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Systematic Review

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Understanding the Goals of Service Learning and Community-Based Medical Education: A Systematic Review

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ABSTRACT

Service learning (SL) and community-based medical education (CBME) are increasingly integrated into undergraduate medical training to prepare students for socially accountable practice. While many programs report benefits for students and communities, the specific goals emphasized across contexts remain inconsistently defined. **Objectives:** To provide a comprehensive understanding of how SL and CBME contribute not only to student learning but also to community engagement and institutional development. **Methods:** Following the PRISMA 2020 guidelines, PubMed, Scopus, and the Cochrane Library were searched for English-language studies published between 2019 and 2024. Eligible studies included those involving undergraduate medical students participating in SL or CBME interventions. Data on study design, participants, interventions, and reported outcomes were extracted. Quality appraisal was conducted using the CASP, MMAT, and JBI tools. A thematic synthesis approach was used to categorize findings into educational, community, and institutional domains. **Results:** Sixteen studies were included, spanning Africa, Asia, North America, and the Middle East. Most studies reported educational outcomes such as improved clinical competence, empathy, reflective capacity, and professional identity formation. Community-level goals included increased access to care, health promotion, and stronger partnerships. Institutional goals, such as enhancing curricular relevance and social accountability, were less frequently documented. Few studies evaluated long-term sustainability or objectively measured community outcomes. **Conclusions:** SL and CBME consistently promote student growth while fostering community engagement. However, systematic evaluation of institutional impact and program sustainability remains limited. Future research should adopt longitudinal, multi-institutional approaches to capture durable outcomes and guide curricular reforms aligned with social accountability.

INTRODUCTION

Medical education worldwide is shifting from hospital-centered models toward approaches that emphasize population health and social accountability. Traditional training has been criticized for insufficiently preparing students to address inequities, thereby prompting the adoption of community-based strategies [1]. Globally, evidence shows that service learning (SL) and community-based medical education (CBME) help medical students integrate academic learning with real-world service. In Australia, embedding community engagement early in curricula fosters reflective skills and strengthens readiness for underserved care [2]. In Japan, longitudinal SL electives promoted advocacy and sustained empathy among undergraduates [3]. Similarly, a Japanese study of

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rural placements demonstrates growth in student accountability and community orientation [4]. The COVID-19 pandemic further accelerated innovation in SL and CBME. A U.S. study found that pandemic-modified SL projects preserved student leadership development and professional growth despite restrictions [5]. Comparable findings were noted in India, where virtual CBME activities-maintained student community connections [6]. Local contexts also highlight the need for reform. In Pakistan, short-term community placements improved students' patient interaction skills but lacked long-term follow-up [7]. In Nepal, CBME has been linked with a greater interest in rural service, though challenges in sustainability remain [8, 9]. Across Africa, structured engagement in Uganda and Kenya fostered teamwork and social accountability but highlighted the need for institutional support [10, 11]. Despite these advances, critical gaps persist. Most published work focuses primarily on student perspectives, while systematic evaluation of institutional change and long-term community outcomes remains limited. Therefore, this systematic review was conducted to address these gaps by synthesizing existing evidence and clarifying the explicit goals of SL and CBME within undergraduate medical curricula. This review synthesizes evidence from 2019–2024 to clarify the explicit goals of SL and CBME programs for undergraduate medical students, categorizing them into educational, community, and institutional domains. Establishing evidence base is essential to inform future curriculum design, promote sustainability, and strengthen the social accountability of medical education programs globally. The review aims to provide a comprehensive understanding of how SL and CBME contribute not only to student learning but also to community engagement and institutional development.

