BMJ Open

Fostering Student Motivation toward Community Healthcare: A Qualitative Study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-039344
Article Type:	Original research
Date Submitted by the Author:	12-Apr-2020
Complete List of Authors:	Yahata, Shinsuke; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Medical Education Takeshima, Taro; Fukushima Medical University, Department of General Medicine, Shirakawa Satellite for Teaching and Research (STAR); Fukushima Medical University, Center for Innovative Research for Communities and Clinical Excellence (CIRC2LE) Kenzaka, Tsuneaki; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Career Development Okayama, Masanobu; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Medical Education
Keywords:	MEDICAL EDUCATION & TRAINING, PRIMARY CARE, QUALITATIVE RESEARCH

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

Fostering Student Motivation toward Community Healthcare: A Qualitative Study

Words: 3861

Shinsuke Yahata[1], Taro Takeshima[2], Tsuneaki Kenzaka[3], and Masanobu Okayama[1]

[1]Division of Community Medicine and Medical Education, Kobe University Graduate School of Medicine, Kobe, Japan.

[2]Department of General Medicine, Shirakawa Satellite for Teaching and Research (STAR), Fukushima Medical University, Fukushima, Japan, and the Center for Innovative Research for Communities and Clinical Excellence (CIRC2LE), Fukushima Medical University, Fukushima, Japan.

[3]Division of Community Medicine and Career Development, Kobe University Graduate School of Medicine, Kobe, Japan.

Correspondence: Shinsuke Yahata, Division of Community Medicine and Medical Education, Kobe University Graduate School of Medicine, 2-1-5, Arata-cho, Hyogo-ku, Kobe, Hyogo, 652-0032, Japan; telephone: +81-78-382-6732; e-mail: yahata-jci@umin.ac.jp.

Keyword: community healthcare, community-based medical education, motivation, medical student, self-determination theory

Abstract

Objectives: This study aims to explore the motivation mechanisms (including the factors and the processes) of medical students toward community healthcare (CH) in community-based medical education (CBME) program.

Design: This is a qualitative study using individual in-depth semi-structured interviews.

Setting: Participants were recruited from regional quota (*chiikiwaku*) medical students of Kobe University, Japan using consecutive sampling.

Participants: Fourteen students participated. The median (inter-quartile range) age of participants was 23 (23-24); half were in their sixth year and half in their fifth year.

Methods: From September to December 2018, the interviews were audio-recorded and transcribed verbatim. The transcribed interview data was analyzed according to the "Steps for Coding and Theorization" method. Self-determination theory was used as theoretical framework.

Results: While exploring the factors that influence the students' motivation toward CH, three themes emerged: preparing for the future, community relationships, and psychological effects. Preparing for the future was developed through five experiences

(i.e., empathy for the community, grasping the universal demands for CH, understanding the practices of CH, finding a role model, and conflicts between personal life and career), evoked three basic psychological needs (i.e., autonomy, competence, and relatedness needs), and promoted internalization (i.e., introjected, identified, integrated, and intrinsic regulation). Community relationships evoked autonomy and relatedness needs and promoted integrated regulation by robustly constructing the internal community, to which the students belong, and through harmonization with the external community, such as community residents. Psychological effects, namely affect heuristic and framing effects, obtained from positive experiences improved students' conceptual image of CH and directly promoted intrinsic regulation.

Conclusions: The authors revealed the motivation mechanisms of medical students toward CH. These mechanisms consisted of the three factors evoking basic psychological needs and promoting internalization. These mechanisms should be incorporated into CBME programs to effectively foster CH professionals.

Strengths and limitations of this study

- This study describes the motivation mechanisms of medical students toward

community healthcare more precisely than previous findings.

- It is unclear whether all medical students will be motivated to participate in community healthcare through similar mechanisms since the study focuses on a specific group of participants.
- Social desirability bias occurring through the relationship between teachers and students cannot be completely eliminated.

INTRODUCTION

Elderly patients with multimorbidity or irremediable diseases have been increasing in number as global populations age.[1] Thus, the healthcare paradigm has shifted from conventional medical care, which cures diseases at hospitals, to community-based integrated care, which supports patients in the community.[2] These social contexts demand nurturing healthcare professionals with insights into the concept of community healthcare (CH), defined as the integration of health services and social care in the community,[3] who can effectively manage integrated care systems.[4]

Furthermore, the uneven distribution of doctors is a serious global problem. The World Health Organization published global policy recommendations regarding access to health workers,[5] which several countries have adopted to confront this challenge. The

Japanese government has implemented a regional quota system (*chiikiwaku*) to manage this problem.[6] *Chiikiwaku* allows medical students to receive prior benefits (e.g., special entrance qualifications and scholarships) on the condition they work for a specified medical institution (especially in rural areas) for a certain period after graduation, during which they are required to practice CH. In other words, they are required to become professionals who properly manage integrated care and compensate for the uneven distribution of doctors. Therefore, *chiikiwaku* students need to deepen their learning of CH during undergraduate studies. Motivating *chiikiwaku* students to study CH is necessary to promote proactive learning.

Numerous studies have demonstrated that community-based medical education (CBME) programs, which have been implemented worldwide, improve CH skills [7-10] and increase motivation toward CH, primary care, and rural practice.[7 9-17] However, although the overall effectiveness of these programs has been evaluated, and some educational components have been described,[18 19] the knowledge of mechanisms that motivate students to participate in CH are insufficient. Elucidating these mechanisms can provide significant insights for designing and reconstructing CBME programs to nurturing future CH physicians. As such, our research objective is to explore the factors and processes that influence the *chiikiwaku* students' motivation toward CH.

METHODS

Participants

We used consecutive sampling to recruit participants until obtaining saturation, i.e. no further themes or constructs could be identified in the analysis.[20] There were 19 *chiikiwaku* students (female = 10, male = 9) in their fifth and sixth years at Kobe University. First, the first author (YS) contacted them by e-mail; then, the students who expressed interest in participating were informed of the details in person. A total of 14 students (73.7%; female = 9, male = 5) agreed to participate. Participants' median (inter-quartile range) age was 23 (23–24); half were fifth-year and the other half sixth-year students. Five participants subjectively recognized their hometown as rural and nine as urban. Written informed consent was obtained from all participants.

Kobe University *Chiikiwaku*

Candidates who want to join Kobe University's *chiikiwaku* must receive recommendations from graduate high schools and then take the specific entrance examination. After admission, they receive scholarships from the Hyogo prefectural government, which is responsible for securing medical care in Hyogo prefecture's rural areas. They have the obligation to work for nine years post-graduation at rural medical

institutions assigned by the prefectural government. These systems are common throughout Japan, with some differences. *Chiikiwaku* students constitute about 10% of all Kobe University medical students.

Kobe University CBME

All pre-clinical students, including *chiikiwaku* students, attend university CH lectures, programs at nursing care facilities, and special needs schools. During their clinical years, they are exposed to home care, and a community-based clerkship program for about two weeks or one month is available. Additionally, certain special programs are provided mainly for *chiikiwaku* students: a two-day early exposure program in rural community clinics, three-day summer program in rural medical institutions, and a health education program for the elderly in rural areas.

Data collection

We used qualitative study methods. We chose individual, in-depth, semi-structured interviews to delve deeply into interviewees' experiences and co-create meanings by reconstructing perceptions of experiences.[21] Before the interviews, we prepared the interview form, including eight questions based on the students' past practical CH-related experiences (see Supplemental appendix). After a pilot study with one student, it was

adapted and confirmed that it had no major matters of concern. YS interviewed all study participants from September to December 2018. Each interview lasted about 60 minutes and was audio-recorded and then transcribed by YS.

Supplemental appendix. Interview form used in the study.

1. What do you think about community healthcare (CH)?
2. Why do you think so?
3. What were the events that affected your feelings about CH?
4. How did the events affect your feelings about CH?
5. How does the experience of home care affect your feelings about CH?
6. How does the experience of day care/service affect your feelings about CH?
7. How does the experience of health education for local residents affect your feelings about CH?
8. How does the experience in the rural area affect your feelings about CH?

Data analysis

The transcripts were analyzed following the 'Steps for Coding and Theorization' (SCAT) method.[22] SCAT consists of a four-step coding process: (1) determining focused words from the segmented text; (2) determining words that can replace the words in (1) with words from outside of the text; (3) determining words that explain the words in (1) and (2); and (4) creating themes and constructs, then writing a story-line and generating theories. These analysis processes were all done in Excel 2013 (Microsoft Corporation, Redmond, WA, USA). We chose this approach for its usability, process explicitness, and

improved reflectability and falsifiability.

YS analyzed the data in each step, and a co-researcher (OM) reviewed the transcripts and analysis results as an inquiry audit. These processes assessed the analysis' dependability and confirmability.[23]

Research paradigm and researcher characteristics

We chose the constructivist paradigm to acknowledge researchers' subjectivities.[24] As undergraduates, YS and OM were obligated students, such as *chiikiwaku*, then worked at rural medical institutions for nine years post-graduation. Currently, they engage in community medicine education and research at the university while practicing at rural medical institutions.

Theoretical framework

Self-determination theory (SDT)[25] was used as the theoretical framework to explore influencing factors on *chiikiwaku* students' motivation to be involved in CH. This framework comprises three basic psychological needs: autonomy, competence, and relatedness. The need for autonomy is a propensity to self-organize experiences and behaviors. The need for competence refers to a propensity to affect the environment and attain valued outcomes. The need for relatedness is a propensity to love and care for and

be loved and cared for by others. SDT also classifies the regulation types of internalization related to motivation: external, introjected, identified, integrated, and intrinsic regulations. External regulation refers to the act being controlled by external contingencies such as rewards or punishments, for example 'I can earn money providing CH.' Introjected regulation refers to avoiding guilt or raising self-esteem by internalizing external pressures, for example 'If I provide CH, I would be praised; if not, I would be looked at with disdain.' Identified regulation derives from the recognition and acceptance of the behavior's importance, for example 'I provide CH because it is important.' Integrated regulation refers to the act of integrating external identifications into other aspects of the self, for example 'I provide CH because it fits my beliefs.' In intrinsic regulation, the act itself becomes the purpose with a strong interest, for example 'I provide CH because it is very interesting.' This regulation type brings the most autonomous motivation.

Patient or public involvement

This research was done with partially participants involvement. Participants were not invited to comment on the study design and methods, however were invited to comment on the results and editing of this document for readability or accuracy.

RESULTS

While exploring the factors that influence the *chiikiwaku* students' motivation toward CH, three themes emerged: preparing for the future, community relationships, and psychological effects.

1. Preparing for the future

Chiikiwaku students prepared for the future through five experiences: 'empathy for the community,' 'grasping the universal demands for CH,' 'understanding the practices of CH,' 'finding a role model,' and 'conflicts between personal life and career.'

1.1 Empathy for the community

Students generated empathy by comparing their own thoughts, living environments, and cultural backgrounds with those of community residents and healthcare professionals through community dialogues and experiences.

> I've been to many different areas…When I talk to local people, I can see their lives are not different from those in other areas. I think it's very important to listen to local people. (Student 5, male, rural)

This empathy results from the recognition that there is little difference between them.

Even if there were some differences, they still felt empathy.

> In certain areas I've visited, I heard I couldn't survive without a car. As my parents don't have a car, I could never imagine a life in which a car is indispensable. I understood what such a life is like when I went there…It may be simply that different people have different lifestyles. (Student 6, female, urban)

This empathy created a sense of familiarity and security in the community and reduced psychological barriers to continuing to belong to the community in the future. These fulfilled the students' 'autonomy needs' to be part of the community.

1.2 Grasping the universal demands for CH

Students saw that patients and their families appreciated healthcare professionals and directly experienced the community residents' expectations of the students. These experiences satisfied 'competence needs,' which involve being evaluated by others, and the willingness to commit to this universal demand fulfilled students' 'relatedness needs.' These experiences also promoted 'introjected regulation,' 'identified regulation,' and 'integrated regulation.'

> Every individual I saw expressed gratitude to the doctor.…It was a good

experience. I'm not sure if this will be my life's work, but I thought it would be nice to commit to this kind of work for a certain period. (Student 14, female, urban)

The residents were kind. I was impressed when they said to me, 'Please come back.' This experience made me feel that doctors like us are in demand. (Student 13, male, rural)

Conversely, community residents' excessive expectations for students led to students' fears that they may not be able to fulfill them, which threatened the students' 'autonomy needs.'

Of course, I would be glad…if I could actually save people's lives in the future. That being said, the pressure is too much, I wouldn't be able to do everything perfectly. Therefore… I feel it would be challenging. (Student 7, female, urban)

1.3 Understanding the practices of CH

Students understood CH practices such as holistic medical care, comprehensive care, home care, preventive care, and a community-oriented approach, then imagined their future practice. Replacing uncertainty about their own future practices with practical

knowledge fostered their self-efficacy and satisfied their 'autonomy needs.' Furthermore, if students were interested in these practices, their 'competence needs' were stimulated, which promoted 'integrated regulation' or 'intrinsic regulation.'

> It goes without saying that I want to do this job. These experiences are really helpful in that I can now imagine how I would be working in the future. They were very effective opportunities because I could think about what I need to know. (Student 12, male, urban)

1.4 Finding a role model

If the students' role models' practices were deemed achievable for students in the future, their 'competence needs' were evoked by their desire to emulate the role model, which promoted 'integrated regulation' or 'intrinsic regulation.'

> The doctor was really…the best…. He can be an ideal role model. I'm grateful I had many opportunities to see the doctor thereafter. I listened to many of his stories. (Student 5, male, rural)

However, this was obstructed if the students thought the role models' abilities were beyond their own capacities. Furthermore, their anxiety about carrying out

unfeasible practices in the future threatened their self-efficacy and 'autonomy needs.'

> I really admire them. I think they're great. On the other hand, I'm not confident I can be like them…. There are a lot of genuinely smart doctors and those who are passionate about CH. If I was asked if I have such a strong passion, I don't have that much passion, so I'm worried if I can actually become a doctor like them. (Student 7, female, urban)

1.5 Conflicts between personal life and career

Students felt a potential conflict between their imagined future private lives, including marriage and childcare, and their career ideals (e.g., attaining specialist certifications). Reducing this conflict secured their 'autonomy needs' of daily lives and career choices.

> I felt that life events like marriage and having a child will inevitably weaken motivation. That's why, having listened to Dr. A., I'm glad her talk helped me figure out how I can overcome such challenges. (Student 4, female, urban)
>
> Specialist physician…I have been worried constantly because I don't know what to do if I became interested in obtaining certification. I mean, I thought I would be far behind if I continued as a *chiikiwaku* physician. However, I've heard *chiikiwaku* physicians have been able to obtain specialist

certification…. I appreciate this because I no longer have to be worried. (Student 4, female, urban)

2. Community relationships

Students' relationships with their internal community (i.e., the one to which they belong) and external community influenced their motivation to be involved in CH.

2.1 Internal community

Internal community in this case meant the medical students interested in CH. The sense of belonging was increased by constructing a robust community and the students' feeling of belonging to it, which satisfied their 'relatedness needs.'

Listening to different views and expectations of CH helps increase motivation. This is because through such experiences, I can feel first-hand that I am part of a group of people who take CH seriously. (Student 12, male, urban)

Furthermore, the community support system made students feel secure. In this regard, students' affinity with the community of medical doctors had an interesting role. For some *chiikiwaku* students, their relationships with the local government's administrative department that has the authority to decide their future working location

was perceived as an employee–employer relationship. However, when students realized there were doctors in the administrative department and that these doctors were involved in supporting their careers, the feeling of an employee–employer relationship was eased. This secured their 'autonomy needs' regarding career choice.

