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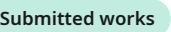
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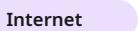
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Assessing the undergraduate medical students' acceptance and barriers of community-based education in population and Puskesmas levels: A preliminary study

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Abstract

Purpose: This study aims to identify aspects of acceptance and barriers to implementing community-based education (CBE) at the population and Puskesmas levels. **Methods:** A preliminary study was conducted in the Faculty of Medicine, Soegijapranata Catholic University, Semarang, in April 2024. Data were collected using a Likert-scale questionnaire, which surveyed 95 medical students participating in the CBE program at both the population and Puskesmas settings. Data analysis was carried out descriptively. **Results:** The distribution of respondents' experiential learning perceptions from the category "good" was a majority in the cycle of concrete experience aspect (100% at the population level and 89,58% at the Puskesmas level) and reflective observation (100% at the population level and 87,5% at the Puskesmas level). However, the percentage of 'disagree' and 'strongly disagree' ratings was found to be more frequent in Puskesmas when it came to accepting CBE benefits for students. **Conclusion:** Students benefit from the overall implementation of CBE at the population and Puskesmas levels. Further action research is needed to accommodate student learning styles in community-based education programs.

Keywords: community-based education; experiential learning; population level; public health center

INTRODUCTION

Health professional education institutions have widely adopted community-based education (CBE). The CBE program includes activities where students learn professional competencies in a community setting [1]. Students gain professional skills in project management, communication, self-reflection, empathy, and knowledge related to social inequalities in health, health determinants, and health literacy [2,3].

One of the theories that underlies learning from actual experiences in the community is Kolb's experiential learning theory. Kolb's experiential learning cycle consists of four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Concrete experience refers to students gaining experience in the field, while reflective observation refers to students reviewing or reflecting on the experience gained from a different perspective. Students can create concepts in abstract conceptualization by integrating observations into their prior knowledge. Then, in active experimentation, students can use what they have learned to make

decisions and solve problems in response to future experiences [4,5]. The continuous experiential learning cycle leads to the development of student competence in medical education in the following years.

Implementing early CBE programs from the first year will help students better understand public health problems [6]. Several studies implemented gradual CBE activities starting from the early undergraduate years. One study featured a longitudinal community-based interprofessional education (IPE) program from the first to the fourth year of undergraduate education [7]. Another study in Switzerland conducted a 6-year longitudinal and multidisciplinary Community Health Program [8]. Topics from the undergraduate CBE curriculum can be designed in stages each year, with the principles of health care, starting from the first year, focusing on individuals, the second year focusing on families, and the third year focusing on special age groups [9]. However, there has yet to be an agreement on how CBE activities occur when students are off campus. Some institutions only apply CBE programs for particular years, even with different durations, even though they are carried out yearly [1].

In health care, the community refers to all healthcare facilities with potential teaching sites or only includes community components in non-hospital settings [10]. Therefore, various variations of community learning can be carried out in healthcare facilities, rural communities, and special populations as a place for CBE activities [9,11]. There have been studies that have compiled learning objectives for CBE programs, but they have been described in general terms [12]. CBE emphasizes contextual learning, which refers to the physical and social situation or context in which people are [11]. Therefore, it is necessary to adapt learning outcomes for each CBE setting. In the primary care setting, it can refer to medical content (prevention across the natural history of disease) and primary care medicine principles (person-centered care, continuity of care, holistic care, and comprehensive care); meanwhile, the community population depends on the target setting [9].

Some studies focus only on rural communities implementing CBE [6,13,14], while others focus on rural primary healthcare centers [4,8]. Few studies have compared CBE settings in terms of students' learning outcomes. Although the population and Public Health Centers (Puskesmas) are both carried out in community settings, populations are dynamic, while Puskesmas are basic health service units. In addition, student perceptions and acceptance of CBE can be the same or different between the population and Puskesmas

levels. However, CBE activities are gradually carried out in specific learning environments, and medical schools must conduct more in-depth exploration of the differences in experiential learning results across different settings in the same study. Therefore, based on the experiential learning cycle, preliminary research is needed to identify the acceptance and implementation barriers to CBE among students in the population and at the Puskesmas level.

METHODS

This study uses a preliminary design conducted at the Faculty of Medicine, Soegijapranata Catholic University, in April 2024. The CBE program, known as the Soegijapranata Community Project (SCP), is carried out every semester from the first to the third year. Second-year students focus on learning in community populations at the Neighbourhood/ Community Association (Rukun Tetangga/Rukun Warga) level. In contrast, third-year students focus on learning at public health centers (Puskesmas).