METHODS

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines. The primary aim was to explore and synthesize the reported goals of service learning (SL) and community-based medical education (CBME) within undergraduate medical curricula. A comprehensive search was conducted in three electronic databases: PubMed, Scopus, and the Cochrane Library. The search covered studies published between 2019 and 2024, ensuring inclusion of the most recent and relevant evidence. Search terms included both Medical Subject Headings (MeSH) and free-text keywords such as "service learning," "community-based medical education," "undergraduate medical students," "professional identity formation," "empathy," "social accountability," and "community engagement." Boolean operators (AND, OR) were applied to refine the results. Searches were limited to English-language studies, and the reference lists of included articles were screened to identify additional eligible papers. Studies were included if they focused on undergraduate medical students in preclinical or clinical years, reported on interventions involving SL or CBME (e.g., placements, medical camps, project-based courses, or student-run clinics), and described educational, community, or institutional outcomes as primary or secondary objectives. Studies were excluded if they were systematic reviews, meta-analyses, case reports, editorials, or conference abstracts, or if they focused solely on postgraduate trainees, faculty, or non-medical disciplines. Non-English publications and animal studies were also excluded. All identified records were imported into EndNote for reference management. Duplicates were removed before screening. Titles and abstracts were independently reviewed by two authors against the inclusion criteria. Full-text articles of potentially relevant studies were retrieved, and disagreements during selection were resolved through discussion until consensus was reached. Data extraction was performed using a structured proforma to maintain consistency. Extracted data included author, year of publication, country or region, study design, sample size, participants, intervention type, duration, and reported goals or outcomes. The methodological quality of the included studies was assessed using established critical appraisal tools. The Critical Appraisal Skills Program (CASP) checklist was applied to qualitative studies, the Mixed Methods Appraisal Tool (MMAT) to mixed-methods research, and the Joanna Briggs Institute (JBI) checklists to quantitative and cross-sectional designs. Each study was graded as high, moderate, or low quality based on clarity of aims, methodological rigor, appropriateness of analysis, and reporting standards. Given the heterogeneity in study designs and outcomes, a thematic synthesis approach was adopted. Findings were categorized into three overarching domains: educational goals for students, community goals, and institutional goals. Within these domains, subthemes were identified and supported with representative studies. A Venn diagram illustrates the overlaps between domains, highlighting shared outcomes such as professional identity formation, community engagement, and sustainability used consistently throughout to denote both community-level continuity and the long-term impact of educational programs. The database search covered PubMed, Scopus, and Cochrane Library for studies published between January 2017 and August 2025. After removal of duplicates and screening for eligibility, a total of 16 studies met the inclusion criteria and were included in the final synthesis (Figure 1).

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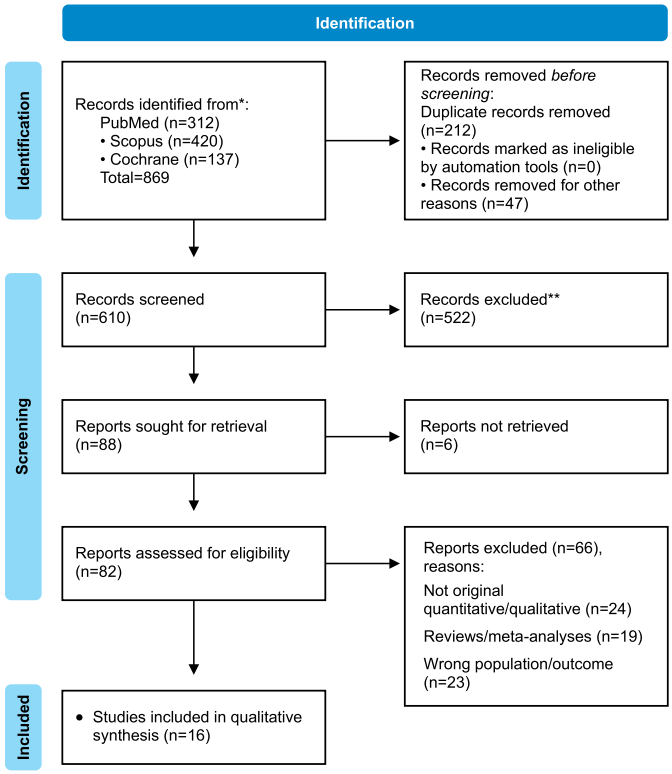