> As the government always tells us where to go, I've been feeling that I'm made to work for them. As I didn't know that certain doctors are working as government officers, I was thinking that those who don't know much about what doctors do are unilaterally deciding what we should do. It was valuable to learn that the government includes those who understand doctors' work and that such people care about our careers and are trying to develop a system in which we can have equal opportunities. (Student 1, female, urban)

2.2 External community

External community in this case meant both critics of CH and community residents. Those who criticize CH can decrease students' motivation. However, if the internal community functioned in a robust manner and students recognized their own community belonging, then these conflicts might conversely strengthen their 'relatedness needs' and promote 'integrated regulation.'

> From time to time, I came across a doctor who unshakably believes in specialists. I didn't enjoy listening to such a doctor. …I would have a myopic view if I constantly listened to people who keep on saying that community physicians are better. I would rather like to say I have seen that side and I dare to have chosen this side. At that time, I felt uncomfortable. Though, in hindsight, that experience helped me choose the right path. (Student 1, female, urban)

Additionally, as newcomers, students felt anxious about creating relationships with the community of residents. However, as students recognized that they were accepted into the community, the external community became an internal community. Furthermore, community residents' dedication to CH and medical education evoked students' desires to contribute to the community. This satisfied their 'relatedness needs' and promoted 'integrated regulation.'

> As I was very welcomed there, I would like to give back to them by working hard. …When they said, 'Is there anything to learn from us?' and 'I would be more than happy to help you if it would be beneficial,' I felt that I was given such valuable opportunities to learn. (Student 10, female, urban)

3. Psychological effects

Psychological effects, namely the affect heuristic and framing effects, influenced students' motivation to contribute to CH. These psychological effects brought about an improvement in students' conceptual image of CH and promoted 'intrinsic regulation' directly.

3.1 Affect heuristic

This is a psychological effect in which positive or negative emotions affect the judgment of things quickly and automatically.[26] CBME elements such as unique experiences in the community, interaction with others, enjoyable and relaxed practice environments, acquisition of fresh knowledge and skills, and finding a role model induced enjoyable, happy, and positive feelings in students. These positive feelings elicited the affect heuristic, impacting their conceptual image of CH.

> For clinical clerkship in university, for example, I have to take training seriously, but the summer program was rather fun, a more harmonious training and hence was quite interesting. (Student 5, male, rural)

3.2 Framing effect

This is also a psychological effect in which a positive or negative presentation of something creates a decision-making bias.[27] Showing that CH professionals had an enjoyable work- and lifestyle and describing how rewarding CH can be to students created a framing effect that CH was worthwhile. This affected students' conceptual image of CH.

> All doctors look happy there. Every time I go there, I'm reminded they all enjoy working there. Every doctor is thriving there. (Student 4, female, urban)

DISCUSSION

We explored the factors and processes that influence the *chiikiwaku* students' motivation toward CH using SDT as a theoretical framework. Three main themes and some subthemes emerged: (1) preparing for the future (namely empathy for the community, grasping the universal demands for CH, understanding the practices of CH, finding a role model, and conflicts between personal life and career), (2) community relationships (namely internal and external communities), and (3) psychological effects (namely the affect heuristic and framing effect). These themes and subthemes can have both a positive and negative impact depending on the level of fulfillment of the experiences and whether

students accept them.

Comparison with previous findings

Previous studies have described the clinical practice factors that influence medical students' primary care orientations, including broad practice scope,[28-31] role models,[29 30 32] specialty,[28 30] work satisfaction,[28 32] lifestyle,[29 30] exposure to different places,[32] and rural rotation.[32] Some studies have described the clinical practice factors that influence medical students' orientations toward rural healthcare, including general practice,[33] clinical skill,[33] patient interaction,[33] role models,[34 35] lifestyle,[33 36] social network,[34] and informal curriculum.[34] Our study's findings are consistent with these previous findings. However, the novel significance of our study is that it includes detailed descriptions of how these factors affected students' motivation.

Lessons for CBME programming

How should our results be used when designing and reconstructing CBME programs so as to effectively foster students' motivation to become involved in CH? We suggest five possible approaches.

First, there should be many opportunities to interact with community residents as well as patients. This would provide 'empathy for the community,' 'grasping the

universal demands for CH,' 'external community relationships,' and a 'positive affect heuristic.'

Second, patients and community residents should be asked to share their appreciation for healthcare professionals and health-related concerns with students. This would make 'grasping the universal demands for CH' easier.

Third, healthcare professionals should provide positive messages to students about why they continue their work, how they feel rewarded, what they enjoy in work and life, and how to deal with conflicts between their private lives and careers. This would fulfill 'finding a role model' and 'positive framing effect' and reduce 'conflicts between personal life and career.'

Fourth, there should be time for students to interact with each other and have an enjoyable leisure time. This enhances 'internal community relationships' and elicits a 'positive affect heuristic.'

Fifth, there should be time to become familiar with the community environments and cultures. If these become enjoyable experiences for students, 'empathy for the community' and a 'positive affect heuristic' will be created.

Incorporation of these items into CBME programs may encourage students to consider CH as a post-graduation option.

Limitations

There were two limitations in our study. First, study participants were limited to *chiikiwaku* students from a single university. There are many variations in the *chiikiwaku* system, including selection methods, scholarship options, and working style after graduation, among others. *Chiikiwaku* doctors who graduate from Kobe University may work at small medical institutions in rural areas, but some *chiikiwaku* doctors who attended other universities than Kobe may work after graduation at tertiary care medical institutions in the prefectures where their own universities were located. Thus, it is unclear whether all obligated students will be motivated to participate in CH through similar mechanisms. In this regard, further research targeting medical students who belong to other universities or have no obligations are needed.

Second, this study was conducted with students by their teachers. Thus, their hierarchical relationship could be a problem.[37] We cannot completely eliminate the social desirability bias where students give desirable responses to us.[38] To address this problem, some research processes, such as requesting student participation, collecting data, and writing the transcripts, were done only by YS. Although YS is a faculty member, YS has not been involved in the judgment of academic achievement and promotion of participating students. The co-researcher (OM) has been involved in the judgment of

students, so he joined the analysis after students' personal identity information was deleted. We communicated this to the students and made an effort to create an atmosphere where they could relax and respond freely.

CONCLUSIONS

The *chiikiwaku* students developed a motivation to be involved in CH through preparing for the future, community relationships, and psychological effects that were obtained from various experiences. These mechanisms should be incorporated into CBME programs to further encourage students' positive attitudes toward CH.

ACKNOWLEDGEMENTS

The authors wish to thank Editage (www.editage.com) for English language editing.

COMPETING INTERESTS

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

FUNDING

This study was supported by Grants-in-Aid for Scientific Research from the Japan Society for the Promotion of Science (JSPS KAKENHI Grant Number JP16K08870).

ETHICAL APPROVAL

The Institutional Review Board of Kobe University Graduate School of Medicine approved this study on July 17, 2018 (number 180087).

CONTRIBUTORS

YS was chiefly responsible for the study design, acquisition, analysis, and interpretation of the data and drafting of the manuscript. OM contributed to the study design, analysis, and interpretation of the data, and a critical revision of the manuscript. TT and KT contributed to the study design and the critical revision of the manuscript. All of the authors approved the final version of the manuscript.

REFERENCES

1. Marengoni A, Angleman S, Melis R, et al. Aging with multimorbidity: a systematic review of the literature. *Ageing Res Rev* 2011;10(4):430-9. doi: 10.1016/j.arr.2011.03.003 [published Online First: 16 March 2011]

2. Tsutsui T. Implementation process and challenges for the community-based integrated care system in Japan. *Int J Integr Care* 2014;14:e002. doi: 10.5334/ijic.988 [published Online First: 31 January 2014]

3. World Health Organization Centre for Health Development (Kobe, Japan). *A glossary*

of terms for community health care and services for older persons. Kobe, Japan: World Health Organization Centre for Health Development. 2004. https://apps.who.int/iris/handle/10665/68896 (accessed 3 April 2020).

4. Kainuma M, Kikukawa M, Nagata M, et al. Competencies necessary for becoming a leader in the field of community medicine: a Japanese qualitative interview study. *BMJ Open* 2018;8(4):e020082. doi: 10.1136/bmjopen-2017-020082 [published Online First: 19 April 2018]

5. World Health Organization. (ed.) *Increasing Access to Health Workers in Remote and Rural Areas Through Improved Retention: Global Policy Recommendations.* Geneva, Switzerland: WHO Press, 2010.

6. Matsumoto M, Inoue K, Takeuchi K. Quality of care in Japan: an additional strategy. *Lancet* 2011;378(9807):e17. doi: 10.1016/S0140-6736(11)61841-2 [published Online First: 6 December 2011]

7. Barrett FA, Lipsky MS, Lutfiyya MN. The impact of rural training experiences on medical students: a critical review. *Acad Med* 2011;86(2):259-63. doi: 10.1097/ACM.0b013e3182046387 [published Online First: 21 December 2010]

8. Kelly L. (ed.) *Community-based medical education: a teacher's handbook.* Radcliffe Publishing: London, England, 2012.

9. Crampton PES, McLachlan JC, Illing JC. A systematic literature review of undergraduate clinical placements in underserved areas. *Med Educ* 2013;47(10):969-78. doi: 10.1111/medu.12215 [published Online First: 11 September 2013]

10. Lee SW, Clement N, Tang N, et al. The current provision of community-based teaching in UK medical schools: an online survey and systematic review. *BMJ Open* 2014;4(12):e005696. doi: 10.1136/bmjopen-2014-005696 [published Online First: 3 December 2014]

11. Laven G, Wilkinson D. Rural doctors and rural backgrounds: how strong is the evidence? A systematic review. *Aust J Rural Health* 2003;11(6):277-84. doi: 10.1111/j.1440-1584.2003.00534.x [published Online First: 18 December 2003]

12. Okayama M, Kajii E. Does community-based education increase students' motivation to practice community health care?--a cross sectional study. *BMC Med Educ* 2011;11:19. doi: 10.1186/1472-6920-11-19

13. Viscomi M, Larkins S, Gupta TS. Recruitment and retention of general practitioners in rural Canada and Australia: a review of the literature. *Can J Rural Med* 2013;18(1):13-23. [published Online First: 25 December 2012]

14. Pfarrwaller E, Sommer J, Chung C, et al. Impact of Interventions to Increase the

Proportion of Medical Students Choosing a Primary Care Career: A Systematic Review. *J Gen Intern Med* 2015;30(9):1349-58. doi: 10.1007/s11606-015-3372-9 [published Online First: 16 July 2015]

15. Strasser R, Worley P, Cristobal F, et al. Putting communities in the driver's seat: the realities of community-engaged medical education. *Acad Med* 2015;90(11):1466-70. doi: 10.1097/acm.0000000000000765 [published Online First: 29 May 2015]
16. Budhathoki SS, Zwanikken PA, Pokharel PK, et al. Factors influencing medical students' motivation to practise in rural areas in low-income and middle-income countries: a systematic review. *BMJ Open* 2017;7(2):e013501. doi: 10.1136/bmjopen-2016-013501 [published Online First: 25 February 2017]
17. Johnson GE, Wright FC, Foster K. The impact of rural outreach programs on medical students' future rural intentions and working locations: a systematic review. *BMC Med Educ* 2018;18(1):196. doi: 10.1186/s12909-018-1287-y [published Online First: 16 August 2018]
18. Crampton PES. *Medical student learning during longitudinal clinical placements in under-served, deprived, community areas: A qualitative study.* Doctoral theses. Durham University; 2015.
19. Dube TV, Schinke RJ, Strasser R, et al. Transition processes through a longitudinal

integrated clerkship: a qualitative study of medical students' experiences. *Med Educ* 2015;49(10):1028-37. doi: 10.1111/medu.12797 [published Online First: 19 September 2015]

20. Saunders B, Sim J, Kingstone T, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant* 2018;52(4):1893-907. doi: 10.1007/s11135-017-0574-8 [published Online First: 14 September 2017]

21. Dicicco-Bloom B, Crabtree BF. The qualitative research interview. *Med Educ* 2006;40(4):314-21. doi: 10.1111/j.1365-2929.2006.02418.x [published Online First: 1 April 2006]

22. Otani T. "SCAT" A qualitative data analysis method by four-step coding: Easy startable and small scale data-applicable process of theorization. *Bulletin of the Graduate School of Education and Human Development (Educational Sciences), Nagoya University* 2007;54:27-44 (In Japanese with English abstract).

23. Polit DF, Beck CT. *Nursing Research: Principles and Methods.* 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2004.

24. Denzin NK, Lincoln YS. *The SAGE Handbook of Qualitative Research.* 5th ed. Thousand Oaks, CA: SAGE Publications; 2017.

25. Deci EL, Ryan RM. The "What" and "Why" of Goal Pursuits: Human Needs and the

Self-Determination of Behavior. *Psychol Inq* 2000;11(4):227-68. doi: 10.1207/S15327965PLI1104_01

26. Finucane ML, Alhakami A, Slovic P, et al. The affect heuristic in judgments of risks and benefits. *J Behav Decis Mak* 2000;13(1):1-17. doi: 10.1002/(sici)1099-0771(200001/03)13:1<1::Aid-bdm333>3.0.Co;2-s

27. Tversky A, Kahneman D. The framing of decisions and the psychology of choice. *Science* 1981;211(4481):453-58. doi: 10.1126/science.7455683

28. Dixon AS, Lam CL, Lam TP. Does a brief clerkship change Hong Kong medical students' ideas about general practice? *Med Educ* 2000;34(5):339-47. [published Online First: 12 April 2000]

29. Jordan J, Brown JB, Russell G. Choosing family medicine. What influences medical students? *Can Fam Physician* 2003;49:1131-7. [published Online First: 7 October 2003]

30. Scott I, Wright B, Brenneis F, et al. Why would I choose a career in family medicine?: Reflections of medical students at 3 universities. *Can Fam Physician* 2007;53(11):1956-7. [published Online First: 15 November 2007]

31. Ohta R, Ryu Y, Katsube T, et al. Students' perceptions of general medicine following community-based medical education in rural Japan. *J Gen Fam Med*

2019;20(6):236-43. doi: 10.1002/jgf2.274

32. Codsi MP, Rodrigue R, Authier M, et al. Family medicine rotations and medical students' intention to pursue family medicine: Descriptive study. *Can Fam Physician* 2019;65(7):e316-e20. [published Online First: 14 July 2019]

33. Stagg P, Greenhill J, Worley PS. A new model to understand the career choice and practice location decisions of medical graduates. *Rural Remote Health* 2009;9(4):1245. [published Online First: 1 December 2009]

34. Roberts C, Daly M, Kumar K, et al. A longitudinal integrated placement and medical students' intentions to practise rurally. *Med Educ* 2012;46(2):179-91. doi: 10.1111/j.1365-2923.2011.04102.x [published Online First: 14 January 2012]

35. Kawamoto R, Uemoto A, Ninomiya D, et al. Characteristics of Japanese medical students associated with their intention for rural practice. *Rural Remote Health* 2015;15(2):3112. [published Online First: 13 June 2015]

36. Birden HH, Wilson I. Rural placements are effective for teaching medicine in Australia: evaluation of a cohort of students studying in rural placements. *Rural Remote Health* 2012;12:2167. [published Online First: 20 November 2012]

37. Boet S, Sharma S, Goldman J, et al. Review article: medical education research: an overview of methods. *Can J Anaesth* 2012;59(2):159-70. doi: 10.1007/s12630-

011-9635-y [published Online First: 5 January 2012]

38. Nederhof AJ. Methods of coping with social desirability bias: A review. *Eur J Soc Psychol* 1985;15(3):263-80. doi: 10.1002/ejsp.2420150303

Reporting checklist for qualitative study.

