

REVIEW ARTICLE

Transformation of medical education through Decentralised Training Platforms: a scoping review

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ABSTRACT:

Introduction: Medical education in South Africa is facing a major paradigm shift. The urgency to increase the number of suitable, qualified and socially accountable health sciences graduates has brought to the fore the need to identify alternative training platforms and learning environments, often in rural areas. Subsequently, the focus has now shifted towards strengthening primary health care and community based health services. This scoping review presents a synopsis of the existing literature on decentralized training platform (DTP) strategies for medical education internationally, outlining existing models within it and its impact.

Methods: This scoping review followed Arksey and O'Malley's framework outlining five stages: (i) identification of a research question, (ii) identification of relevant studies, (iii) study selection criteria, (iv) data charting, and (v) collating, summarizing and reporting results. The literature for the scoping review was found using online databases, reference lists and hand searched journals. Data were charted and sorted inductively according to key themes.

Results: A final review included 59 articles ranging over the years 1987–2015 with the largest group of studies falling in the period 2011–2015 (47.5%). Studies mostly employed quantitative (32.2%), qualitative (20.3%), systematic/literature review (18.6%) and mixed methods research approaches (11.9%). The scoping review highlighted a range of DTP strategies for transforming medical education. These include training for rural workforce, addressing context specific competencies to promote social accountability, promoting community engagement, and medical education partnerships. Viable models of DTP include community based education, distributed community engaged learning, discipline based clinical rotations, longitudinal clerkships and dedicated tracks focusing on rural issues. Shorter rural placements and supplemental rural tracks are also described.

Conclusions: This scoping review showed a considerable amount of literature on decentralized training platforms that highlight the necessary adaptations needed for transforming medical education. The rural context is critical for many of these. Further studies are required to address the impact of DTPs on health service outcomes and human resource outcomes.

KEYWORDS:

community based education, decentralized training platform, health system, medical education, rural practice, rural training, social accountability, South Africa, transformation

FULL ARTICLE:

Introduction

Sub-Saharan African countries continue to face challenges in regard to general population health improvement, health systems strengthening and the education of health professionals¹⁻⁴. Scanning the literature, it is clear that increasing attention is being paid to the need to transform medical education through the development of relevant skills and

competencies that are able to address patient and community needs relevant to their contexts and to strengthen health systems^{1,2,5-7}. There are constraints in South African medical training that limit academic institutions from meeting the needs of the country⁸. The challenges are systemic as the absolute number of graduates that are produced per annum is not enough to respond to the country's needs, and medical schools are centered around large tertiary hospitals in the cities. In addition, there is a skewed distribution of healthcare professionals, as most favour placement in urban based health facilities for a range of personal and professional reasons.

Like many other countries, South Africa is facing a paradigm shift with regard to identifying suitable training platforms and learning environments for medical education that would produce a more suitable graduate. Health personnel will be regarded as being 'fit for practice'¹, and socially accountable⁹, if they are able to address the health needs of the communities they serve. The focus for medical education is thus shifting towards strengthening primary health care and community based health services¹⁰. In particular, Kent and De Villiers¹⁰ accentuated the importance of medical education that produces health professionals ready to practice in rural and remote areas, and there has been a move towards this in the country¹¹.

Transformative learning acknowledges the importance of context, relationship formation between students and society, and experiential learning¹²⁻¹⁴. As such, transformative learning can occur by indulging in community activities that will positively affect the health of the population¹⁵. Rudolf et al. emphasized the value of planning student activities with the communities where students are involved in service learning¹⁶.

Although there are clear gaps with regard to graduate competencies and meeting health system needs, medical schools are considered critical in transforming medical education by supporting a shift away from tertiary education towards decentralized training platforms (DTPs)¹⁷. Studies have been conducted showing how DTPs have been used as an approach to train a greater number of suitably trained health professionals who are more likely to remain in the underserved health sector¹⁸. DTPs allow for an understanding of the context and local needs in which learning occurs, which in turn assists in addressing relevant competencies¹⁹. Through decentralized platforms, understandings of context, culture and community are strengthened and social responsibility is encouraged through student involvement in community based projects and service learning activities²⁰.

This study is part of a larger study entitled 'Transformation of medical education in South Africa (TIME-SA)' led by the University of Kwa-Zulu Natal. The other collaborating partner universities include Walter Sisulu, Sefako Makgatho and Witwatersrand universities. This scoping review focused on the thematic area that highlights suitable training platforms and learning environments as one way of fostering the transformative agenda in medical education. Therefore, this scoping review aimed to present a synopsis of the existing literature on DTP strategies for medical education, outlining existing models within it and its impact. The specific objectives were to identify DTP strategies in medical education, outline the existing models of DTPs, and highlight their capacity for realising academic, service and social learning agendas.