Figure 1: Flowchart of the Study Selection Process, Showing Identification, Screening, Eligibility Assessment, and Inclusion of Studies for Analysis

RESULTS

A total of 16 studies were included, spanning diverse regions, with strong representation from Asia (Japan, Taiwan, Singapore, Pakistan), North America (USA), Africa (South Africa, Ghana), and one study from the Middle East (Pakistan). Study designs varied, including qualitative interviews and focus groups [12, 13], quantitative cross-sectional surveys [14-16], pre-post or quasi-experimental designs [17-19], and mixed-methods approaches [20-22]. Sample sizes ranged from small cohorts (22–45 students in Ohta's rural islands and Lu's study) to large multi-institutional surveys (over 200 students in Thomson and Burton). Across interventions, short-term rural CBME placements in Japan [23-25] consistently emphasized orientation to general medicine and rural practice, while project-based or hybrid service-learning courses in Taiwan, Singapore, and the USA [17, 18, 26] focused on empathy, reflective practice, and readiness to serve underserved communities. Community outreach models (Kamal in Pakistan, Burton and Rodriguez in the USA; Ampofo in Ghana) highlighted clinical skill development, patient engagement, and reciprocal benefits to communities [14, 22, 27, 28]. Programs introduced during the COVID-19 pandemic [24], underscored adaptability, professional identity formation, and communication skills in modified SL formats. Overall, the evidence shows that CBME and SL are consistently linked to student growth in clinical competence, empathy, and professional identity, while simultaneously fostering community engagement and health awareness. However, most studies were short-term and cross-sectional, limiting conclusions about long-term outcomes or sustainability. Institutional-level impacts such as curricular reform or reputation were rarely measured systematically, representing an important evidence gap (Table 1).

Table 1: Characteristics of Included Studies (Undergraduate Medical Students; 2017–Aug 2025)

Sr. No.	References	Country/ Region	Study Design	Sample Size (n)	Participants	Intervention (SL/CBME)	Duration	Reported Goals/Outcomes
1	[12]	South Africa	Qualitative (Focus Groups)	54	Undergrad Medical Students	Community-Based Placements Integrated with 2 Curriculum	Rotation Block	Relevance of Cbme to Learning, Teamwork, and Community Orientation.
2	[13]	Japan (Rural)	Mixed-Methods	54	5th–6th Year Med Students	Two-Week Rural CBME Generalist Course	2 Weeks	Improved Attitudes Toward General Medicine, Rural Practice, and Community Health.
3	[14]	USA	Cross-Sectional	186	Med Students (Volunteers vs. Non-Volunteers)	Student-Led Vision Screening (Service-Learning)	Ongoing	Volunteers Gained Confidence in Ophthalmology Skills and Patient Engagement.
4	[15]	USA	Cross-Sectional (Multischool)	246	Med Students	Participation in Student-Run Free Clinics (SL)	Ongoing	Benefits in Service-ILearning, Interprofessionalism, Early Patient Exposure.
5	[16]	Taiwan	Cross-Sectional	135	1st-Year Med Students	Project-Based Service-Learning (Pandemic-Adapted)	1st Semester	Improved Communication, Professionalism, and Learning Effectiveness.
6	[17]	USA	Pre-Post Quantitative	102	1st-Year Med Students	Hybrid Service-Learning in Medical Humanities	1st Semester	Increased Readiness for Underserved Care, Improved Community Attitudes.
7	[18]	USA	Quasi-Experimental	93	Early Med Students	Mandatory Team SL + uided Reflection	1st Semester	Significant Increases in Cognitive Empathy and Reflective Capacity.
8	[19]	Japan (Urban)	Pre-post Design	84	Undergrad Med Students	Urban CBME Placements	Course Block	Improved Understanding and Attitudes Toward Community Healthcare.