Based on the SRQR guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SRQRreporting guidelines, and cite them as:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014;89(9):1245-1251.

		Reporting Item	Page Number
Title			
	#1	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	1
Abstract			
	#2	Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2-3
Introduction			
Problem formulation	#3	Description and signifcance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	4-5
Purpose or research question	#4	Purpose of the study and specific objectives or questions	5

Methods

Qualitative approach and research paradigm	#5	Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenolgy, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability. As appropriate the rationale for several items might be discussed together.	6-8
Researcher characteristics and reflexivity	#6	Researchers' characteristics that may influence the research, including personal attributes, qualifications / experience, relationship with participants, assumptions and / or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and / or transferability	9
Context	#7	Setting / site and salient contextual factors; rationale	6-7
Sampling strategy	#8	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g. sampling saturation); rationale	6
Ethical issues pertaining to human subjects	#9	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	6, 25
Data collection methods	#10	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources / methods, and modification of procedures in response to evolving study findings; rationale	7-9
Data collection instruments and technologies	#11	Description of instruments (e.g. interview guides, questionnaires) and devices (e.g. audio recorders) used for data collection; if / how the instruments(s) changed over the course of the study	8
Units of study	#12	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be	6

		reported in results)	
Data processing	#13	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymisation / deidentification of excerpts	8-9
Data analysis	#14	Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	9-10
Techniques to enhance trustworthiness	#15	Techniques to enhance trustworthiness and credibility of data analysis (e.g. member checking, audit trail, triangulation); rationale	9-10
Results/findings			
Syntheses and interpretation	#16	Main findings (e.g. interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	11
Links to empirical data	#17	Evidence (e.g. quotes, field notes, text excerpts, photographs) to substantiate analytic findings	11-20
Discussion			
Intergration with prior work, implications, transferability and contribution(s) to the field	#18	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application / generalizability; identification of unique contributions(s) to scholarship in a discipline or field	21
Limitations	#19	Trustworthiness and limitations of findings	23-24
Other			
Conflicts of interest	#20	Potential sources of influence of perceived influence on study conduct and conclusions; how these were managed	24
Funding	#21	Sources of funding and other support; role of funders in data collection, interpretation and reporting	24

BMJ Open

Fostering Student Motivation toward Community Healthcare: A Qualitative Study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-039344.R1
Article Type:	Original research
Date Submitted by the Author:	22-Aug-2020
Complete List of Authors:	Yahata, Shinsuke; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Medical Education Takeshima, Taro; Fukushima Medical University, Department of General Medicine, Shirakawa Satellite for Teaching and Research (STAR); Fukushima Medical University, Center for Innovative Research for Communities and Clinical Excellence (CIRC2LE) Kenzaka, Tsuneaki; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Career Development Okayama, Masanobu; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Medical Education
Primary Subject Heading:	Medical education and training
Secondary Subject Heading:	General practice / Family practice
Keywords:	MEDICAL EDUCATION & TRAINING, PRIMARY CARE, QUALITATIVE RESEARCH

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

Fostering Student Motivation toward Community Healthcare: A Qualitative Study

Words: 5643

Shinsuke Yahata[1], Taro Takeshima[2], Tsuneaki Kenzaka[3], and Masanobu Okayama[1]

[1]Division of Community Medicine and Medical Education, Kobe University Graduate School of Medicine, Kobe, Japan.

[2]Department of General Medicine, Shirakawa Satellite for Teaching and Research (STAR), Fukushima Medical University, Fukushima, Japan, and the Center for Innovative Research for Communities and Clinical Excellence (CIRC2LE), Fukushima Medical University, Fukushima, Japan.

[3]Division of Community Medicine and Career Development, Kobe University Graduate School of Medicine, Kobe, Japan.

Correspondence: Shinsuke Yahata, Division of Community Medicine and Medical Education, Kobe University Graduate School of Medicine, 2-1-5, Arata-cho, Hyogo-ku, Kobe, Hyogo, 652-0032, Japan; telephone: +81-78-382-6732; e-mail: yahata-jci@umin.ac.jp.

Keywords: community healthcare, community-based medical education, self-determination theory, expectancy-value theories, emotions

ABSTRACT

Objectives: This study investigated what kinds of experiences influence regional quota (*chiikiwaku*) medical students' motivation to practice community healthcare (CH), and the mechanism of this influence, by focusing on their experiences in a community-based medical education (CBME) program.

Design: A qualitative thematic analysis based on interviews.

Setting: Participants were recruited from the *chiikiwaku* students of Kobe University, Japan, using purposive sampling.

Participants: Fourteen students participated. The median (inter-quartile range) age of participants was 23 (23-24); half were sixth-year and half fifth-year students.

Methods: From September to December 2018, the interviews were audio-recorded and transcribed verbatim. Data were analyzed according to the "Steps for Coding and Theorization" method. Our theoretical framework comprised three internal motives (i.e., needs, cognitions, and emotions) and their subordinate motivation theories self-determination theory, expectancy-value theories, and positive and negative emotions, respectively, were.

Results: Three mechanisms and corresponding experiences emerged: (1) envisioning and preparing for practicing CH (empathy for the community, grasping the demands of CH, understanding the practices of CH, finding a role model, and diminishing the conflicts between personal life and career), (2) belonging to a supportive community (robust construction of students' community for CH and harmonization with community residents), and (3) heuristics and biases (the affect heuristic and framing effect). Student experiences brought about the changes and influences described in the presented mechanisms, and had both positive and negative impacts on their motivation toward CH. These results can be interpreted through the multifaceted lenses of motivation theories.

Conclusions: The authors revealed the motivation mechanisms of medical students toward CH, many of which derived from positive interaction with community residents, healthcare professionals, and other students, and from exposure to attractive community environments and cultures. These experiences should be incorporated into CBME programs to further encourage positive attitudes toward CH.

Strengths and limitations of this study

- This study precisely describes the motivation mechanisms of medical students

toward practicing community healthcare.

- It is unclear whether all medical students will be motivated to participate in community healthcare through similar mechanisms since the study focuses on a specific group of participants.
- Social desirability bias occurring through the relationship between teachers and students cannot be completely eliminated.

INTRODUCTION

Elderly patients with multimorbidity or irremediable diseases have been increasing in number as global populations age.[1] Thus, the healthcare paradigm has shifted from conventional medical care, which cures diseases at hospitals, to community-based integrated care, which supports patients in the community.[2] These social contexts demand nurturing healthcare professionals with insights into the concept of community healthcare (CH), defined as the integration of health services and social care in the community,[3] who can effectively manage integrated care systems.[4] In addition, the impact of the COVID-19 pandemic has highlighted the division between hospital and primary care. There is no doubt that in the case where a patient needs a ventilator, the hospital is the appropriate location. Nevertheless, it has also been shown that primary healthcare also has an essential

role to play in fighting acute infectious diseases.

Furthermore, the uneven distribution of physician manpower among regions in a single country is a serious global problem. The World Health Organization published global policy recommendations regarding access to health workers,[5] which several countries have adopted to confront this challenge. The Japanese government has implemented a regional quota system (*chiikiwaku*) to manage this problem.[6] *Chiikiwaku* allows medical students to receive prior benefits (e.g., special entrance qualifications and scholarships) on the condition they work for a specified medical institution (especially in rural areas) for a certain period after graduation, during which they are required to practice CH. In other words, they are required to become professionals who properly manage integrated care and compensate for the uneven distribution of doctors. However, it has been reported that the willingness of *chiikiwaku* students to remain in medically underserved areas declines from 52.3% to 19.2% during their studies.[7] Withdrawal from the *chiikiwaku* system, which was reported to be about 10%, is also a problem.[8] Moreover, the preference for a primary care career, which is necessary for practicing CH, may decrease during medical school.[9 10] Therefore, it is necessary to continuously encourage *chiikiwaku* students, while they are undergraduates, to maintain and improve their motivation for practicing CH.

Numerous studies have demonstrated that community-based medical education (CBME) programs, which have been implemented worldwide, improve CH skills[11-14] and increase motivation toward CH, primary care, and rural practice.[11 13-21] However, although the overall effectiveness of these programs has been evaluated, and some educational components have been described,[22 23] the knowledge of mechanisms that motivate students to participate in CH is insufficient. Elucidating these mechanisms can provide significant insights for designing and reconstructing CBME programs to nurture future CH physicians. As such, our research objective is to retrospectively investigate what kind of experiences influenced their motivation for practicing CH, and the mechanism of this influence, by focusing on the lived experiences of *chiikiwaku* students in CBME programs.

METHODS

Qualitative approach and research paradigm

We conducted a qualitative thematic analysis using interview data. The Standards for Reporting Qualitative Research (SRQR)[24] were adopted for the presentation of our research. We chose the constructivism paradigm to interpret and understand the meanings of students' experiences.[25]

To interpret how students' experiences influenced their motivation for practicing CH, we used Reeve's concept of three internal motives,[26] and some additional motivation theories, were the foundation for our theoretical framework. There are numerous motivation theories; however, some confusion has arisen from their diversity because of their conceptual overlaps and disagreements.[27] In other words, there is no one theory that can absolutely explain human motivation. We addressed this issue by using the concepts of three internal motives based on their clarity. Reeve defines "motivation" as "a condition inside us that desires a change" and proposes three internal motives for action: needs, cognitions, and emotions. We considered "student motivation toward CH" as "a condition inside students that they desire to practice CH" and adopted these three internal motives as a framework. In addition, in order to explain the three internal motives in detail, we used self-determination theory (SDT),[28] expectancy-value theories (EVT),[29], and positive and negative emotions[30] as subordinate guiding theories. We chose SDT and EVT because they are current, widely recognized theories.[27 31-33] Emotions have been characterized as feeling-arousal-purposive-expressive phenomena, whose components cooperate in a complicated manner and allow us to react adaptively to the important events in our lives.[26] For the purposes of our study, in order to express them more simply, we adopted six positive and six negative emotions.[30]

SDT, which is involved in needs, comprises three basic psychological needs: autonomy, competence, and relatedness.[28] The need for autonomy is a tendency to self-organize experiences and behaviors. The need for competence refers to a desire to affect the environment and attain valued outcomes. Finally, the need for relatedness is a tendency to love and care for and be loved and cared for by others. SDT also classifies the regulation types related to motivation: external, introjected, identified, integrated, and intrinsic regulations.[28] External regulation refers to the act of being controlled by external contingencies such as rewards or punishments. Introjected regulation refers to avoiding guilt or raising self-esteem by internalizing external pressures. Identified regulation derives from the recognition and acceptance of the behavior's importance. Integrated regulation refers to the act of integrating external identifications into other aspects of the self. In intrinsic regulation, the act itself becomes the purpose with a strong motivation. This regulation type leads to the most autonomous motivation.

EVT, which is involved in cognitions, consists of two important independent factors that influence behavior: expectation of success and subjective task value. The expectation of success is the belief that one will succeed in one's tasks. The subjective task value comprises attainment value, utility value, and cost.[29]

Regarding emotions, we defined six positive emotions as enthusiasm,

cheerfulness, optimism, contentedness, calmness, and relaxation, and negative emotions were tension, gloominess, depression, worry, miserableness, and uneasiness.[30] These frameworks were adopted to analyze the students' experiences and facilitate the interpretation of what their effects were on motivation and the mechanisms by which they operated. Using multiple theories encourages a deeper understanding of motivational principles.[27]

Researcher characteristics and reflexivity

As undergraduates, all researchers in this study were obligated students who then worked at rural medical institutions for nine years post-graduation. Currently, they engage in community medicine education and research at the university while practicing at rural medical institutions.

Additionally, YS and OM taught the research participants. Their hierarchical relationship[34] could have resulted in the social desirability bias whereby students are motivated to respond in ways they think may be desirable to their teachers.[35] To address this problem, some research processes, such as requesting student participation, collecting data, and writing the transcripts, were done only by YS. Although YS is a faculty member, YS has not been involved in the judgment of academic achievement and promotion of

participating students. The co-researcher (OM) has been involved in the judgment of students, so he joined the analysis after students' personal identity information was deleted. We communicated this to the students and made an effort to create an atmosphere where they could relax and respond freely. The other co-researchers (TT and KT) were not involved in the research processes described above.

Research context

Kobe University *Chiikiwaku*

This research was conducted at Kobe University. Candidates who want to join Kobe University's *chiikiwaku* program must receive recommendations from graduate high schools and then take the specific entrance examination. They can only apply to the program before admission. After admission, they receive scholarships from the Hyogo prefectural government, which is responsible for securing medical care in Hyogo prefecture's rural areas. They have the obligation to work for nine years post-graduation at rural medical institutions assigned by the prefectural government. These systems are common throughout Japan, with some differences. *Chiikiwaku* students comprise about 10% of all Kobe University medical students.

Kobe University CBME

All pre-clinical students, including *chiikiwaku* students, attend university CH lectures, programs at nursing care facilities, and special needs schools. During their clinical years, they are exposed to home care, and a community-based clerkship program for about two weeks or one month is available. Additionally, certain special programs are provided mainly for *chiikiwaku* students: a two-day early exposure program in rural community clinics, a three-day summer program in rural medical institutions, and a health education program for the elderly in rural areas.

Participants

We used purposive sampling[36] in order to focus on the mechanisms through which *chiikiwaku* students maintained and improved their motivation for practicing CH. We recruited fifth- or sixth-year *chiikiwaku* students at Kobe University as research participants. We selected fifth- or sixth-year students (i.e., students in their clinical years) to effectively collect rich experiences related to CH. There were 19 *chiikiwaku* students who satisfied the selection criteria. We could not predetermine the required sample size. However, using rough rules of thumb, it was judged that 12 to 26 participants could be considered appropriate,[37] and so we estimated that it would be possible to carry out the

research using the selected criteria. We continued sampling until obtaining saturation, i.e., no further themes or constructs could be identified in the analysis.[38]

As a practical procedure, the first author (YS) emailed the first participant who was randomly selected from the target groups that satisfied the selection criteria; then, if this student expressed an interest in participating, they were informed of the details in person and gave their written informed consent. After collecting and analyzing their data, YS contacted the next participant in a similar manner.

Data collection

We chose individual, in-depth, semi-structured interviews that allowed us to delve deeply into interviewees' experiences in order to acquire concrete descriptions.[25] Before the interviews, we prepared the interview guide, including eight questions based on the students' past practical CH-related experiences (see Supplemental Appendix). This guide was used as a pilot guide and was intended to be revised as the study progressed; in the end it was not revised because a sufficient quantity of descriptions by interviewees was attained. YS interviewed all study participants from September to December 2018. Each interview lasted about 60 minutes and was audio-recorded and then transcribed by YS.

There were 19 fifth- or sixth-year *chiikiwaku* students (female = 10, male = 9) at

Kobe University. Everyone who received the request kindly agreed to participate. Finally, a total of 14 students (73.7%; female = 9, male = 5) participated (i.e., theoretical saturation was reached after 14 students had been interviewed, at which point the interviews were concluded). Participants' median (inter-quartile range) age was 23 (23–24); half were fifth-year and the other half sixth-year students. Five participants subjectively recognized their hometown as rural and nine as urban.

Data analysis

The transcripts were analyzed following the "Steps for Coding and Theorization" (SCAT) method, which is a grounded theory-inspired thematic analytical approach.[39] SCAT consists of a four-step coding process. As a preliminary preparation, the text of the transcript is segmented properly on a per-speech basis. Then, (1) determining focused words from the segmented text: identifying the important words (codes) from the segmented text. (2) Determining words that can replace the words in step (1) with words external to the text: writing other codes that represent the meanings of the codes in step (1). (3) Determining words that explain the words in steps (1) and (2): writing other codes that can explain the codes in step (1) and (2) while considering the context of the entire

data. (4) Creating themes and constructs: reading the product of steps (1) to (3) carefully and drawing out new themes and constructs.