The population of this study was second and third-year medical students who enrolled in the CBE program at the Faculty of Medicine, Soegijapranata Catholic University, with the inclusion criteria being medical students who had enrolled in the CBE program one semester before at the population and Puskesmas levels, regularly visited the CBE setting according to the semester year, and had already working on a written reflection after taking the CBE every semester.

Data was collected by distributing questionnaires to measure student perceptions about community-based learning in the population and Puskesmas. This questionnaire has 23 question items, consisting of four stages of Kolb's experiential learning cycle: concrete experience (7 items), reflection on observation (5 items), abstract conceptualization (6 items), and active experimentation (5 items) [5], adapted from Claramita and Carlisle's research [9,15]. This questionnaire uses a 4-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, or 4 = strongly agree) to assess student perceptions of experiences gained from the community. Respondents' answers to each CBE setting were categorized on a scale of good (if the answer percentage score was >75%) and less (if the answer percentage score was <75%).

The data analysis used univariate analysis to describe student perceptions of learning in a CBE setting, referring to the population and Puskesmas levels. The study applied quantitative data analysis and presented the results descriptively through tables.

RESULTS

This study recruited 95 respondents: 48 students from the 2021 batch and 47 students from the 2022 batch. Most respondents were women, at 66.32%, compared to men at 33.68%.

The student perception questionnaire towards community-based education is divided into four stages based on the experiential learning cycle. Table 1 shows that the population and Puskesmas levels have the highest percentage of respondents in the good perception category regarding concrete experience and reflective observation. However, the percentage for reflective observation, abstract conceptualization, and active experimentation obtained almost the same results in students' acceptance of the benefits of CBE, both at the population and Puskesmas levels.

Table 2 shows the distribution of respondents' answers for each questionnaire item based on population and Puskemas level. The range of student assessments regarding the benefits of CBE is mainly spread across ratings of 3 (agree) and 4 (strongly agree). This indicates that students generally agree that CBE provides learning benefits based on four-stage experiential learning cycles at the population and Puskesmas levels. However, ratings 2 (disagree) and 1 (strongly disagree) are still expressed more often by students at the Puskesmas level than by the population level. Specifically, six students disagree or strongly disagree that CBE facilitates reflection on how students perform in group or teamwork settings and that CBE helps identify future learning needs.

Table 1. Distribution of students' experiential learning perceptions based on CBE setting type

| | Experiential learning cycle (n,%) | | | |
	Concrete experience	Reflective observation	Abstract conceptualization	Active experimentation
Population-level				
Good	47 (100)	47 (100)	45 (95.74)	45 (95.74)
Less	0 (0)	0 (0)	2 (4.26)	2 (4.26)
Puskesmas / public health center level				
Good	43 (89.58)	42 (87.5)	42 (87.5)	42 (87.5)
Less	5 (10.42)	6 (12.5)	6 (12.5)	6 (12.5)

Table 2. Student's response to the experiential learning cycle questionnaire items (n=95)

No	Questionnaire items	Population-level (%)				Puskesmas /Public health center level (%)			
		Strongly agree	Agree	Disagree	Strongly disagree	Strongly agree	Agree	Disagree	Strongly disagree
Concrete experience									
1	Understanding the leadership skill	21 (44.68)	26 (55.32)	0 (0.00)	0 (0.00)	21 (43.75)	26 (54.17)	1 (2.08)	0 (0.00)
2	Developing good teamwork skills	16 (34.04)	28 (59.57)	3 (6.38)	0 (0.00)	21 (43.75)	24 (50.00)	3 (6.25)	0 (0.00)
3	Had adequate communication with the community	30 (63.83)	17 (36.17)	0 (0.00)	0 (0.00)	22 (45.83)	24 (50.00)	2 (4.17)	0 (0.00)
4	Identifying health problems in the community	21 (44.68)	26 (55.32)	0 (0.00)	0 (0.00)	19 (39.58)	26 (54.17)	3 (6.25)	0 (0.00)
5	Better approach to problem-solving	18 (38.30)	28 (59.57)	1 (2.13)	0 (0.00)	21 (43.75)	24 (50.00)	3 (6.25)	0 (0.00)
6	More likely to be responsible in group/teamwork	18 (38.30)	28 (59.57)	1 (2.13)	0 (0.00)	20 (41.67)	25 (52.08)	2 (4.17)	1 (2.08)
7	More likely to be empathetic with the community	25 (53.19)	22 (46.81)	0 (0.00)	0 (0.00)	19 (39.58)	28 (58.33)	1 (2.08)	0 (0.00)
Reflective observation									
8	Facilitating reflection on the experiences in the community	23 (48.94)	24 (51.06)	0 (0.00)	0 (0.00)	19 (39.58)	25 (52.08)	3 (6.25)	1 (2.08)
9	Facilitating reflection on how I do my job in group/teamwork	21 (44.68)	25 (53.19)	0 (0.00)	1 (2.13)	16 (33.33)	26 (54.17)	6 (12.50)	0 (0.00)
10	Facilitating reflection on what is the good thing that has been done	21 (44.68)	25 (53.19)	1 (2.13)	0 (0.00)	20 (41.67)	27 (56.25)	1 (2.08)	0 (0.00)
11	Facilitating reflection regarding things that need to be improved	26 (55.32)	21 (44.68)	0 (0.00)	0 (0.00)	19 (39.58)	28 (58.33)	1 (2.08)	0 (0.00)
12	Facilitating reflection to enhance soft skills	25 (53.19)	22 (46.81)	0 (0.00)	0 (0.00)	18 (37.50)	30 (62.50)	0 (0.00)	0 (0.00)