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9	[20]	Singapore	Mixed-Methods	38	Medical Students	Service-Learning with Migrant Workers (6 Cycles)	Multi-Session	Nurtured Empathy, Peer Learning, and Collaborative Skills.
10	[21]	USA	Mixed-Methods	45	Med Students (UG Level)	COVID-19 SL Elective (Community Projects)	Elective Term	Professional Identity Formation, Leadership, and Partnership Skills.
11	[22]	Ghana	Cross-Sectional	303	4th-year Med Students	Service-learning Embedded in Community Health Clerkship	Clerkship Block	>90% Valued Program; Improved Engagement Skills and Social-11 Determinants Awareness.
12	[23]	Japan (Islands)	Qualitative (Interviews)	22	Undergrad Med Students	Rural Island CBME Immersion	2 Weeks	Deeper Understanding of Local Resources, Interconnections, and Primary-Care Practice.
13	[24]	Japan (Rural)	Cross-Sectional Survey	128	Rural-Track Med Students	General Medicine CBME Exposure	Multiple Course Blocks	Identified Factors Shaping Perceptions of General 16 Medicine and Rural Practice.
14	[25]	Pakistan	Prospective (Non-Comparative)	64	Undergrad Med Students	CBME Via Ophthalmology Medical Camps	4-Hour Intensive	Gains in Focused History-Taking, Exam, Patient Counseling; Improved Confidence.
15	[26]	Taiwan	Longitudinal Quantitative	70	3rd-Year Med Students	Preclinical Service-Learning Linked to Clerkship	1st Year	Service-Learning Associated with Higher Empathy (perspective-taking, Compassion).
16	[27]	USA	Program Evaluation	79	Med Students	Student-Led Eye-Health Community Outreach	Multi-Event	Improved Eye-Health Knowledge and Reinforced Community Service Goals.

The synthesis of 16 studies highlighted three main domains of goals linked to SL and CBME: educational outcomes for students, community benefits, and institutional priorities. Educational goals for students were the most frequently reported. Several studies [14, 27, 28] report improvements in clinical competence, with students gaining confidence in history-taking, examination, and patient counseling through medical camps and vision screening programs. Other studies [12, 21, 25] emphasize professional identity formation, noting stronger student responsibility and community orientation after rural and urban placements. Programs integrating guided reflection [18, 20, 26] demonstrate measurable growth in empathy and reflective practice, while others [15, 17, 22] highlight the role of SL/CBME in fostering social accountability, particularly awareness of underserved populations and social determinants of health. At the community level, outcomes include improved healthcare access through vision care and outreach initiatives [22, 27, 28], as well as stronger partnerships with local organizations and community stakeholders [20-22]. Studies in rural Japan [24, 27] demonstrate how CBME contributes to trust-building and sustainability by preparing students for generalist and rural practice. At the institutional level, several studies [12, 16, 25] indicate that CBME and SL enhance curricular relevance, aligning medical education more closely with community needs. Others [15, 18] emphasize interprofessional collaboration, with students working in team-based and clinic settings. Institutions engaged in community programs [21, 22] also strengthen their reputation and social accountability, reinforcing their role as partners in public health. Overall, the evidence indicates that SL and CBME foster competent, empathetic, and socially responsible medical graduates, while simultaneously benefiting communities and strengthening institutional credibility (Table 2).