The next step is writing a story line, which was defined by Otani as a "description of the latent meanings of the events described in the data by piecing the themes mainly described in step (4)." Through the process of decontextualizing and recontextualizing the data, the "deep context" of the data can be obtained from their "surface context." Finally, theories are generated by fragmenting the story line to discover new theories. According to Otani, the theories identified in this process are "not something that is universal and generally accepted, but what can be said from this data."

To facilitate an understanding of the analysis process of SCAT, Otani described practical examples[39] using the text from Akatsu[40]: "Auscultation of Heart Sounds Taught by Body." We summarized and introduced one part of the analysis process. The fragmented data were "*The professor began to undress on the platform. Everyone was taken aback. Then, on his chest, an image of heart and blood vessels appeared. Everyone cheered and applauded.*" Step (1): he focused on "*professor*," "image of *heart and blood vessels appeared*," and "*cheered and applauded*." Step (2): he replaced each word to "*authoritative teacher*," "o*verlaying reality with teaching materials*," "*surprise teaching material presentation*," and "*students' surprise and pleasure.*" Step (3): he determined

the words "*superimposition of real body and picture*" and "*element of surprise"* Step (4): he created the themes and constructs of "*modeling reality*," "*layer presentation of reality and teaching materials*," and "extracting *motivation and expectations based on surprise.*" Writing a story line: he wrote that "*this professor turned his body into a type of teaching material in a surprising way and realized a learning process that included surprises.*" Generating theory: he generated the theories "*the use of one's body in medical education can leave a strong impression on learners.*"

As such, we have described the final themes by organizing the theories that emerged through analysis. The process of going back and forth between steps (1) and (4) and reading them repeatedly improves the quality and depth of the analyst's reflection. Furthermore, the explicit description of the analytic process allowed the readers to falsify the result. These analysis processes were all done in Excel 2013 (Microsoft Corporation, Redmond, WA, USA). We chose this approach for its usability, process explicitness, and improved reflectability and falsifiability.

YS analyzed the data in each step, and a co-researcher (OM) reviewed the transcripts and analysis results.

Patient or public involvement

This research was conducted with partial participant involvement. Participants were not

invited to comment on the study design and methods. However, they were emailed their own transcripts and analysis results, and invited to comment on them. Four commented via email or face-to-face, and confirmed that there were no issues in the readability and accuracy of the transcripts and the results obtained from them. This process strengthened the overall credibility of the study.[36]

RESULTS

While exploring the details of what kind of experiences influence *chiikiwaku* students' motivation for practicing CH and the mechanisms of this influence, three mechanisms and corresponding experiences emerged as the final themes. First, envisioning and preparing for practicing CH (comprising corresponding experiences of empathy for the community, grasping the demands for CH, understanding the practices of CH, finding a role model, and diminishing the conflicts between personal life and career); second, belonging to a supportive community (comprising robust construction of students' community for CH and harmonization with community residents); and third, heuristics and biases (affect heuristic and framing effects). The corresponding experiences brought about the changes and influences described in the presented mechanism and had both a positive and negative impact on students' motivation toward CH, depending on the level

of fulfillment obtained through the experiences and whether students were able to accept them.

1. Envisioning and preparing for practicing CH

Chiikiwaku students envisioned and prepared for their future practice of CH through five experiences: "empathy for the community," "grasping the demands for CH," "understanding the practices of CH," "finding a role model," and "diminishing the conflicts between personal life and career."

1.1 Empathy for the community

Students generated empathy by comparing their own thoughts, living environments, and cultural backgrounds with those of community residents and healthcare professionals through community dialogues and experiences.

> I've been to many different areas…When I talk to local people, I can see their lives are not different from those in other areas. I think it's very important to listen to local people. (Student 5, male, rural)

This empathy results from the recognition that there is little difference between them. Even if there were some differences, they still felt empathy.

> In certain areas I've visited, I heard I couldn't survive without a car. As my parents don't have a car, I could never imagine a life in which a car is indispensable. I understood what such a life is like when I went there…It may be simply that different people have different lifestyles. (Student 6, female, urban)

This empathy created a sense of familiarity and security in the community and reduced psychological barriers to continuing to belong to the community in the future.

1.2 Grasping the demands of CH

Students saw that patients and their families appreciated healthcare professionals and directly experienced the community residents' expectations of the students. These experiences satisfied the needs of being evaluated by others, and evoked the willingness to commit to this demand in their future CH practice.

> Every individual I saw expressed gratitude to the doctor…It was a good experience. I'm not sure if this will be my life's work, but I thought it would be nice to commit to this kind of work for a certain period. (Student 14, female, urban)

> The residents were kind. I was impressed when they said to me, 'Please come

back.' This experience made me feel that doctors like us are in demand. (Student 13, male, rural)

Conversely, community residents' excessive expectations for students led to students' fears that they may not be able to fulfill them. This caused anxiety about future CH practices.

Of course, I would be glad…if I could actually save people's lives in the future. That being said, the pressure is too much, I wouldn't be able to do everything perfectly. Therefore… I feel it would be challenging. (Student 7, female, urban)

1.3 Understanding the practices of CH

Students understood CH practices such as holistic medical care, comprehensive care, home care, preventive care, and a community-oriented approach, then imagined their future practice. This experience enabled students to replace uncertainty about their own future practices with practical knowledge. Furthermore, if students were interested in these practices, the desire to practice these activities was stimulated.

It goes without saying that I want to do this job. These experiences are really

helpful in that I can now imagine how I would be working in the future. They were very effective opportunities because I could think about what I need to know. (Student 12, male, urban)

1.4 Finding a role model

If the students' role models' practices were deemed achievable for students in the future, their desire to emulate the role model was stimulated. This experience contributed to the formation of future self-images engaging in CH.

The doctor was really…the best... He can be an ideal role model. I'm grateful I had many opportunities to see the doctor thereafter. I listened to many of his stories. (Student 5, male, rural)

However, this was obstructed if the students thought the role models' abilities were beyond their own capacities. Their anxiety about carrying out unfeasible practices in the future was stimulated.

I really admire them. I think they're great. On the other hand, I'm not confident I can be like them… There are a lot of genuinely smart doctors and those who are passionate about CH. If I was asked if I have such a strong

passion, I don't have that much passion, so I'm worried if I can actually become a doctor like them. (Student 7, female, urban)

1.5 Diminishing the conflicts between personal life and career

Students felt a potential conflict between their imagined future private lives, including marriage and childcare, and their career ideals (e.g., attaining specialist certifications). Diminishing this conflict secured the autonomy of their future daily lives and career choices.

I felt that life events like marriage and having a child will inevitably weaken motivation. That's why, having listened to Dr. A., I'm glad her talk helped me figure out how I can overcome such challenges. (Student 4, female, urban)

Specialist physician…I have been worried constantly because I don't know what to do if I became interested in obtaining certification. I mean, I thought I would be far behind if I continued as a *chiikiwaku* physician. However, I've heard *chiikiwaku* physicians have been able to obtain specialist certification…. I appreciate this because I no longer have to be worried. (Student 4, female, urban)

2. Belonging to a supportive community

Robust construction of students' CH community and harmonization with community residents brought about a sense of belonging to a supportive community for *chiikiwaku* students.

2.1 Robust construction of students' CH community

The sense of belonging to the medical student community interested in CH was increased by constructing a robust community relationship.

> Listening to different views and expectations of CH helps increase motivation. This is because through such experiences, I can feel first-hand that I am part of a group of people who take CH seriously. (Student 12, male, urban)

On the other hand, critics of CH can decrease students' motivation. However, if the students' CH community functioned in a robust manner and students recognized their own sense of community belonging, then these conflicts might conversely strengthen their sense of belonging.

> From time to time, I came across a doctor who unshakably believes in specialists. I didn't enjoy listening to such a doctor … I would have a myopic

> view if I constantly listened to people who keep on saying that community physicians are better. I would rather like to say I have seen that side and I dare to have chosen this side. At that time, I felt uncomfortable. Though, in hindsight, that experience helped me choose the right path. (Student 1, female, urban)

Furthermore, the community support system made students feel secure. In this regard, students' affinity with the community of medical doctors had an interesting role. For some *chiikiwaku* students, their relationships with the local government's administrative department that has the authority to decide their future working location was perceived as an employee–employer relationship. However, when students realized there were doctors in the administrative department and that these doctors were involved in supporting their careers, the feeling of an employee–employer relationship was eased, and their feeling of autonomy regarding career choice was secured.

> As the government always tells us where to go, I've been feeling that I'm made to work for them. As I didn't know that certain doctors are working as government officers, I was thinking that those who don't know much about what doctors do are unilaterally deciding what we should do. It was valuable

> to learn that the government includes those who understand doctors' work and that such people care about our careers and are trying to develop a system in which we can have equal opportunities. (Student 1, female, urban)

2.2 Harmonization with community residents

As newcomers, students felt anxious about creating relationships with the community residents. However, as students recognized that they were accepted into the community, the sense of belonging to the community of residents was engendered. Furthermore, community residents' dedication to CH and medical education evoked students' desires to contribute to the community.

> As I was very welcomed there, I would like to give back to them by working hard. …When they said, 'Is there anything to learn from us?' and 'I would be more than happy to help you if it would be beneficial,' I felt that I was given such valuable opportunities to learn. (Student 10, female, urban)

3. Heuristics and biases

Heuristics and biases, namely the affect heuristic and framing effect, stimulated students' motivation to contribute to CH, by improving their conceptual image of CH.

3.1 Affect heuristic

This is an heuristic in which positive or negative emotions affect the judgment of things quickly and automatically.[41] CBME elements such as unique experiences in the community, interaction with others, enjoyable and relaxed practice environments, acquisition of fresh knowledge and skills, and finding a role model induced enjoyable, happy, and positive feelings in students. These positive feelings elicited the affect heuristic, impacting their conceptual image of CH.

> For clinical clerkship in university, for example, I have to take training seriously, but the summer program was rather fun, a more harmonious training and hence was quite interesting. (Student 5, male, rural)

3.2 Framing effect

This is a cognitive bias in which a positive or negative presentation of something creates a decision-making bias.[42] Showing that CH professionals had an enjoyable work life and lifestyle, and describing how rewarding CH can be to students created a framing effect that CH was worthwhile. This affected students' conceptual image of CH.

> All doctors look happy there. Every time I go there, I'm reminded they all enjoy working there. Every doctor is thriving there. (Student 4, female, urban)

DISCUSSION

We explored what kind of experiences influence *chiikiwaku* students' motivation for practicing CH and the mechanism of this influence. Three mechanisms and corresponding experiences emerged: (1) envisioning and preparing for practicing CH (namely empathy for the community, grasping the demands for CH, understanding the practices of CH, finding a role model, and diminishing the conflicts between personal life and career), (2) belonging to a supportive community (namely robust construction of students' CH community and harmonization with community residents), and (3) heuristics and biases (namely the affect heuristic and framing effect). The corresponding experiences brought about the changes and influences on the students described in the presented mechanisms, and motivated them to practice CH.

To more deeply interpret the process of how these experiences motivate students, a theoretical framework was used, looking at internal motives such as student needs, cognitions, and emotions, and subordinate guiding theories that explain them in detail. We will now go through the various experiences and mechanisms and discuss their connections to the theoretical framework.

The first mechanism, envisioning and preparing for practicing CH, strengthens the expectation of success and subjective task value through self-images of future CH

practice (cognitive motives). In addition, each experience that led to envisioning and preparing for practicing CH also included other motivating factors for students. Empathy for the community brings positive emotions such as optimism, calmness, and relaxation from familiarity and security (emotional motives). Furthermore, deeper knowledge of the region can increase expectation of success in living and practicing CH in the region (cognitive motives). With regard to grasping the demands for CH, students can recognize the importance of CH from the gratitude shown to healthcare professionals and the expectations of the students expressed by community residents and patients. This experience makes students recognize the task value of CH (cognitive motives). Furthermore, the regulation types proposed by SDT (see Methods) can also be used to interpret these experiences. This is an example of introjected regulation if their practice of CH is praised by others, and identified regulation which refers to the recognition that CH is important. Through these regulations, students' need for competence can be stimulated (needs motives). On the other hand, excessive expectations cause negative emotions for students (i.e., anxiety), who fear that they may not meet the expectations of residents and patients, and reduce their expectation of success (emotional and cognitive motives). With regard to finding a role model, if a student's expectation that they can become like their role model increases, their need for competence is stimulated; by

contrast, if the expectation of success decreases, the need for competence is stifled (cognitive and need motives). Additionally, finding a role model evokes a positive emotion arising from the desire to be like the role model: enthusiasm. This positive emotion could bring more internalized regulation, specifically integrated regulation, which integrates the identification of the value of CH and students' self-beliefs, or intrinsic regulation related to students' strong interests (emotional and needs motives). With regard to diminishing the conflicts between personal life and career, knowing how physicians practicing CH deal with these conflicts can increase the expectation of success (cognitive motives). This would secure their need for autonomy in their daily lives and career choices (needs motives). Moreover, confirmation of autonomy brings about a shift from negative (worry) to positive emotions (calmness; emotional motives).

With reference to the second mechanism, belonging to a supportive community satisfies students' relatedness needs (needs motives). In addition, regarding the robust construction of students' CH community, the fact that doctors working in the local government actively support students and reduce the sense of an employee-employer relationship brings positive emotions (calmness) for students, and secures their autonomy needs regarding their career choice (emotional and needs motives). With regard to harmonization with community residents, the active involvement of residents in student

education arouses the students' needs for competence, stimulating their desire to contribute to the community. This could also stimulate integrated regulation, which goes beyond simple praise or recognition of importance (needs motives).

Regarding the third main theme, the affect heuristic and framing effects induce improvements in the students' image of CH. Positive emotions (enthusiasm, cheerfulness, optimism, contentedness, calmness, and relaxation) are greatly involved in this (emotional motives). These positive emotions also promote intrinsic regulation, related to students' strong interests (needs motives).

In previous studies, broad practice scope,[43-46] general practice,[47] specialty,[43 45] clinical skill,[47] role models,[44 45 48 49] work satisfaction,[43 50] lifestyle,[44 45 47 51] exposure to different places,[50] rural rotation,[50] patient interaction,[47] and social network[48] have been listed as factors that increase the medical students' primary care and/or rural healthcare motivations. Our study's findings are consistent with these previous findings. For example, broad practice scope, general practice, specialty, clinical skill and work satisfaction would be included in understanding the practices of CH; lifestyle would be included in diminishing the conflicts between personal life and career; exposure to different places, rural rotation, and patient interaction would be included in empathy for the community, grasping the demands for CH, and harmonization with community

residents; and finally social network would be included in robust construction of students' CH community and harmonization with community residents. However, the novel significance of our study is that it includes detailed descriptions of how these factors (experiences) affected students' motivation and interprets the results through the lenses of multi-faceted motivation theories. In addition, importantly, the influence of heuristics and biases on students' motivation was suggested.

Lessons for CBME programming

How should our results be used when designing and reconstructing CBME programs so as to effectively foster students' motivation to become involved in CH? We suggest five possible approaches.

First, there should be many opportunities to interact with community residents as well as patients. By interacting with them, students can learn more about the community and the region, understand appreciation for and expectations of healthcare professionals and students, construct relationships with the community of residents, and have enjoyable experiences that they cannot otherwise gain by working in hospitals.

Second, patients and community residents should be asked to share their appreciation for healthcare professionals and health-related concerns with students.

Communicating gratitude and expectations to others is sometimes embarrassing. However, this is important for helping students easily grasp the demands of CH.