No	Questionnaire items	Population-level (%)				Puskesmas /Public health center level (%)			
		Strongly agree	Agree	Disagree	Strongly disagree	Strongly agree	Agree	Disagree	Strongly disagree
Abstract conceptualization									
13	More likely to learn about medical knowledge, natural history of diseases, epidemiology, and preventive medicine	17 (36.17)	27 (57.45)	3 (6.38)	0 (0.00)	20 (41.67)	25 (52.08)	3 (6.25)	0 (0.00)
14	Understanding the relationship between theory and the experiences in the community	20 (42.55)	26 (55.32)	1 (2.13)	0 (0.00)	18 (37.50)	27 (56.25)	3 (6.25)	0 (0.00)
15	Analyzing social issues	21 (44.68)	25 (53.19)	1 (2.13)	0 (0.00)	18 (37.50)	29 (60.42)	1 (2.08)	0 (0.00)
16	Understanding of limited resources and challenges in society related to health problems	22 (46.81)	25 (53.19)	0 (0.00)	0 (0.00)	21 (43.75)	25 (52.08)	2 (4.17)	0 (0.00)
17	Encouraging to find the latest scientific evidence-based learning resources	19 (40.43)	25 (53.19)	3 (6.38)	0 (0.00)	19 (39.58)	26 (54.17)	2 (4.17)	1 (2.08)
18	Developing data collection instruments with scientific writing rules	21 (44.68)	25 (53.19)	1 (2.13)	0 (0.00)	18 (37.50)	26 (54.17)	2 (4.17)	2 (4.17)
Active experimentation									
19	Understanding what to accomplish when faced with a similar case	24 (51.06)	23 (48.94)	0 (0.00)	0 (0.00)	19 (39.58)	28 (58.33)	0 (0.00)	1 (2.08)
20	Identifying future learning needs	18 (38.30)	26 (55.32)	3 (6.38)	0 (0.00)	18 (37.50)	24 (50.00)	5 (10.42)	1 (2.08)
21	More likely to help direct on improving soft skills (e.g., communication, leadership, teamwork, problem-solving, respect for cultural differences)	25 (53.19)	22 (46.81)	0 (0.00)	0 (0.00)	17 (35.42)	28 (58.33)	2 (4.17)	1 (2.08)
22	Facilitating reflection on what to do after being a doctor	22 (46.81)	25 (53.19)	0 (0.00)	0 (0.00)	16 (33.33)	30 (62.50)	2 (4.17)	0 (0.00)
23	Participating in improving public health services in the future	24 (51.06)	23 (48.94)	0 (0.00)	0 (0.00)	15 (31.25)	30 (62.50)	2 (4.17)	1 (2.08)

DISCUSSION

This research was conducted to identify aspects of acceptance and barriers to implementing CBE in population and Puskesmas levels settings from students' perspectives. Students are exposed to learning in the population and Puskesmas settings to see the experience gained based on the experiential learning cycle. Overall, the results of this study show that the majority of students receive benefits from the implementation of CBE at both population settings and Puskesmas levels. Student acceptance of the CBE program dominates in the concrete experience and reflective observation cycles.