Table 2: Thematic Synthesis of Goals of Service Learning (SL) and Community-Based Medical Education (CBME)

Themes	Sub-Themes	Representative Studies	Reported Goals / Outcomes
Educational Goals for Students	Development of Clinical Competence	[27, 28]	Improved History-Taking, Examination, Patient Counseling, Ophthalmology/Vision Care, and Eye Health Knowledge.
	Professional Identity Formation	[21, 25]	Growth of Student Professional Roles, Understanding Community Healthcare Responsibilities, Sense of Accountability.
	Reflective Practice and Empathy	[26, 20]	Increased Empathy (JSPE), Compassion, Self-Reflection, and Bias Mitigation through Structured Reflection.
	Social Accountability Awareness	[15, 22]	Heightened Awareness of Underserved Needs, Social Determinants of Health, and Commitment to Service.
Community Goals	Improved Access to Healthcare	[14, 27]	Expanded Access to Vision Screening, Eye Care, and Ophthalmic Outreach; Enhanced Community Health Education.
	Strengthening Community Partnerships	[21, 22]	Collaborations with Community Organizations; Reciprocal Benefits for Both Community and Students.
	Building Trust and Sustainability	[23]	Trust-Building in Rural Communities; Sustainable Pipeline for General Medicine and Rural Practice.

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Institutional/ Faculty Goals	Enhancing Curricular Relevance	[16, 25]	Demonstrated that Cbme/SL makes Curriculum more Applicable to Real-World Settings and Community Needs.
	Promoting Interprofessional Collaboration	[18, 15]	Student-Run Clinics and team Service-Learning Encouraged Collaboration across Disciplines.
	Building Institutional Reputation	[21, 22]	Institutions Seen as Socially Accountable and Engaged with Local Communities; Improved Visibility and Credibility.

The Venn diagram (Figure 2) illustrates how SL and CBME operate at multiple levels. Educational goals center on developing competence, empathy, and professional identity. Community goals emphasize healthcare access, reciprocity, and sustainability. Institutional goals focus on curricular relevance and social accountability. The overlaps demonstrate that these domains are interdependent, with outcomes such as social accountability benefiting both students and communities, while curricular relevance and partnerships connect institutional and community roles. Together, they underscore that SL and CBME not only prepare socially responsible graduates but also deliver tangible community impact and strengthen institutional credibility. Venn diagram illustrating the thematic synthesis of goals associated with SL and CBME. The three domains, educational goals for students, community goals, and institutional goals, overlap to highlight shared outcomes such as social accountability, curricular relevance, and partnerships and trust (Figure 2).

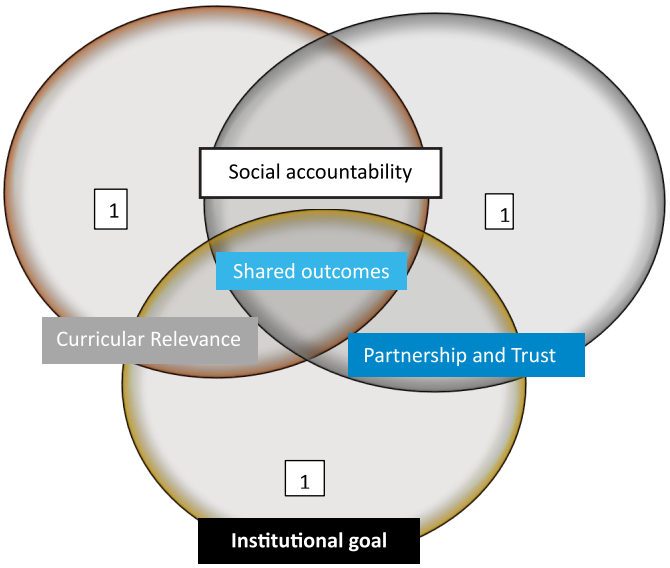

Figure 2: Venn Diagram Showing How SL and CBME Intersect Educational, Community, Institutional Goals, Highlighting Shared Outcomes Like Social Accountability, Partnerships, and Community Impact

The majority of included studies were rated as moderate to high quality, with none classified as low quality. Qualitative research [12, 29] generally demonstrated strong alignment with CASP criteria, though some had limited reflexivity, leading to moderate ratings. Mixed-methods studies [20, 21, 22] performed well on MMAT, showing methodological rigor and integration of qualitative and quantitative components. Quantitative and cross-sectional designs [14, 17, 24, 27] were more frequently rated as moderate, reflecting common limitations such as small sample sizes and limited generalizability. Overall, the quality assessment supports confidence in the thematic synthesis, though future studies would benefit from more robust designs and longitudinal evaluations (Table 3).