Third, healthcare professionals should provide positive messages to students about why they continue their work, how they feel rewarded, what they enjoy in work and life, and how to deal with conflicts between their private lives and careers. These make it easier for students to perceive healthcare professionals as role models, and facilitate the student's vision of their future CH practice. Furthermore, the framing effect improves the student's conceptual image of CH.

Fourth, there should be time for students to interact with each other and have an enjoyable leisure time. This would construct robust student relationships and generate pleasant memories, which would improve the students' conceptual image of CH through affect heuristics.

Fifth, there should be time to become familiar with the community environments and cultures. If these become enjoyable experiences for students, students would become attached to the community and region, have increased empathy for them, and their conceptual image of CH would again be improved through affect heuristics.

Incorporation of these items into CBME programs may encourage students to maintain and improve their motivation for practicing CH.

Limitations

There were three limitations in our study. First, this study focused on what kind of experiences influence *chiikiwaku* students' motivation for practicing CH, and the mechanism of this influence, and was not intended to provide reasons to motivate other students to participate in the *chiikiwaku* system or engage in CH. In order to increase the number of physicians engaged in CH, it is necessary to motivate not only *chiikiwaku* students but all other students as well. Further research targeting general students who have no CH obligations are needed.

Second, study participants were limited to *chiikiwaku* students from a single university. There are many variations in the *chiikiwaku* system, including selection methods, scholarship options, and working style after graduation, among others. *Chiikiwaku* doctors who graduate from Kobe University may work at small medical institutions in rural areas, but some *chiikiwaku* doctors who attended other universities may work after graduation at tertiary care medical institutions in the prefectures where their own universities were located. Thus, it is unclear whether all obligated students will be motivated to participate in CH through similar mechanisms. In this regard, further research targeting *chiikiwaku* students who belong to other universities is also needed.

Third, this study was conducted with students by their teachers. Thus, their

hierarchical relationship could be a problem.[34] To address this problem, we made various efforts as described in the Methods, however we cannot completely eliminate the social desirability bias.[35]

CONCLUSIONS

The *chiikiwaku* students developed a motivation to be involved in CH through self-images of their future CH practice and life (i.e., envisioning and preparing for practicing CH); constructing a robust student CH community and harmonizing with community residents (i.e., belonging to a supportive community); and experiences generating positive emotions that improve their conceptual image of CH (heuristics and biases). Many of these mechanisms are generated by positive interaction with community residents, healthcare professionals, and other students, and in exposure to attractive community environments and cultures. Thus, these experiences should be incorporated into CBME programs to further encourage students' positive attitudes toward CH.

ACKNOWLEDGEMENTS

The authors wish to thank Editage (www.editage.com) for English language editing.

COMPETING INTERESTS

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

FUNDING

This study was supported by Grants-in-Aid for Scientific Research from the Japan Society for the Promotion of Science (JSPS KAKENHI Grant Number JP16K08870).

ETHICAL APPROVAL

The Institutional Review Board of Kobe University Graduate School of Medicine approved this study on July 17, 2018 (number 180087).

CONTRIBUTORS

YS was chiefly responsible for the study design, acquisition, analysis, and interpretation of the data and drafting of the manuscript. OM contributed to the study design, analysis, and interpretation of the data, and a critical revision of the manuscript. TT and KT contributed to the study design and the critical revision of the manuscript. All of the authors approved the final version of the manuscript.

DATA AVAILABILITY STATEMENT

The data used and/or analyzed during the current study are available from the

corresponding author on reasonable request.

REFERENCES

1. Marengoni A, Angleman S, Melis R, et al. Aging with multimorbidity: a systematic review of the literature. *Ageing Res Rev* 2011;10(4):430-9. doi: 10.1016/j.arr.2011.03.003 [published Online First: 16 March 2011]

2. Tsutsui T. Implementation process and challenges for the community-based integrated care system in Japan. *Int J Integr Care* 2014;14:e002. doi: 10.5334/ijic.988 [published Online First: 31 January 2014]

3. World Health Organization Centre for Health Development (Kobe, Japan). *A glossary of terms for community health care and services for older persons. Kobe, Japan: World Health Organization Centre for Health Development.* 2004. https://apps.who.int/iris/handle/10665/68896 (accessed 3 April 2020).

4. Kainuma M, Kikukawa M, Nagata M, et al. Competencies necessary for becoming a leader in the field of community medicine: a Japanese qualitative interview study. *BMJ Open* 2018;8(4):e020082. doi: 10.1136/bmjopen-2017-020082 [published Online First: 19 April 2018]

5. World Health Organization. (ed.) *Increasing Access to Health Workers in Remote and*

Rural Areas Through Improved Retention: Global Policy Recommendations. Geneva, Switzerland: WHO Press, 2010.

6. Matsumoto M, Inoue K, Takeuchi K. Quality of care in Japan: an additional strategy. *Lancet* 2011;378(9807):e17. doi: 10.1016/S0140-6736(11)61841-2 [published Online First: 6 December 2011]

7. Kataoka Y, Takayashiki A, Sato M, et al. Japanese regional-quota medical students in their final year are less motivated to work in medically underserved areas than they were in their first year: a prospective observational study. *Rural Remote Health* 2018;18(4):4840. doi: 10.22605/RRH4840 [published Online First: 27 October 2018]

8. Matsumoto M, Takeuchi K, Owaki T, et al. Results of physician licence examination and scholarship contract compliance by the graduates of regional quotas in Japanese medical schools: a nationwide cross-sectional survey. *BMJ Open* 2017;7(12):e019418. doi: 10.1136/bmjopen-2017-019418 [published Online First: 25 December 2017]

9. Hearst N, Shore WB, Hudes ES, et al. Family practice bashing as perceived by students at a university medical center. *Fam Med* 1995;27(6):366-70. [published Online First: 1 June 1995]

10. Bowman MA, Haynes RA, Rivo ML, et al. Characteristics of medical students by level of interest in family practice. *Fam Med* 1996;28(10):713-9. [published Online First: 1 November 1996]

11. Barrett FA, Lipsky MS, Lutfiyya MN. The impact of rural training experiences on medical students: a critical review. *Acad Med* 2011;86(2):259-63. doi: 10.1097/ACM.0b013e3182046387 [published Online First: 21 December 2010]

12. Kelly L. (ed.) *Community-based medical education: a teacher's handbook.* Radcliffe Publishing: London, England, 2012.

13. Crampton PES, McLachlan JC, Illing JC. A systematic literature review of undergraduate clinical placements in underserved areas. *Med Educ* 2013;47(10):969-78. doi: 10.1111/medu.12215 [published Online First: 11 September 2013]

14. Lee SW, Clement N, Tang N, et al. The current provision of community-based teaching in UK medical schools: an online survey and systematic review. *BMJ Open* 2014;4(12):e005696. doi: 10.1136/bmjopen-2014-005696 [published Online First: 3 December 2014]

15. Laven G, Wilkinson D. Rural doctors and rural backgrounds: how strong is the evidence? A systematic review. *Aust J Rural Health* 2003;11(6):277-84. doi:

10.1111/j.1440-1584.2003.00534.x [published Online First: 18 December 2003]

16. Okayama M, Kajii E. Does community-based education increase students' motivation to practice community health care?--a cross sectional study. *BMC Med Educ* 2011;11:19. doi: 10.1186/1472-6920-11-19

17. Viscomi M, Larkins S, Gupta TS. Recruitment and retention of general practitioners in rural Canada and Australia: a review of the literature. *Can J Rural Med* 2013;18(1):13-23. [published Online First: 25 December 2012]

18. Pfarrwaller E, Sommer J, Chung C, et al. Impact of Interventions to Increase the Proportion of Medical Students Choosing a Primary Care Career: A Systematic Review. *J Gen Intern Med* 2015;30(9):1349-58. doi: 10.1007/s11606-015-3372-9 [published Online First: 16 July 2015]

19. Strasser R, Worley P, Cristobal F, et al. Putting communities in the driver's seat: the realities of community-engaged medical education. *Acad Med* 2015;90(11):1466-70. doi: 10.1097/acm.0000000000000765 [published Online First: 29 May 2015]

20. Budhathoki SS, Zwanikken PA, Pokharel PK, et al. Factors influencing medical students' motivation to practise in rural areas in low-income and middle-income countries: a systematic review. *BMJ Open* 2017;7(2):e013501. doi: 10.1136/bmjopen-2016-013501 [published Online First: 25 February 2017]

21. Johnson GE, Wright FC, Foster K. The impact of rural outreach programs on medical students' future rural intentions and working locations: a systematic review. *BMC Med Educ* 2018;18(1):196. doi: 10.1186/s12909-018-1287-y [published Online First: 16 August 2018]

22. Crampton PES. *Medical student learning during longitudinal clinical placements in under-served, deprived, community areas: A qualitative study.* Doctoral theses. Durham University; 2015.

23. Dube TV, Schinke RJ, Strasser R, et al. Transition processes through a longitudinal integrated clerkship: a qualitative study of medical students' experiences. *Med Educ* 2015;49(10):1028-37. doi: 10.1111/medu.12797 [published Online First: 19 September 2015]

24. O'Brien BC, Harris IB, Beckman TJ, et al. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* 2014;89(9):1245-51. doi: 10.1097/acm.0000000000000388 [published Online First: 1 July 2014]

25. Denzin NK, Lincoln YS. *The SAGE Handbook of Qualitative Research.* 5th ed. Thousand Oaks, CA: SAGE Publications; 2017.

26. Reeve J. *Understanding Motivation and Emotion*. 7th ed. Hoboken, NJ: John Wiley & Sons; 2018.

27. Cook DA, Artino AR, Jr. Motivation to learn: an overview of contemporary theories. *Med Educ* 2016;50(10):997-1014. doi: 10.1111/medu.13074

28. Deci EL, Ryan RM. The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychol Inq* 2000;11(4):227-68. doi: 10.1207/S15327965PLI1104_01

29. Wigfield A, Eccles JS. Expectancy-Value Theory of Achievement Motivation. *Contemp Educ Psychol* 2000;25(1):68-81. doi: 10.1006/ceps.1999.1015 [published Online First: 6 January 2000]

30. Vandercammen L, Hofmans J, Theuns P. Relating specific emotions to intrinsic motivation: on the moderating role of positive and negative emotion differentiation. *PloS One* 2014;9(12):e115396-e96. doi: 10.1371/journal.pone.0115396

31. Ten Cate TJ, Kusurkar RA, Williams GC. How self-determination theory can assist our understanding of the teaching and learning processes in medical education. AMEE guide No. 59. *Med Teach* 2011;33(12):961-73. doi: 10.3109/0142159x.2011.595435 [published Online First: 10 January 2012]

32. Kusurkar RA, Croiset G, Mann KV, et al. Have motivation theories guided the development and reform of medical education curricula? A review of the literature.

Acad Med 2012;87(6):735-43. doi: 10.1097/ACM.0b013e318253cc0e [published Online First: 27 April 2012]

33. Orsini C, Binnie VI, Wilson SL. Determinants and outcomes of motivation in health professions education: a systematic review based on self-determination theory. *J Educ Eval Health Prof* 2016;13:19-19. doi: 10.3352/jeehp.2016.13.19

34. Boet S, Sharma S, Goldman J, et al. Review article: medical education research: an overview of methods. *Can J Anaesth* 2012;59(2):159-70. doi: 10.1007/s12630-011-9635-y [published Online First: 5 January 2012]

35. Nederhof AJ. Methods of coping with social desirability bias: A review. *Eur J Soc Psychol* 1985;15(3):263-80. doi: 10.1002/ejsp.2420150303

36. Polit DF, Beck CT. *Nursing Research: Principles and Methods.* 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2004.

37. Luborsky MR, Rubinstein RL. Sampling in Qualitative Research: Rationale, Issues, and Methods. *Res Aging* 1995;17(1):89-113. doi: 10.1177/0164027595171005

38. Saunders B, Sim J, Kingstone T, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant* 2018;52(4):1893-907. doi: 10.1007/s11135-017-0574-8 [published Online First: 14 September 2017]

39. Otani T. "SCAT" A qualitative data analysis method by four-step coding: Easy

startable and small scale data-applicable process of theorization. *Bulletin of the Graduate School of Education and Human Development (Educational Sciences), Nagoya University* 2007;54:27-44 (In Japanese with English abstract).

40. Akatsu H. *American Medical Education-Diary in Ivy League Medical School*. Tokyo, Japan: Nippon hyoron sha; 1996 (in Japanese).

41. Finucane ML, Alhakami A, Slovic P, et al. The affect heuristic in judgments of risks and benefits. *J Behav Decis Mak* 2000;13(1):1-17. doi: 10.1002/(sici)1099-0771(200001/03)13:1<1::Aid-bdm333>3.0.Co;2-s

42. Tversky A, Kahneman D. The framing of decisions and the psychology of choice. *Science* 1981;211(4481):453-58. doi: 10.1126/science.7455683

43. Dixon AS, Lam CL, Lam TP. Does a brief clerkship change Hong Kong medical students' ideas about general practice? *Med Educ* 2000;34(5):339-47. [published Online First: 12 April 2000]

44. Jordan J, Brown JB, Russell G. Choosing family medicine. What influences medical students? *Can Fam Physician* 2003;49:1131-7. [published Online First: 7 October 2003]

45. Scott I, Wright B, Brenneis F, et al. Why would I choose a career in family medicine?: Reflections of medical students at 3 universities. *Can Fam Physician*

2007;53(11):1956-7. [published Online First: 15 November 2007]

46. Ohta R, Ryu Y, Katsube T, et al. Students' perceptions of general medicine following community-based medical education in rural Japan. *J Gen Fam Med* 2019;20(6):236-43. doi: 10.1002/jgf2.274

47. Stagg P, Greenhill J, Worley PS. A new model to understand the career choice and practice location decisions of medical graduates. *Rural Remote Health* 2009;9(4):1245. [published Online First: 1 December 2009]

48. Roberts C, Daly M, Kumar K, et al. A longitudinal integrated placement and medical students' intentions to practise rurally. *Med Educ* 2012;46(2):179-91. doi: 10.1111/j.1365-2923.2011.04102.x [published Online First: 14 January 2012]

49. Kawamoto R, Uemoto A, Ninomiya D, et al. Characteristics of Japanese medical students associated with their intention for rural practice. *Rural Remote Health* 2015;15(2):3112. [published Online First: 13 June 2015]

50. Codsi MP, Rodrigue R, Authier M, et al. Family medicine rotations and medical students' intention to pursue family medicine: Descriptive study. *Can Fam Physician* 2019;65(7):e316-e20. [published Online First: 14 July 2019]51. Birden HH, Wilson I. Rural placements are effective for teaching medicine in Australia: evaluation of a cohort of students studying in rural placements. *Rural Remote*

Health 2012;12:2167. [published Online First: 2012/11/20]

51. Birden HH, Wilson I. Rural placements are effective for teaching medicine in Australia: evaluation of a cohort of students studying in rural placements. *Rural Remote Health* 2012;12:2167. [published Online First: 20 November 2012]

Supplemental appendix. Interview guide used in the study.

1. What do you think about community healthcare (CH)?
2. Why do you think so?
3. What were the events that affected your perception about CH?
4. How did the events affect your perception about CH?
5. How does the experience of home care affect your perception about CH?
6. How does the experience of day care/service affect your perception about CH?
7. How does the experience of health education for local residents affect your perception about CH?
8. How does the experience in the rural area affect your perception about CH?

Reporting checklist for qualitative study.

Based on the SRQR guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SRQRreporting guidelines, and cite them as:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014;89(9):1245-1251.

