Transcript – 32:38]	"I learned how to communicate ... by putting myself in their shoes." [SR (18:12)]

Table 2: Participants' quotes from the FGD and SRJ on role identity.

Subthemes	FGD quotes	SRJ quotes
Primary care awareness	"We promote any healthy lifestyle to them (the villagers) ... such as advising them to reduce their salt intake ..." [FGD 1 (16 Nov) Transcript – 28:8]	"... we must ensure a mutual understanding of disease between patient and doctor ... thus, we achieved a desirable and optimal patient condition." [SR (16:6)]
Interprofessional practice	"... having connected to different people from different angles, like from nutrition, etc." [FGD 4 (10 Dec) Transcript - 34:42]	"... multidisciplinary approach from psychiatry, occupational therapy, behavioral therapy, psychotherapy ..." [SR (15:24)]

Table 3: Participants' quotes from FGD and SRJ on social identity.

Subthemes	FGD quotes	SRJ quotes
Cultural awareness	"But not everyone (villagers) goes to the 'surau' (mosque) ... some of them there, missed (the announcement)." [FGD 1 (16 Nov) Transcript – 28:6]	"... especially in Kelantan, ... food preparation is more prone to sweetness." [SR (15:32)]
Social awareness	"... we went for a house visit, and we saw that he (the patient) did not have family support." [FGD 3 ²⁴ Transcript – 32:43]	"... factors that influence the patient's progression, such as financial burden, accessibility to healthcare, and preconceived knowledge." [SR (15:7)]
Political awareness	"... if we (show support for) one side (political party), another side of the villagers and their supporters don't come to our activity." [FGD 1 (16 Nov) Transcript - 28:14]	

Table 4: Participants' quotes from the FGD and SRJ on research identity.

Subthemes	FGD quotes	SRJ quotes
Use of epidemiology	"... compared to national prevalence, the people in that village have more ... heart attacks than the national average." [FGD 1 (16 Nov) Transcript – 28:3]	"That time, we had to conduct surveys ... on the dominant illness surveyed." [SR (21:1)]
Research methodology	"... we gave the same questionnaire ... there was an improvement in terms of knowledge ... and objectives, which was to assess the knowledge." [FGD 4 (10 Dec) Transcript – 34:37]	"That time, we had to conduct surveys and determine a few interventions ..." [SR (21:1)]

various learning techniques and life experiences, and are considered to be a part of professional competency.²⁵ An earlier study reported that USM medical graduates who underwent the CFCS program had better learning skills, which suggests the greater development of personal identity as was found in the present study.²⁶ One possible explanation is that students are allowed to choose their own clinical case study for their learning project that must be approved by supervisors. Many of the students expressed that they learned to how to conduct their own research on relevant information related to their clinical case study, and later to plan appropriate interventions to address the needs of their patient. Furthermore, the students admitted that they were able to apply theoretical and clinical knowledge to the real context during the community intervention project, and considered themselves as knowledge providers. It is worth mentioning that the aforementioned attributes are considered to be essential elements of medical professional identity,²⁷ thus indicating that the CFCS program exposes students to authentic learning environments that enable them to immediately exchange knowledge with patients and communities. These results are aligned with the goal of CBE to produce medical graduates who are equipped with applicable professional knowledge.^{9,10,13}

Soft skills are essential elements of life-long learning that enhance personal development such as interpersonal skills and desirable career attributes.^{28,29} Communication skills are one of the essential soft skills targeted by CBE programs.^{9,18} The present study found that the medical students developed several soft skills as a result of the CFCS program, including communication skills, coping skills, planning skills, decision-making skills, leadership skills, and teamwork skills. Students gained these skills through various experiences during the CFCS program. For example, their interactions with community members, patients, peers, and supervisors; modeling behavior based on their observations and experiences during the CBE³⁰; and their effort to understand the local dialect and culture all contributed to their development of soft skills.³¹ These findings are consistent with those of a previous study, which found that USM medical students improved their communication skills through participation in the CFCS program.³² In addition, another study obtained similar results whereby students who participated in a CBE program developed better communication skills than those who did not.³³ Joubert et al. (2006) also found that students' communication skills improved through observations and experiences during CBE. Another important soft skill is the ability to cope with stressful situations, because medical students are vulnerable to psychological distress, as evidenced by the high prevalence of psychological distress among them, which is often higher than that of the general population.^{34–36} Interestingly, among the coping skills frequently mentioned by the students were active coping (e.g., finding alternative ways to achieve their goal and create an effective team), positive thinking (i.e., maintaining a positive mind-set), and planning (e.g., effective time management and discussion with supervisors/committee). These strategies are classified as functional coping strategies that can help to mitigate the effects of stress.^{37–40} A possible explanation for their high levels of stress is that the students were exposed to various challenges during the CFCS program, including financial challenges, transportation