Table 3: Quality Assessment of Included Studies

References	Study Design	Appraisal Tool	Quality Rating
[12]	Qualitative (Focus Groups)	CASP	High
[13]	Mixed-Methods	MMAT	Moderate
[14]	Qualitative (Interviews)	CASP	Moderate
[15]	Longitudinal Quantitative	JBI (Cross-Sectional/ Longitudinal)	High
[16]	Mixed-Methods	MMAT	High
[17]	Pre-Post Quantitative	JBI	Moderate
[18]	Quasi-Experimental	JBI	High
[19]	Cross-Sectional	JBI	Moderate
[20]	Prospective (Non-Comparative)	JBI	Moderate
[21]	Cross-Sectional (Survey + Open-Ended)	MMAT	High
[22]	Mixed-Methods	MMAT	High
[23]	Pre-Post Design	JBI	Moderate
[24]	Cross-Sectional	JBI	High
[25]	Cross-Sectional (Multischool)	JBI	High
[26]	Cross-Sectional Survey	JBI	Moderate
[27]	Program Evaluation	JBI	Moderate

High quality = clear aims, rigorous methodology, appropriate analysis, well-reported outcomes, Moderate quality = some limitations (e.g., small sample size, limited generalizability, unclear reflexivity), and Low quality (none in our included set) would indicate major flaws in design or reporting.

Analysis of the included studies shows that the majority emphasize educational outcomes for students, particularly gains in clinical competence, empathy, professional identity formation, and social accountability. Three studies [14, 27, 28] report measurable improvements in clinical skills such as history-taking, examination, and patient counseling through medical camps and community screenings. Others [12, 21, 25] describe professional identity growth and a stronger sense of responsibility after placements in rural or urban community settings. Studies by Yang, Van Winkle, and Sin consistently demonstrate

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positive effects on empathy and reflective capacity, although the sustainability of these outcomes beyond training was not assessed [18, 20, 26]. Programs in Ghana, the USA, and Singapore further highlight the role of service learning in fostering awareness of social determinants of health and readiness to serve underserved populations. Community-level outcomes were also frequently described. Initiatives in Pakistan, Ghana, Singapore, and the USA report improved healthcare access and stronger partnerships with local organizations, though most rely on student perceptions rather than direct measures of community benefit. Studies from rural Japan uniquely emphasize trust-building and sustainability, suggesting that CBME may encourage future workforce distribution toward underserved areas. However, evidence from other regions on long-term community benefit remains limited. Institutional-level outcomes were the least studied. While some studies [12, 16, 25] show that SL and CBME improve curricular relevance and contextual learning, and others [15, 18] report enhanced interprofessional collaboration, few systematically address institutional reputation or accountability. Overall, findings indicate that SL and CBME consistently strengthen student learning and community engagement, but notable gaps remain in longitudinal evaluation, objective measures of community impact, and assessment of institutional change.