	Reporting Item	Page Number
Title		
#1	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	1

Abstract			
	#2	Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2-3
Introduction			
Problem formulation	#3	Description and signifcance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	4-6
Purpose or research question	#4	Purpose of the study and specific objectives or questions	6
Methods			
Qualitative approach and research paradigm	#5	Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenolgy, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability.	6-9

		As appropriate the rationale for several items might be discussed together.	
Researcher characteristics and reflexivity	#6	Researchers' characteristics that may influence the research, including personal attributes, qualifications / experience, relationship with participants, assumptions and / or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and / or transferability	9-10
Context	#7	Setting / site and salient contextual factors; rationale	10-11
Sampling strategy	#8	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g. sampling saturation); rationale	11-12
Ethical issues pertaining to human subjects	#9	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	12, 34
Data collection methods	#10	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources / methods, and modification of procedures in response to evolving study findings; rationale	12-13

Data collection instruments and technologies	#11	Description of instruments (e.g. interview guides, questionnaires) and devices (e.g. audio recorders) used for data collection; if / how the instruments(s) changed over the course of the study	12
Units of study	#12	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	12-13
Data processing	#13	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymisation / deidentification of excerpts	12
Data analysis	#14	Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	13-15
Techniques to enhance trustworthiness	#15	Techniques to enhance trustworthiness and credibility of data analysis (e.g. member checking, audit trail, triangulation); rationale	15-16
Results/findings			
Syntheses and interpretation	#16	Main findings (e.g. interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	16-17

Links to empirical data	#17	Evidence (e.g. quotes, field notes, text excerpts, photographs) to substantiate analytic findings	17-25
Discussion			
Intergration with prior work, implications, transferability and contribution(s) to the field	#18	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application / generalizability; identification of unique contributions(s) to scholarship in a discipline or field	26-31
Limitations	#19	Trustworthiness and limitations of findings	32-33
Other			
Conflicts of interest	#20	Potential sources of influence of perceived influence on study conduct and conclusions; how these were managed	34
Funding	#21	Sources of funding and other support; role of funders in data collection, interpretation and reporting	34

BMJ Open

Fostering Student Motivation toward Community Healthcare: A Qualitative Study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-039344.R2
Article Type:	Original research
Date Submitted by the Author:	18-Nov-2020
Complete List of Authors:	Yahata, Shinsuke; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Medical Education Takeshima, Taro; Fukushima Medical University, Department of General Medicine, Shirakawa Satellite for Teaching and Research (STAR); Fukushima Medical University, Center for Innovative Research for Communities and Clinical Excellence (CIRC2LE) Kenzaka, Tsuneaki; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Career Development Okayama, Masanobu; Kobe University Graduate School of Medicine School of Medicine, Division of Community Medicine and Medical Education
Primary Subject Heading:	Medical education and training
Secondary Subject Heading:	General practice / Family practice
Keywords:	MEDICAL EDUCATION & TRAINING, PRIMARY CARE, QUALITATIVE RESEARCH

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

Fostering Student Motivation toward Community Healthcare: A Qualitative Study

Words: 5243

Shinsuke Yahata[1], Taro Takeshima[2], Tsuneaki Kenzaka[3], and Masanobu Okayama[1]

[1]Division of Community Medicine and Medical Education, Kobe University Graduate School of Medicine, Kobe, Japan.

[2]Department of General Medicine, Shirakawa Satellite for Teaching and Research (STAR), Fukushima Medical University, Fukushima, Japan, and the Center for Innovative Research for Communities and Clinical Excellence (CIRC2LE), Fukushima Medical University, Fukushima, Japan.

[3]Division of Community Medicine and Career Development, Kobe University Graduate School of Medicine, Kobe, Japan.

Correspondence: Shinsuke Yahata, Division of Community Medicine and Medical Education, Kobe University Graduate School of Medicine, 2-1-5, Arata-cho, Hyogo-ku, Kobe, Hyogo, 652-0032, Japan; telephone: +81-78-382-6732; e-mail: yahata-jci@umin.ac.jp.

Keywords: community healthcare, community-based medical education, self-determination theory, expectancy-value theories, emotions

ABSTRACT

Objectives: This study investigated what kinds of experiences influence regional quota (*chiikiwaku*) medical students' motivation to practice community healthcare (CH), and the mechanism of this influence, by focusing on their experiences in a community-based medical education (CBME) program.

Design: A qualitative thematic analysis based on interviews.

Setting: Participants were recruited from the *chiikiwaku* students of Kobe University, Japan, using purposive sampling.

Participants: Fourteen students participated. The median (inter-quartile range) age of participants was 23 (23-24); half were sixth-year and half fifth-year students.

Analysis: From September to December 2018, the interviews were audio-recorded and transcribed verbatim. Data were analyzed according to the "Steps for Coding and Theorization" method. Our theoretical framework comprised three internal motives (i.e., needs, cognitions, and emotions) and their subordinate motivation theories self-determination theory, expectancy-value theories, and positive and negative emotions, respectively.

Results: Three mechanisms and corresponding experiences emerged. The first mechanism, envisioning and preparing for practicing CH, included corresponding experiences—empathy for the community, grasping the demands of CH, understanding the practices of CH, finding a role model, and diminishing the conflicts between personal life and career. The second mechanism, belonging to a supportive community, included the robust construction of students' CH community and harmonization with community residents. The third mechanism, psychological effects, included the affect heuristic and framing effect. Student experiences brought about the changes and influences described in the presented mechanisms, and had both positive and negative impacts on their motivation toward CH. These results can be interpreted through the multifaceted lenses of motivation theories.

Conclusions: The authors revealed that motivation mechanisms of medical students towards CH derived from positive interaction with community residents, healthcare professionals, and other students, and from exposure to attractive community environments and cultures. These experiences should be incorporated into CBME programs to further encourage positive attitudes toward CH.

Strengths and limitations of this study

- This study describes the motivation mechanisms of medical students toward practicing community healthcare.
- It is unclear whether all medical students will be motivated to participate in community healthcare through similar mechanisms since the study focuses on a specific group of participants.
- Social desirability bias occurring through the relationship between teachers and students cannot be completely eliminated.

INTRODUCTION

Elderly patients with multimorbidity or irremediable diseases have been increasing in number as global populations age.[1] Thus, the healthcare paradigm has shifted from conventional medical care, which cures diseases at hospitals, to community-based integrated care, which supports patients in the community.[2] These social contexts demand nurturing healthcare professionals with insights into the concept of community healthcare (CH), defined as the integration of health services and social care in the community,[3] who can effectively manage integrated care systems.[4]

Furthermore, the uneven distribution of physician manpower is a serious global

problem. The World Health Organization published global policy recommendations regarding access to health workers,[5] which several countries have adopted to confront this challenge. The Japanese government has implemented a regional quota system (*chiikiwaku*) to manage this problem.[6] *Chiikiwaku* allows medical students to receive prior benefits (e.g., special entrance qualifications and scholarships) on the condition they work for a specified medical institution (especially in rural areas) for a certain period after graduation, during which they are required to practice CH. In other words, they are required to become professionals who properly manage integrated care and compensate for the uneven distribution of doctors. However, it has been reported that the willingness of *chiikiwaku* students to remain in medically underserved areas declines from 52.3% to 19.2% during their studies.[7] Withdrawal from the *chiikiwaku* system, which was reported to be about 10%, is also a problem.[8] Moreover, the preference for a primary care career, which is necessary for practicing CH, may decrease during medical school.[9 10] Therefore, it is necessary to continuously encourage *chiikiwaku* students, while they are undergraduates, to maintain and improve their motivation for practicing CH.

Numerous studies have demonstrated that community-based medical education (CBME) programs, which have been implemented worldwide, improve CH skills[11-14] and increase motivation toward CH, primary care, and rural practice.[11 13-21] However,

although the overall effectiveness of these programs has been evaluated, and some educational components have been described,[22 23] the knowledge of mechanisms that motivate students to participate in CH is insufficient. Elucidating these mechanisms can provide significant insights for designing and reconstructing CBME programs to nurture future CH physicians. As such, our research objective is to investigate what kind of experiences influenced chiikiwaku students motivation for practicing CH in CBME programs and the mechanisms of this influence.

METHODS

Qualitative approach and research paradigm

We conducted a qualitative thematic analysis using interview data. The Standards for Reporting Qualitative Research (SRQR)[24] were adopted for the presentation of our research. We chose the constructivism paradigm to interpret and understand the meanings of students' experiences.[25] The constructivism paradigm asserts that people construct their understanding and knowledge of the world through experience and reflection on those experiences.

To interpret how students' experiences influenced their motivation for practicing CH, we used motivation theories as theoretical framework. There are numerous

motivation theories; however some confusion has arisen because of their conceptual overlaps and disagreements.[26] In other words, there is no one theory that can absolutely explain human motivations. We chose to use Reeve's concept of three internal motives.[27] Reeve defines "motivation" as "a condition inside us that desires a change" and proposes three internal motives for action: needs, cognitions, and emotions. We considered "student motivation toward CH" as "a condition inside students that they desire to practice CH" and adopted these three internal motives as a framework. In addition, in order to explain the three internal motives in detail, we used self-determination theory (SDT),[28] expectancy-value theories (EVT),[29], and positive and negative emotions[30] as subordinate guiding theories. We chose SDT and EVT because they are current, widely recognized theories.[27] [31-33] Emotions have been characterized as feeling-arousal-purposive-expressive phenomena, whose components cooperate in a complicated manner and allow us to react adaptively to the important events in our lives.[26] For the purposes of our study, in order to express them more simply, we adopted six positive and six negative emotions.[30]

SDT, which is involved in needs, comprises three basic psychological needs: autonomy, competence, and relatedness.[28] The need for autonomy is a tendency to self-organize experiences and behaviors. The need for competence refers to a desire to affect

the environment and attain valued outcomes. Finally, the need for relatedness is a tendency to love and care for and be loved and cared for by others. SDT also classifies the regulation types related to motivation: external, introjected, identified, integrated, and intrinsic regulations.[28] External regulation refers to the act of being controlled by external contingencies such as rewards or punishments. Introjected regulation refers to avoiding guilt or raising self-esteem by internalizing external pressures. Identified regulation derives from the recognition and acceptance of the behavior's importance. Integrated regulation refers to the act of integrating external identifications into other aspects of the self. In intrinsic regulation, the act itself becomes the purpose with a strong motivation. This regulation type leads to the most autonomous motivation.

EVT, which is involved in cognitions, consists of two important independent factors that influence behavior: expectation of success and subjective task value. The expectation of success is the belief that one will succeed in one's tasks. The subjective task value comprises attainment value, utility value, and cost.[29]

Regarding emotions, we defined six positive emotions as enthusiasm, cheerfulness, optimism, contentedness, calmness, and relaxation, and negative emotions were tension, gloominess, depression, worry, miserableness, and uneasiness.[30] These frameworks were adopted to analyze the students' experiences and facilitate the

interpretation of what their effects were on motivation and the mechanisms by which they operated. Using multiple theories encourages a deeper understanding of motivational principles.[27]

Researcher characteristics and reflexivity

As undergraduates, all researchers in this study were obligated students who then worked at rural medical institutions for nine years post-graduation. Currently, they engage in community medicine education and research at the university while practicing at rural medical institutions.

Additionally, YS and OM taught the research participants. Their hierarchical relationship[34] could have resulted in the social desirability bias whereby students are motivated to respond in ways they think may be desirable to their teachers.[35] To address this problem, requesting student participation, collecting data, and writing the transcripts were done only by YS. Although YS is a faculty member, YS has not been involved in the judgment of academic achievement and promotion of participating students. The co-researcher (OM) has been involved in the judgment of students, so he joined the analysis after students' personal identity information was deleted. We communicated this to the students and made an effort to create an atmosphere where they could relax and respond

freely. The other co-researchers (TT and KT) were not involved in the research processes described above.

Research context

Kobe University *Chiikiwaku*

This research was conducted at Kobe University. Candidates who want to join Kobe University's *chiikiwaku* program must receive recommendations from graduate high schools and then take the specific entrance examination. They can only apply to the program before admission. After admission, they receive scholarships from the Hyogo prefectural government, which is responsible for securing medical care in Hyogo prefecture's rural areas. They have the obligation to work for nine years post-graduation at rural medical institutions assigned by the prefectural government. These systems are common throughout Japan, with some differences. *Chiikiwaku* students comprise about 10% of all Kobe University medical students.

Kobe University CBME

All pre-clinical students, including *chiikiwaku* students, attend university CH lectures, programs at nursing care facilities, and special needs schools. During their clinical years, they are exposed to home care, and a community-based clerkship program for about two

weeks or one month is available. Additionally, certain special programs are provided mainly for *chiikiwaku* students: a two-day early exposure program in rural community clinics, a three-day summer program in rural medical institutions, and a health education program for the elderly in rural areas.

Participants

We used purposive sampling[36] in order to focus on the mechanisms through which *chiikiwaku* students maintained and improved their motivation for practicing CH. We recruited fifth- or sixth-year *chiikiwaku* students at Kobe University as research participants. We selected fifth- or sixth-year students (i.e., students in their clinical years) to effectively collect rich experiences related to CH. There were 19 *chiikiwaku* students who satisfied the selection criteria. We continued sampling until obtaining saturation, i.e., no further themes or constructs could be identified in the analysis.[37]

The first author (YS) emailed the first participant selected from the target groups that satisfied the selection criteria; then, if this student expressed an interest in participating, they were informed of the details in person and gave their written informed consent. After collecting and analyzing their data, YS contacted the next participant in a similar manner.

Data collection

We chose individual, in-depth, semi-structured interviews that allowed us to delve deeply into interviewees' experiences in order to acquire rich descriptions.[25] Before the interviews, we prepared the interview guide, including eight questions based on the students' past practical CH-related experiences (see Supplemental Appendix). The guide was intended to be revised but it was not necessary because of sufficient data. YS interviewed all study participants from September to December 2018. Each interview lasted about 60 minutes and was audio-recorded and then transcribed by YS.

There were 19 fifth- or sixth-year *chiikiwaku* students (female = 10, male = 9) at Kobe University. Everyone who received the request kindly agreed to participate. Finally, a total of 14 students (73.7%; female = 9, male = 5) participated (i.e., saturation was reached after 14 students had been interviewed, at which point the interviews were concluded). Participants' median (inter-quartile range) age was 23 (23–24); half were fifth-year and the other half sixth-year students. Five participants subjectively recognized their hometown as rural and nine as urban.

Data analysis

The transcripts were analyzed following the "Steps for Coding and Theorization" (SCAT) method, which is a grounded theory-inspired thematic analytical approach.[38 39] SCAT consists of a four-step coding process. In the following, we describe the analytical approach by using examples provided by Otani p. 36.[38] As a preliminary preparation, the text transcripts are segmented into fragmented data: *"The professor began to undress on the platform. Everyone was taken aback. Then, on his chest, an image of heart and blood vessels appeared. Everyone cheered and applauded."* In step 1, important words from the segmented text are extracted: *"professor," "image of heart and blood vessels appeared,"* and *"cheered and applauded."* Step 2 consists of replacing the extracted word with operationalized words that represent the meaning extracts from step 1: *"authoritative teacher," "overlaying reality with teaching materials," "surprise teaching material presentation,"* and *"students' surprise and pleasure."* In step 3, words from step 1&2 are operationalized into codes representative for the context of the entire data: *"superimposition of real body and picture"* and *"element of surprise."* Step 4 consists of creating themes and constructs; *"modeling reality," "layer presentation of reality and teaching materials,"* and *"extracting motivation and expectations based on surprise."* Lastly, a storyline defined as latent meaning based on the themes from step 4,

are written: *"this professor turned his body into a type of teaching material in a surprising way and realized a learning process that included surprises."* Finally, theories are generated based on the storyline: *"the use of one's body in medical education can leave a strong impression on learners."* Otani p. 159[39] emphasize that the theories generated are *"not something that is universal and generally accepted, but what can be said from this data."*

The final themes were described by organizing the theories that emerged through analysis. Otani stated that the characteristics of SCAT were as follows. The process of going back and forth between steps (1) and (4) and reading them repeatedly improves the quality and depth of the analyst's reflection, i.e. improves reflexivity. Furthermore, the explicit description of the analytic process allowed the readers to replicate the result and disprove any errors, i.e. improves falsifiability.[38] We chose this approach for its usability, process explicitness, and improved reflexivity and falsifiability. These analysis processes were all done in Excel 2013 (Microsoft Corporation, Redmond, WA, USA).