planning, human resource management, handling patient diversity, and communicating effectively with supervisors, yet the students dealt with these stressful circumstances tactfully and effectively.

As indicated previously, the soft skills related to group dynamics such as decision-making skills, leadership skills, and teamwork skills are as important as communication skills and coping skills.³² The students shared their experience of being a leader in terms of collaborating with other parties in the community, delegating jobs and tasks to other group members, as well as planning and decision-making. It is noteworthy that a CBE program in the United States reported that leadership skills were enhanced during the program.⁴¹ Apart from leadership skills, teaching medical students about teamwork skills is a real challenge,⁴² as evidenced by medical schools employing various teaching methods such as case studies, non-medical teambuilding activities, and role plays⁴³ for that purpose. Despite the common challenge of fostering the development of teamwork skills in educational programs, the CFCS program was found to effectively contribute to their development through the group project task. An interesting finding from a previous study conducted on a pre-registered house officer, reported that students rarely got the opportunity to make clinical decisions in patient management.⁴⁴ Therefore, the CFCS program may serve as a good platform for medical students to experience making clinical decisions in patient management.

Another important aspect of personal identity found in this study was personal values, including empathy, creativity, personal satisfaction, honesty, patience, and sacrifice. While other medical programs attempt to nurture the growth of empathy in medical students through drama and role play,⁴⁵ the USM students believed that the CFCS program helped to build their empathy through exposure to real people's health and living conditions (i.e., socioeconomic, psychosocial, and sociocultural), thus fostering feelings of empathy and a better understanding of patients' conditions.⁴⁶ A previous study has echoed that empathy is an area of concern among medical students; therefore, any opportunities to nurture empathy during medical training are highly valuable.⁴⁷ Regarding creativity, the medical students were forced to become more creative to deliver the best community project at the end of the CFCS program—creativity was not explicitly taught in the classroom. This finding is supported by previous studies that demonstrated that medical students had unique ways of expressing their creativity in their own contexts.^{2,27,48} Another interesting finding is that personal satisfaction, honesty, patience, and sacrifice generated from the analysis correspond to the framework of Malaysian medical professionalism.⁴⁹ This fact further supports the positive impact of the CFCS program in the PID of medical students.

Role identity

The most obvious finding to emerge pertaining to role identity is related to primary care and interprofessional awareness in patient care. This suggests that the CFCS program provided authentic learning experiences in medical PID as the students were responsible for assuming the role of doctors during patient management and home visits. As echoed by

Tan (2014), professional experiences considered to be authentic learning contributed to PID. Similarly, a mixed-method study on CBE in Japan demonstrated comparable results in creating primary care awareness among medical students through community hospital and clinical postings for several weeks.⁵⁰ These facts explain the reason for some medical schools adopting primary care-oriented training programs as CBE.¹⁷ The CFCS program is a unique CBE program because students are exposed to hospital-, community-, and home-based patient care over a three-year period.^{16,18} Another important finding related to role identity in interprofessional collaboration as reflected by the medical students, which is, in fact, an important element of the recent Malaysian medical professionalism framework.⁴⁹ The CFCS individual and community projects that involved other disciplines such as dietetics and nutrition, family medicine, and community medicine demonstrated to the students the importance of inter-disciplinary collaboration as a part of a holistic approach to patient management. Consistent with the literature, an interdisciplinary curriculum coupled with community involvement was shown to expose medical students to public service and social activism.^{51,52} It can therefore be stated that medical schools should adopt these common features of CBE, as community projects and a holistic approach to patient care are essential for students to appreciate the importance of interprofessional collaboration in the field of medicine.