Students can observe and learn by doing various tasks in the community or healthcare facilities through concrete experience. This environment makes students understand the importance of health promotion and various social aspects of health [4]. They also develop soft skills in leadership, communication, teamwork, and identifying multiple societal problems, using a holistic approach that is necessary for their future professional careers [16]. Soft skills involve personal, interpersonal, and intrapersonal abilities that are harder to measure and quantify. They are developed through social experiences, dedication, self-reflection, and self-improvement [17]. Experimental learning is conceptualized as students collaborating physically in a contextually rich learning environment. When students are placed in a community, sensory-motor information (sensing and feeling, or acting) becomes embodied in memory traces, allowing their cognition to develop to the highest level [18,19].

Students can learn to reflect on personal experiences gained in the community regarding what is good and what needs improvement. CBE provides opportunities for students to reflect, build self-awareness, and encourage long-term learning [20]. At the initiation and evaluation stage, students are responsible for writing a reflection every semester from the CBE program and obtaining written feedback on the reflections they complete. Therefore, this personal written reflection helps students learn and practice self-reflection on their community experiences. Personal reflection can increase self-awareness and self-advancement and facilitate understanding of individual strengths, weaknesses,

learning needs, self-monitoring, and self-improvement among undergraduate medical students [21].

Our results indicated that a few students need help accepting abstract conceptualization and active experimentation, especially at the Puskesmas level. The learning content of public health and community medicine during the pre-clinical phase is still at the level of identifying the primary health context. However, it must directly interact with patients and the health care system. Apart from that, developing abstract conceptualization from a reflective process into new concepts or knowledge requires the assistance of a supervisor. Teachers can help students find evidence-based resources for community-based learning topics [9,22]. However, in practice, some supervisors only prioritize the outcomes of these CBE activities. It is also essential to hone students' knowledge and skills to construct the new knowledge they have acquired to achieve learning outcomes. In active experimentation, students should apply what they have learned in response to new experiences [5]. However, there is little opportunity to experiment with the exact case actively. Therefore, students usually make action plans in this stage, which may not have been discussed much during the mentoring process.

In addition, based on Kolb's learning styles, which are categorized as divergent, convergent, assimilation, and accommodation, students in the CBE program tend to fall into the divergent category. Divergent thinking is more prominent in concrete experiences and reflective observation because it emphasizes observations that view concrete situations from multiple perspectives and organize many relationships to make them more meaningful [5]. Suppose it relates to the form of CBE activities in the pre-clinical phase. This divergent learning style is dominant because students still focus on observing and getting to know the community and healthcare facilities.

However, students are expected to continue applying all the principles of the experiential learning cycle. If students are not accustomed to enhancing their abstract conceptualization domain by learning basic information from public health content and analyzing community problems, and are not used to developing the active experimentation domain in terms of improving and planning their learning, they will struggle to follow the entire CBE process. Abstract conceptualization helps improve their adaptation skills and understand the reality of limited resources and the challenges that society faces. In contrast, active experimentation helps them internalize their experiences and reflect on what they want to do when they become doctors [4]. Therefore, it will be more difficult for students to create learning strategies and overcome obstacles in community learning if they do not understand the essentials of the experiential learning cycle.

When students are involved in CBE from the start, they must prepare the students to be agents of social change. Students need to fully understand the essence of primary health care from the beginning of medical education [9]. Community-based education helps grow student awareness and provides a better understanding of the social determinants of health, including social factors such as norms, culture, behavior, income, expenditure, and hygiene practices in communities that indirectly affect people's health [13]. Community-based education also enriches educational materials for doctors serving in underserved, border, and outer island areas of Indonesia, because they must understand the service system under limited conditions [23].

This study has limitations, including its focus on only two batches of medical students. In addition, the data collection technique only uses surveys, so researchers cannot explore the reasons behind each respondent's answer. This research only used a small sample size. It was limited to the CBE program at the Faculty of Medicine, Soegijapranata Catholic University, so the research results cannot be generalized to other medical faculties. However, this research combines two CBE settings at the population and Puskesmas levels; thus, it is more precise to see the dominant learning model without ignoring the background of the CBE settings. Therefore, our research can be applied to other medical faculties, especially those developing CBE programs, to provide variations in community settings during undergraduate studies. This CBE system can also be implemented in institutions that have few health study programs and still need to implement interprofessional education. The results of this study provide information to strengthen the model of teacher guidance for students based on the experiential learning model. Moreover, this research is the initial data used to map faculty and supervisor development regarding supportive supervision.

CONCLUSION

Students benefit from implementing community-based education at the population and Puskesmas levels, which are dominated by concrete experiences and reflective observation, but could be more optimal by also accepting abstract conceptualization and an active experimentation cycle. Therefore, action research is needed to strengthen each experiential learning cycle through evaluation, updating methods, and learning outcomes.

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