YS analyzed the data in each step, and a co-researcher (OM) reviewed the transcripts and analysis results.

Patient or public involvement

This research was conducted with partial participant involvement. Participants were not

invited to comment on the study design and methods. However, they were emailed their own transcripts and analysis results, and invited to comment on them. Four commented via email or face-to-face, and confirmed that there were no issues in the readability and accuracy of the transcripts and the results obtained from them. This process strengthened the overall credibility of the study.[36]

RESULTS

While exploring what kind of experiences influence *chiikiwaku* students' motivation for practicing CH and the mechanisms of this influence, three mechanisms emerged as the main themes: envisioning and preparing for practicing CH, belonging to a supportive community, and psychological effects. The corresponding experiences, which emerged as sub-themes, brought about the changes and influences described in the presented mechanisms and had both a positive and negative impact on students' motivation toward CH, depending on the level of fulfillment obtained through the experiences and whether students were able to accept them.

1. Envisioning and preparing for practicing CH

Chiikiwaku students envisioned and prepared for their future practice of CH through five

experiences: “empathy for the community,” “grasping the demands for CH,” “understanding the practices of CH,” “finding a role model,” and “diminishing the conflicts between personal life and career.”

1.1 Empathy for the community

Students generated empathy by comparing their own thoughts, living environments, and cultural backgrounds with those of community residents and healthcare professionals through community dialogues and experiences.

> I’ve been to many different areas…When I talk to local people, I can see their lives are not different from those in other areas. I think it’s very important to listen to local people. (Student 5, rural)

This empathy results from the recognition that there is little difference between them. Even if there were some differences, they still felt empathy.

> In certain areas I’ve visited, I heard I couldn’t survive without a car. As my parents don’t have a car, I could never imagine a life in which a car is indispensable. I understood what such a life is like when I went there…It may be simply that different people have different lifestyles. (Student 6, urban)

This empathy created a sense of familiarity and security in the community and reduced psychological barriers to continuing to belong to the community in the future.

1.2 Grasping the demands of CH

Students saw that patients and their families appreciated healthcare professionals and directly experienced the community residents' expectations of the students. These experiences satisfied the needs of being evaluated by others, and evoked the willingness to commit to this demand in their future CH practice.

> Every individual I saw expressed gratitude to the doctor…It was a good experience. I'm not sure if this will be my life's work, but I thought it would be nice to commit to this kind of work for a certain period. (Student 14, urban)
>
> The residents were kind. I was impressed when they said to me, 'Please come back.' This experience made me feel that doctors like us are in demand. (Student 13, rural)

Conversely, community residents' excessive expectations for students led to students' fears that they may not be able to fulfill them. This caused anxiety about future CH practices.

> Of course, I would be glad…if I could actually save people's lives in the

future. That being said, the pressure is too much, I wouldn't be able to do everything perfectly. Therefore… I feel it would be challenging. (Student 7, urban)

1.3 Understanding the practices of CH

Students understood CH practices such as holistic medical care, comprehensive care, home care, preventive care, and a community-oriented approach, then imagined their future practice. This experience enabled students to replace uncertainty about their own future practices with practical knowledge. Furthermore, if students were interested in these practices, the desire to practice these activities was stimulated.

It goes without saying that I want to do this job. These experiences are really helpful in that I can now imagine how I would be working in the future. They were very effective opportunities because I could think about what I need to know. (Student 12, urban)

1.4 Finding a role model

If the students' role models' practices were deemed achievable for students in the future, their desire to emulate the role model was stimulated. This experience contributed to the formation of future self-images engaging in CH.

> The doctor was really…the best... He can be an ideal role model. I'm grateful I had many opportunities to see the doctor thereafter. I listened to many of his stories. (Student 5, rural)

However, this was obstructed if the students thought the role models' abilities were beyond their own capacities. Their anxiety about carrying out unfeasible practices in the future was stimulated.

> I really admire them. I think they're great. On the other hand, I'm not confident I can be like them… There are a lot of genuinely smart doctors and those who are passionate about CH. If I was asked if I have such a strong passion, I don't have that much passion, so I'm worried if I can actually become a doctor like them. (Student 7, urban)

1.5 Diminishing the conflicts between personal life and career

Students felt a potential conflict between their imagined future private lives, including marriage and childcare, and their career ideals (e.g., attaining specialist certifications). Diminishing this conflict secured the autonomy of their future daily lives and career choices.

I felt that life events like marriage and having a child will inevitably weaken motivation. That's why, having listened to Dr. A., I'm glad her talk helped me figure out how I can overcome such challenges. (Student 4, urban)

Specialist physician…I have been worried constantly because I don't know what to do if I became interested in obtaining certification. I mean, I thought I would be far behind if I continued as a *chiikiwaku* physician. However, I've heard *chiikiwaku* physicians have been able to obtain specialist certification…. I appreciate this because I no longer have to be worried. (Student 4, urban)

2. Belonging to a supportive community

Robust construction of students' CH community and harmonization with community residents brought about a sense of belonging to a supportive community for *chiikiwaku* students.

2.1 Robust construction of students' CH community

The sense of belonging to the medical student community interested in CH was increased by constructing a robust community relationship.

Listening to different views and expectations of CH helps increase motivation.

> This is because through such experiences, I can feel first-hand that I am part of a group of people who take CH seriously. (Student 12, urban)

On the other hand, critics of CH can decrease students' motivation. However, if the students' CH community functioned in a robust manner and students recognized their own sense of community belonging, then these conflicts might conversely strengthen their sense of belonging.

> From time to time, I came across a doctor who unshakably believes in specialists. I didn't enjoy listening to such a doctor … I would have a myopic view if I constantly listened to people who keep on saying that community physicians are better. I would rather like to say I have seen that side and I dare to have chosen this side. At that time, I felt uncomfortable. Though, in hindsight, that experience helped me choose the right path. (Student 1, urban)

Furthermore, the community support system made students feel secure. In this regard, students' affinity with the community of medical doctors had an interesting role. For some *chiikiwaku* students, their relationships with the local government's administrative department that has the authority to decide their future working location was perceived as an employee–employer relationship. However, when students realized

there were doctors in the administrative department and that these doctors were involved in supporting their careers, the feeling of an employee–employer relationship was eased, and their feeling of autonomy regarding career choice was secured.

> As the government always tells us where to go, I've been feeling that I'm made to work for them. As I didn't know that certain doctors are working as government officers, I was thinking that those who don't know much about what doctors do are unilaterally deciding what we should do. It was valuable to learn that the government includes those who understand doctors' work and that such people care about our careers and are trying to develop a system in which we can have equal opportunities. (Student 1, urban)

2.2 Harmonization with community residents

As newcomers, students felt anxious about creating relationships with the community residents. However, as students recognized that they were accepted into the community, the sense of belonging to the community of residents was engendered. Furthermore, community residents' dedication to CH and medical education evoked students' desires to contribute to the community.

> As I was very welcomed there, I would like to give back to them by working

hard. …When they said, 'Is there anything to learn from us?' and 'I would be more than happy to help you if it would be beneficial,' I felt that I was given such valuable opportunities to learn. (Student 10, urban)

3. Psychological effects

Psychological effects, namely the affect heuristic and framing effect, stimulated students' motivation to contribute to CH, by improving their conceptual image of CH.

3.1 Affect heuristic

This is a psychological effect in which emotions affect the judgment of things quickly and automatically.[40] CBME elements such as unique experiences in the community, interaction with others, enjoyable and relaxed practice environments, acquisition of fresh knowledge and skills, and finding a role model induced enjoyable, happy, and positive feelings in students. These positive feelings impacted their conceptual image of CH.

For clinical clerkship in university, for example, I have to take training seriously, but the summer program was rather fun, a more harmonious training and hence was quite interesting. (Student 5, rural)

3.2 Framing effect

This is a cognitive bias in which a presentation of something creates a decision-making bias.[41] Showing that CH professionals had an enjoyable work life and lifestyle, and describing how rewarding CH can be to students created a framing effect that CH was worthwhile. This affected students' conceptual image of CH.

> All doctors look happy there. Every time I go there, I'm reminded they all enjoy working there. Every doctor is thriving there. (Student 4, urban)

DISCUSSION

We explored what kind of experiences influence *chiikiwaku* students' motivation for practicing CH and the mechanism of this influence. Three mechanisms (main themes) and corresponding experiences (sub-themes) emerged. The first theme was envisioning and preparing for practicing CH. Its sub-themes were empathy for the community, grasping the demands for CH, understanding the practices of CH, finding a role model, and diminishing the conflicts between personal life and career. The second theme was belonging to a supportive community. Its sub-themes included robust construction of students' CH community and harmonization with community residents. The third theme included psychological effects. Its sub-themes were the affect heuristic and framing effect.

The corresponding experiences brought about the changes and influences on the students described in the presented mechanisms, and motivated them to practice CH.

We used theoretical frameworks[27-30] to interpret the process of how these experiences motivated students. The first mechanism, envisioning and preparing for practicing CH, strengthens the expectation of success and subjective task value[29] through self-images of future CH practice. In addition, each experience that led to envisioning and preparing for practicing CH also included other motivating factors for students. Empathy for the community brings positive emotions such as optimism, calmness, and relaxation from familiarity and security, which influence intrinsic motivation.[30] Furthermore, deeper knowledge of the region can building a self-image of living in the region through reducing psychological barriers, and increase expectation of success[29] in living and practicing CH in the region. With regard to grasping the demands for CH, students can recognize the importance of CH from the gratitude shown to healthcare professionals and the expectations of the students expressed by community residents and patients. This experience makes students recognize the task value[29] of CH. Furthermore, the regulation types proposed by SDT[28] can also be used to interpret these experiences. This is an example of introjected regulation if their practice of CH is praised by others, and identified regulation which refers to the recognition that CH is important. Through these

regulations, students' need for competence can be stimulated. On the other hand, excessive expectations cause negative emotions for students (i.e., anxiety), who fear that they may not have the required abilities or may not meet the expectations of residents and patients, and reduce their expectation of success.[29] With regard to finding a role model, if a student's expectation that they can become like their role model increases, their need for competence is stimulated; by contrast, if the expectation of success decreases, the need for competence is stifled.[28] Additionally, finding a role model evokes a positive emotion arising from the desire to be like the role model: enthusiasm. This positive emotion could bring more internalized regulation,[30] specifically integrated regulation, which integrates the identification of the value of CH and students' self-beliefs, or intrinsic regulation related to students' strong interests.[28] With regard to diminishing the conflicts between personal life and career, knowing how physicians practicing CH deal with these conflicts and improving students' ability to cope can increase the expectation of success.[29] Assurance of students' autonomy in career choice secure their need for autonomy.[28] Moreover, confirmation of autonomy bring about a shift from negative (worry) to positive emotions (calmness).[30]

With reference to the second mechanism, belonging to a supportive community satisfies students' relatedness needs.[28] In addition, regarding the robust construction of

students' CH community, the fact that doctors working in the local government actively support students and reduce the sense of an employee-employer relationship brings positive emotions (calmness)[30] for students, and secures their autonomy needs[28] regarding their career choice. With regard to harmonization with community residents, the active involvement of residents in student education arouses the students' needs for competence,[28] stimulating their desire to contribute to the community. This could also stimulate integrated regulation, which goes beyond simple praise or recognition of importance.[28]

Regarding the third main theme, the affect heuristic and framing effects induce improvements in the students' image of CH. Positive emotions (enthusiasm, cheerfulness, optimism, contentedness, calmness, and relaxation) are greatly involved in this.[40 41] These positive emotions also promote intrinsic regulation, related to students' strong interests.[30]

In previous studies, broad practice scope,[42-45] general practice,[46] specialty,[42 44] clinical skill,[46] role models,[43 44 47 48] work satisfaction,[42 49] lifestyle,[43 44 46 50] exposure to different places,[49] rural rotation,[49] patient interaction,[46] and social network[47] have been listed as factors that increase the medical students' primary care and/or rural healthcare motivations. Our study's findings are consistent with these previous findings. For example, broad practice scope, general practice, specialty, clinical skill and work

satisfaction would be included in understanding the practices of CH. Lifestyle would be included in diminishing the conflicts between personal life and career. Exposure to different places, rural rotation, and patient interaction would be included in empathy for the community, grasping the demands for CH, and harmonization with community residents. Finally, social network would be included in robust construction of students' CH community and harmonization with community residents. However, the novel significance of our study is that it includes detailed descriptions of how these factors (experiences) affected students' motivation and interprets the results through the lenses of multi-faceted motivation theories. In addition, importantly, the influence of psychological effects on students' motivation was suggested.

Lessons for CBME programming

How should our results be used when designing and reconstructing CBME programs so as to effectively foster students' motivation to become involved in CH? We suggest five possible approaches.

First, there should be many opportunities to interact with community residents as well as patients. By interacting with them, students can learn more about the community and the region, understand appreciation for and expectations of healthcare professionals

and students, construct relationships with the community of residents, and have enjoyable experiences that they cannot otherwise gain by working in hospitals.

Second, patients and community residents should be asked to share their appreciation for healthcare professionals and health-related concerns with students. Communicating gratitude and expectations to others is sometimes embarrassing. However, this is important for helping students easily grasp the demands of CH.

Third, healthcare professionals should provide positive messages to students about why they continue their work, how they feel rewarded, what they enjoy in work and life, and how to deal with conflicts between their private lives and careers. These make it easier for students to perceive healthcare professionals as role models, and facilitate the student's vision of their future CH practice. Furthermore, the framing effect improves the student's conceptual image of CH.

Fourth, there should be time for students to interact with each other and have an enjoyable leisure time. This would construct robust student relationships and generate pleasant memories, which would improve the students' conceptual image of CH through affect heuristics.

Fifth, there should be time to become familiar with the community environments and cultures. If these become enjoyable experiences for students, students would become

attached to the community and region, have increased empathy for them, and their conceptual image of CH would again be improved through affect heuristics.

Incorporation of these items into CBME programs may encourage students to maintain and improve their motivation for practicing CH.

Limitations

There were several limitations to our study.

First, this study focused on what kind of experiences influence *chiikiwaku* students' motivation for practicing CH, and the mechanism of this influence, and was not intended to provide reasons to motivate other students to participate in the *chiikiwaku* system or engage in CH. In order to increase the number of physicians engaged in CH, it is necessary to motivate not only *chiikiwaku* students but all other students as well. Further research targeting general students who have no CH obligations are needed.

Second, study participants were limited to *chiikiwaku* students from a single university. There are many variations in the *chiikiwaku* system, including selection methods, scholarship options, and working style after graduation, among others. *Chiikiwaku* doctors who graduate from Kobe University may work at small medical institutions in rural areas, but some *chiikiwaku* doctors who attended other universities

may work after graduation at tertiary care medical institutions in the prefectures where their own universities were located. Thus, it is unclear whether all obligated students will be motivated to participate in CH through similar mechanisms. In this regard, further research targeting *chiikiwaku* students who belong to other universities is also needed.