DISCUSSION

The present synthesis showing that SL/CBME most strongly targets student learning outcomes (competence, empathy, identity), with additional community and institutional benefits tracks closely with recent literature. For student-level gains, newer studies continue to report improved empathy, reflective capacity, and readiness for service when SL is structured with guided reflection and authentic community roles. A recent post-clerkship Health Systems Science course integrating service-learning reported meaningful professional development and highlighted the importance of distinguishing SL from community service or volunteering to maintain educational integrity, mirroring the emphasis on structured reflection in this review [28] Likewise, a 2025 study of community-based problem-based learning (CB-PBL) in rural Japan showed improvements in students' understanding of community health, personal/professional growth, and engagement with rural needs paralleling the rural CBME effects observed in your included Japanese studies [29]. Evidence from student-run free clinics (SRFCs) further reinforces the pattern of skill gains and service orientation. A 2024 analysis found that SRFC participation bolstered confidence in clinical and interpersonal skills and preparedness for clerkships, aligning with findings from vision-screening and outreach models in your set [30]. Beyond self-reported learning, an education-economics evaluation estimated substantial educational value and an 8:1 benefit-cost ratio for an SRFC, suggesting institutional and learner returns that complement the competence gains you observed [31]. Newer community-engaged curricula also echo the dual-benefit model. In Ghana, a structured, course-embedded approach reported high student valuation and leadership/engagement gains consistent with your findings on social accountability and partnership building, though still short on population-level outcomes [32]. A 2024 mixed-methods SL curriculum report emphasized social justice awareness and durable service commitment through close work with community partners, reinforcing the partnership/reciprocity sub-themes in this review [33]. The COVID-era SL adaptations in the literature also align with this review's observations about adaptability and identity formation. A 2024 study of a SL elective documented positive effects on professional identity formation and learning, paralleling pandemic-adapted, project-based SL in your dataset [22]. Institutional-level outcomes remain under-measured; a gap echoed in contemporary sources. Recent program reports and surveys describe enthusiasm for CBME and explicit social accountability aims, yet identify structural barriers to faculty development, cross-sector collaboration, and curricular embedding as limiting sustained impact [34]. Emerging work does suggest institutional promise: for example, SRFC cost-value data imply a path to demonstrate return on educational investment, and health-systems SL courses frame SL as part of mission-aligned, system-aware training, but these remain exceptions rather than the rule [31]. Two cross-cutting issues in the recent literature mirror the gaps in this review. First, short-duration and cross-sectional designs dominate, limiting insight into the durability of empathy, identity, or community outcomes [33]. Second, community impact is commonly inferred from student self-reports rather than objective metrics (service utilization, disease control, longitudinal access indices). Some newer work begins to address community-facing education and empowerment within CBME, suggesting potential for measurable patient outcomes, but rigorous community indicators remain rare [35]. Finally, the scope is broadening geographically. Global CBME initiatives report growth in understanding of social determinants and community-driven approaches, consistent with the global South/North blend in your results; at the same time, national surveys (e.g., South Korea) reveal system-level needs to integrate CBME as a continuous curricular thread [32]. In summary, this review and the recent literature indicate that well-structured SL/CBME reliably advances student competence, empathy, and professional identity, while fostering community partnership and offering a

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rationale for institutional relevance. The field now benefits from contemporary exemplars health-systems SL, CB-PBL in rural settings, and SRFC evaluations but still lacks longitudinal designs, objective community health metrics, and explicit institutional outcome tracking. Addressing these gaps will clarify sustainability, inform curriculum and accreditation, and help align medical education with social accountability goals. New studies should pair reflective pedagogy with robust evaluation frameworks that capture student trajectories, community outcomes, and institutional change over time.

CONCLUSIONS

This systematic review demonstrates that service learning (SL) and community-based medical education (CBME) consistently foster key educational outcomes among undergraduate medical students, including enhanced clinical competence, empathy, reflective capacity, and professional identity formation. These interventions also promote meaningful community engagement and health awareness, while supporting institutional priorities such as curricular relevance and social accountability. However, the current evidence base is limited by predominantly short-term and cross-sectional study designs, with insufficient emphasis on long-term community benefits or institutional transformation. Future research should adopt longitudinal, multi-institutional designs to evaluate program sustainability and broader systemic impact.

Authors Contribution

Conceptualization: HW
Methodology: HW, FP
Formal analysis: HW, MAK
Writing review and editing: MK, FP, PZ, MAK, SSF

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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