Social identity

The obvious feature of social identity was community awareness related to culture, society, and politics. Social identity is directly related to group activities and interactions with people that contribute to the development of social skills.¹ The common goal of medical schools that employ CBE is to foster the development of the social skills of their students.^{9,11,17,53} In the present study, the medical students were exposed to a unique local culture, which required them to understand the community they were working with in order to be tactful in their approach to treating patients. This feature was also addressed by an Australian study on medical education, in which they had implemented a program to foster the development of competence and cultural sensitivity among medical students.⁵⁴ An earlier study also showed that medical students who underwent CBE were able to relate psychosocial issues to human rights, which helped them to gain insight into the psychosocial contexts of their patients.⁵⁵ An interesting aspect related to community awareness is political awareness, and a previous study showed that good public health professionals must be aware of political conditions.⁵⁶ This study explained that medical students encountered challenges while planning and implementing a community project due to different political beliefs in the community. This experience had been an eye-opener to them regarding the possible influence of political beliefs on community behavior toward health intervention.

Research identity

Despite the barriers preventing the development of research skills among undergraduate medical students, such as the lack

of time due to heavy academic demands, the lack of motivation and rewards, the lack of proper mentoring by lecturers, the lack of knowledge and research skills, and the lack of funding for research,^{57,58} USM has positioned the CFCS program as a research-oriented program and the main agenda in its curriculum since 1979.¹⁷ This theme was found to be exclusive, as it is not included in any of the three categories in professional identity theory.¹ While other medical students are less aware of research activities,⁵⁹ the present study found that students gained two research skills as a result of participation in a CBE program, including the use of epidemiology and research methods. In the medical profession, research skills are not directly related to the roles of a doctor. However, research skills serve as added value to a doctor's set of professional skills. The expanding medical world requires a lot of research and evidence-based medical practice. Thus, research skills may soon be included as one of the required competencies of medical students, as studies have demonstrated the favorable effect of integrating research skills into medical curricula.^{8,57,60} A recent study reported that a one-month research rotation improved research activity and enhanced students' chances of being accepted to postgraduate programs.⁶⁰ In addition, a study comparing biology students who underwent community-based research training developed higher critical thinking abilities than those who attended traditional lectures.⁸ These initial results are suggestive of a link between CBE and research skills among medical students. Therefore, future studies on the current topic are recommended. It is worth noting that the CFCS program has successfully attained its purpose of fostering the development of research skills among medical students since its inception.^{16,17,53}

Limitations and recommendations

Despite the promising outcomes of the present study, there are several limitations that should be noted. First, the transferability of these findings should be made within the individual context of each university, since CBE practices differ from institution to institution. Therefore, we recommend that the PID of CBE at different institutions should be explored and compared to verify the transferability of the present study's findings. Second, this study mainly depended on qualitative measures; therefore, the results may only apply to the medical student sample of the present study. Thus, adding quantitative measures in future research may enable the findings to be generalized to the population. Lastly, the research method was based on phenomenology; therefore, adding other research methods such as ethnography, discourse analysis, or action research will enable the data to be triangulated from different perspectives on PID.

Conclusion

The findings clearly indicate that the CBE program promoted the development of professional identity among medical students through personal identity, role identity, social identity, and research identity. These data highlight and provide insights into the importance of integrating CBE into medical curricula to prepare medical students to become competent and qualified medical professionals.

Authors' contributions

AA, MZMN, and WZWM designed the study and the data collection methods. AA and MSBY analyzed and interpreted the data, provided logistical support, and conducted the final review of the results. AA wrote the initial and final draft of the article. All authors are responsible for the findings, have critically reviewed the paper, and have approved of the final draft.

Conflicts of interest

The authors declare that there is no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jtumed.2017.12.001>.

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