Third, this study was conducted with students by their teachers. Thus, their hierarchical relationship could be a problem.[34] To address this problem, we made various efforts as described in the Methods, however we cannot completely eliminate the social desirability bias.[35]

CONCLUSIONS

The *chiikiwaku* students developed a motivation to be involved in CH through self-images of their future CH practice and life (i.e., envisioning and preparing for practicing CH); constructing a robust student CH community and harmonizing with community residents (i.e., belonging to a supportive community); and experiences generating positive emotions that improve their conceptual image of CH (psychological effects). Many of these mechanisms are generated by positive interaction with community residents, healthcare professionals, and other students, and in exposure to attractive community

environments and cultures. Thus, these experiences should be incorporated into CBME programs to further encourage students' positive attitudes toward CH.

ACKNOWLEDGEMENTS

The authors wish to thank Editage (www.editage.com) for English language editing.

COMPETING INTERESTS

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

FUNDING

This study was supported by Grants-in-Aid for Scientific Research from the Japan Society for the Promotion of Science (JSPS KAKENHI Grant Number JP16K08870).

ETHICAL APPROVAL

The Institutional Review Board of Kobe University Graduate School of Medicine approved this study on July 17, 2018 (number 180087).

CONTRIBUTORS

YS was chiefly responsible for the study design, acquisition, analysis, and interpretation of the data and drafting of the manuscript. OM contributed to the study design, analysis,

and interpretation of the data, and a critical revision of the manuscript. TT and KT contributed to the study design and the critical revision of the manuscript. All of the authors approved the final version of the manuscript.

DATA AVAILABILITY STATEMENT

The data used and/or analyzed during the current study are available from the corresponding author on reasonable request.

REFERENCES

1. Marengoni A, Angleman S, Melis R, et al. Aging with multimorbidity: a systematic review of the literature. *Ageing Res Rev* 2011;10(4):430-9. doi: 10.1016/j.arr.2011.03.003 [published Online First: 16 March 2011]

2. Tsutsui T. Implementation process and challenges for the community-based integrated care system in Japan. *Int J Integr Care* 2014;14:e002. doi: 10.5334/ijic.988 [published Online First: 31 January 2014]

3. World Health Organization Centre for Health Development (Kobe, Japan). *A glossary of terms for community health care and services for older persons. Kobe, Japan: World Health Organization Centre for Health Development.* 2004. https://apps.who.int/iris/handle/10665/68896 (accessed 3 April 2020).

4. Kainuma M, Kikukawa M, Nagata M, et al. Competencies necessary for becoming a leader in the field of community medicine: a Japanese qualitative interview study. *BMJ Open* 2018;8(4):e020082. doi: 10.1136/bmjopen-2017-020082 [published Online First: 19 April 2018]

5. World Health Organization. (ed.) *Increasing Access to Health Workers in Remote and Rural Areas Through Improved Retention: Global Policy Recommendations.* Geneva, Switzerland: WHO Press, 2010.

6. Matsumoto M, Inoue K, Takeuchi K. Quality of care in Japan: an additional strategy. *Lancet* 2011;378(9807):e17. doi: 10.1016/S0140-6736(11)61841-2 [published Online First: 6 December 2011]

7. Kataoka Y, Takayashiki A, Sato M, et al. Japanese regional-quota medical students in their final year are less motivated to work in medically underserved areas than they were in their first year: a prospective observational study. *Rural Remote Health* 2018;18(4):4840. doi: 10.22605/RRH4840 [published Online First: 27 October 2018]

8. Matsumoto M, Takeuchi K, Owaki T, et al. Results of physician licence examination and scholarship contract compliance by the graduates of regional quotas in Japanese medical schools: a nationwide cross-sectional survey. *BMJ Open*

2017;7(12):e019418. doi: 10.1136/bmjopen-2017-019418 [published Online First: 25 December 2017]

9. Hearst N, Shore WB, Hudes ES, et al. Family practice bashing as perceived by students at a university medical center. *Fam Med* 1995;27(6):366-70. [published Online First: 1 June 1995]

10. Bowman MA, Haynes RA, Rivo ML, et al. Characteristics of medical students by level of interest in family practice. *Fam Med* 1996;28(10):713-9. [published Online First: 1 November 1996]

11. Barrett FA, Lipsky MS, Lutfiyya MN. The impact of rural training experiences on medical students: a critical review. *Acad Med* 2011;86(2):259-63. doi: 10.1097/ACM.0b013e3182046387 [published Online First: 21 December 2010]

12. Kelly L. (ed.) *Community-based medical education: a teacher's handbook.* Radcliffe Publishing: London, England, 2012.

13. Crampton PES, McLachlan JC, Illing JC. A systematic literature review of undergraduate clinical placements in underserved areas. *Med Educ* 2013;47(10):969-78. doi: 10.1111/medu.12215 [published Online First: 11 September 2013]

14. Lee SW, Clement N, Tang N, et al. The current provision of community-based

teaching in UK medical schools: an online survey and systematic review. *BMJ Open* 2014;4(12):e005696. doi: 10.1136/bmjopen-2014-005696 [published Online First: 3 December 2014]

15. Laven G, Wilkinson D. Rural doctors and rural backgrounds: how strong is the evidence? A systematic review. *Aust J Rural Health* 2003;11(6):277-84. doi: 10.1111/j.1440-1584.2003.00534.x [published Online First: 18 December 2003]
16. Okayama M, Kajii E. Does community-based education increase students' motivation to practice community health care?--a cross sectional study. *BMC Med Educ* 2011;11:19. doi: 10.1186/1472-6920-11-19
17. Viscomi M, Larkins S, Gupta TS. Recruitment and retention of general practitioners in rural Canada and Australia: a review of the literature. *Can J Rural Med* 2013;18(1):13-23. [published Online First: 25 December 2012]
18. Pfarrwaller E, Sommer J, Chung C, et al. Impact of Interventions to Increase the Proportion of Medical Students Choosing a Primary Care Career: A Systematic Review. *J Gen Intern Med* 2015;30(9):1349-58. doi: 10.1007/s11606-015-3372-9 [published Online First: 16 July 2015]
19. Strasser R, Worley P, Cristobal F, et al. Putting communities in the driver's seat: the realities of community-engaged medical education. *Acad Med* 2015;90(11):1466-

70. doi: 10.1097/acm.0000000000000765 [published Online First: 29 May 2015]

20. Budhathoki SS, Zwanikken PA, Pokharel PK, et al. Factors influencing medical students' motivation to practise in rural areas in low-income and middle-income countries: a systematic review. *BMJ Open* 2017;7(2):e013501. doi: 10.1136/bmjopen-2016-013501 [published Online First: 25 February 2017]

21. Johnson GE, Wright FC, Foster K. The impact of rural outreach programs on medical students' future rural intentions and working locations: a systematic review. *BMC Med Educ* 2018;18(1):196. doi: 10.1186/s12909-018-1287-y [published Online First: 16 August 2018]

22. Crampton PES. *Medical student learning during longitudinal clinical placements in under-served, deprived, community areas: A qualitative study*. Doctoral theses. Durham University; 2015.

23. Dube TV, Schinke RJ, Strasser R, et al. Transition processes through a longitudinal integrated clerkship: a qualitative study of medical students' experiences. *Med Educ* 2015;49(10):1028-37. doi: 10.1111/medu.12797 [published Online First: 19 September 2015]

24. O'Brien BC, Harris IB, Beckman TJ, et al. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* 2014;89(9):1245-51. doi:

10.1097/acm.0000000000000388 [published Online First: 1 July 2014]

25. Denzin NK, Lincoln YS. *The SAGE Handbook of Qualitative Research.* 5th ed. Thousand Oaks, CA: SAGE Publications; 2017.

26. Cook DA, Artino AR, Jr. Motivation to learn: an overview of contemporary theories. *Med Educ* 2016;50(10):997-1014. doi: 10.1111/medu.13074

27. Reeve J. *Understanding Motivation and Emotion*. 7th ed. Hoboken, NJ: John Wiley & Sons; 2018.

28. Deci EL, Ryan RM. The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychol Inq* 2000;11(4):227-68. doi: 10.1207/S15327965PLI1104_01

29. Wigfield A, Eccles JS. Expectancy-Value Theory of Achievement Motivation. *Contemp Educ Psychol* 2000;25(1):68-81. doi: 10.1006/ceps.1999.1015 [published Online First: 6 January 2000]

30. Vandercammen L, Hofmans J, Theuns P. Relating specific emotions to intrinsic motivation: on the moderating role of positive and negative emotion differentiation. *PloS One* 2014;9(12):e115396-e96. doi: 10.1371/journal.pone.0115396

31. Ten Cate TJ, Kusurkar RA, Williams GC. How self-determination theory can assist

our understanding of the teaching and learning processes in medical education. AMEE guide No. 59. *Med Teach* 2011;33(12):961-73. doi: 10.3109/0142159x.2011.595435 [published Online First: 10 January 2012]

32. Kusurkar RA, Croiset G, Mann KV, et al. Have motivation theories guided the development and reform of medical education curricula? A review of the literature. *Acad Med* 2012;87(6):735-43. doi: 10.1097/ACM.0b013e318253cc0e [published Online First: 27 April 2012]

33. Orsini C, Binnie VI, Wilson SL. Determinants and outcomes of motivation in health professions education: a systematic review based on self-determination theory. *J Educ Eval Health Prof* 2016;13:19-19. doi: 10.3352/jeehp.2016.13.19

34. Boet S, Sharma S, Goldman J, et al. Review article: medical education research: an overview of methods. *Can J Anaesth* 2012;59(2):159-70. doi: 10.1007/s12630-011-9635-y [published Online First: 5 January 2012]

35. Nederhof AJ. Methods of coping with social desirability bias: A review. *Eur J Soc Psychol* 1985;15(3):263-80. doi: 10.1002/ejsp.2420150303

36. Polit DF, Beck CT. *Nursing Research: Principles and Methods.* 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2004.

37. Saunders B, Sim J, Kingstone T, et al. Saturation in qualitative research: exploring its

conceptualization and operationalization. *Qual Quant* 2018;52(4):1893-907. doi: 10.1007/s11135-017-0574-8 [published Online First: 14 September 2017]

38. Otani T. "SCAT" A qualitative data analysis method by four-step coding: Easy startable and small scale data-applicable process of theorization. *Bulletin of the Graduate School of Education and Human Development (Educational Sciences), Nagoya University* 2007;54:27-44 (in Japanese with English abstract).

39. Otani T. Qualitative research series SCAT: Steps for Coding and Theorization--A qualitative data analysis methodology with explicit procedures that is easy to start and applicable to smaller data. *Kansei Kougaku* 2011;10(3):155-60 (in Japanese).

40. Finucane ML, Alhakami A, Slovic P, et al. The affect heuristic in judgments of risks and benefits. *J Behav Decis Mak* 2000;13(1):1-17. doi: 10.1002/(sici)1099-0771(200001/03)13:1<1::Aid-bdm333>3.0.Co;2-s

41. Tversky A, Kahneman D. The framing of decisions and the psychology of choice. *Science* 1981;211(4481):453-58. doi: 10.1126/science.7455683

42. Dixon AS, Lam CL, Lam TP. Does a brief clerkship change Hong Kong medical students' ideas about general practice? *Med Educ* 2000;34(5):339-47. [published Online First: 12 April 2000]

43. Jordan J, Brown JB, Russell G. Choosing family medicine. What influences medical

students? *Can Fam Physician* 2003;49:1131-7. [published Online First: 7 October 2003]

44. Scott I, Wright B, Brenneis F, et al. Why would I choose a career in family medicine?: Reflections of medical students at 3 universities. *Can Fam Physician* 2007;53(11):1956-7. [published Online First: 15 November 2007]

45. Ohta R, Ryu Y, Katsube T, et al. Students' perceptions of general medicine following community-based medical education in rural Japan. *J Gen Fam Med* 2019;20(6):236-43. doi: 10.1002/jgf2.274

46. Stagg P, Greenhill J, Worley PS. A new model to understand the career choice and practice location decisions of medical graduates. *Rural Remote Health* 2009;9(4):1245. [published Online First: 1 December 2009]

47. Roberts C, Daly M, Kumar K, et al. A longitudinal integrated placement and medical students' intentions to practise rurally. *Med Educ* 2012;46(2):179-91. doi: 10.1111/j.1365-2923.2011.04102.x [published Online First: 14 January 2012]

48. Kawamoto R, Uemoto A, Ninomiya D, et al. Characteristics of Japanese medical students associated with their intention for rural practice. *Rural Remote Health* 2015;15(2):3112. [published Online First: 13 June 2015]

49. Codsi MP, Rodrigue R, Authier M, et al. Family medicine rotations and medical

students' intention to pursue family medicine: Descriptive study. *Can Fam Physician* 2019;65(7):e316-e20. [published Online First: 14 July 2019]51. Birden HH, Wilson I. Rural placements are effective for teaching medicine in Australia: evaluation of a cohort of students studying in rural placements. *Rural Remote Health* 2012;12:2167. [published Online First: 2012/11/20]

50. Birden HH, Wilson I. Rural placements are effective for teaching medicine in Australia: evaluation of a cohort of students studying in rural placements. *Rural Remote Health* 2012;12:2167. [published Online First: 20 November 2012]

Supplemental appendix. Interview guide used in the study.

1. What do you think about community healthcare (CH)?
2. Why do you think so?
3. What were the events that affected your perception about CH?
4. How did the events affect your perception about CH?
5. How does the experience of home care affect your perception about CH?
6. How does the experience of day care/service affect your perception about CH?
7. How does the experience of health education for local residents affect your perception about CH?
8. How does the experience in the rural area affect your perception about CH?

Reporting checklist for qualitative study.

Based on the SRQR guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SRQRreporting guidelines, and cite them as:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014;89(9):1245-1251.

	Reporting Item	Page Number
Title		
#1	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	1

Abstract			
	#2	Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2-3
Introduction			
Problem formulation	#3	Description and signifcance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	4-6
Purpose or research question	#4	Purpose of the study and specific objectives or questions	6
Methods			
Qualitative approach and research paradigm	#5	Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenolgy, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability.	6-9

		As appropriate the rationale for several items might be discussed together.	
Researcher characteristics and reflexivity	#6	Researchers' characteristics that may influence the research, including personal attributes, qualifications / experience, relationship with participants, assumptions and / or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and / or transferability	9-10
Context	#7	Setting / site and salient contextual factors; rationale	10-11
Sampling strategy	#8	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g. sampling saturation); rationale	11
Ethical issues pertaining to human subjects	#9	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	11, 32
Data collection methods	#10	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources / methods, and modification of procedures in response to evolving study findings; rationale	12

Data collection instruments and technologies	#11	Description of instruments (e.g. interview guides, questionnaires) and devices (e.g. audio recorders) used for data collection; if / how the instruments(s) changed over the course of the study	12
Units of study	#12	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	12
Data processing	#13	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymisation / deidentification of excerpts	12
Data analysis	#14	Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	13-14
Techniques to enhance trustworthiness	#15	Techniques to enhance trustworthiness and credibility of data analysis (e.g. member checking, audit trail, triangulation); rationale	14-15
Results/findings			
Syntheses and interpretation	#16	Main findings (e.g. interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	15

Links to empirical data	#17	Evidence (e.g. quotes, field notes, text excerpts, photographs) to substantiate analytic findings	15-24
Discussion			
Intergration with prior work, implications, transferability and contribution(s) to the field	#18	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application / generalizability; identification of unique contributions(s) to scholarship in a discipline or field	24-30
Limitations	#19	Trustworthiness and limitations of findings	30-31
Other			
Conflicts of interest	#20	Potential sources of influence of perceived influence on study conduct and conclusions; how these were managed	32
Funding	#21	Sources of funding and other support; role of funders in data collection, interpretation and reporting	32