Methods

This study utilized a scoping review approach to collate literature on decentralized training platforms. It followed Arksey and O'Malley's framework, which outlines the following five stages of conducting a scoping review: (i) identification of a research question, (ii) identification of relevant studies, (iii) study selection criteria, (iv) data charting, and v) collating, summarizing and reporting results²¹.

Stage 1: Identification of a research question

This review was guided by the following research question: what are the existing models of DTPs within medical education and what capacity do they have for realizing academic, service and social learning agendas?

Stage 2: Identification of relevant studies (searching literature)

Literature was searched using different sources such as online databases, reference lists and hand searched journals (manual search of literature in journals). The online database search was conducted using Cochrane library, Wiley

online library, PubMed, Ebscohost, ERIC, Science Direct and Springer Link. A search strategy was developed based on the research question outlined above. The original search comprised word strings/word phrases, outlined in Table 1.

Further literature was obtained by checking the reference section of articles retrieved from the online databases and through hand searching journals deemed appropriate by the authors, namely *African Journal of Health Professions Education*, *African Journal of Primary Health Care and Family Medicine*, *Australian Journal of Rural Health*, *Journal of Family Health*, *Medical Teacher*, *Medical Education*, *Rural and Remote Health*, *South African Journal of Higher Education*, *South African Family Practice* and *The Journal of Rural Health*.

Table 1: Word strings/word phrases used in original literature search to identify existing models of decentralized training platforms within medical education

Decentralised	Community	Primary health care	Transformative learning
<ul style="list-style-type: none"> • Decentralised training platform AND/OR medical education • Decentralised medical training • Decentralised medical education • Decentralised training AND/OR competent medical graduate • Decentralised medical teaching • Decentralised medical teaching AND/OR social accountability • Decentralised training platform AND/OR situated learning • Decentralised training platform AND/OR experiential learning 	<ul style="list-style-type: none"> • Community-engaged medical education • Community-oriented medical education • Community-based medical education • Community-based medical rotations/ clerkships • Community-oriented medical teaching • Community training platforms AND/OR medical education • Community training and competent medical graduate • Community medical teaching AND/OR social accountability 	<ul style="list-style-type: none"> • Primary health care training platform AND/OR medical education • Primary health care training platform AND/OR competent medical graduate • Primary health care training platform AND/OR rotations/ placements • Primary health teaching platform • Primary health teaching platform AND/OR social accountability • Clinical placements AND/OR situated learning 	<ul style="list-style-type: none"> • Transformative learning platforms AND/OR medicine • Transformation AND/OR medical education • Transformative medical teaching platforms • Transformation AND/OR community medical teaching • Transformation AND/OR emergency medical teaching platforms • Transformation AND/OR decentralised learning in medicine • Transformation AND/OR primary health training platforms • Transformative learning AND/OR social accountability in medicine

Stage 3: Study selection: inclusion and exclusion criteria

Articles were excluded if the title and abstract did not reflect the key word strings. Inclusion was based on all titles that referred to decentralization in the context of medical education, medical students, service delivery, governance, management and economics, and health services. The inclusion criteria were not limited by year and study design, to allow for a wider body of literature. All articles written in English, with a relevant title and abstract, for which full text articles could be obtained, were included in the study. Titles and abstracts were independently screened by two research assistants. Full text articles were later reviewed independently by three different reviewers (MM, AD and RD). In order to resolve any article screening and review discrepancies among reviewers, ongoing meetings took place throughout the review process²².

Stage 4: Charting of data: presentation of results

To keep track of records retrieved during the scoping review, all the extracted full text articles were managed using Endnote bibliographic software. An inductive analysis approach was used to chart and sort the data according to key themes. A data charting form was developed to capture information from various sources according to author, year, publication type, sector, aim, setting, type of study, methodology and study outcomes. Data was captured on Microsoft Excel, 2013. Descriptive analysis for study characteristics was conducted using Statistical Package for the Social Sciences v23 (SPSS; <http://www.spss.com>).

Stage 5: Collating, summarizing and reporting results

The scoping review findings were described narratively to provide insight regarding the content of each article.

Ethics approval

The scoping review was conducted as part of a larger study whose protocol was approved by the University of the

Results

Overview of results

The initial comprehensive search process, which involved doing multiple searches using the broad search terms (word strings) listed in Table 1 within the various electronic databases described, yielded more than a million articles. The a priori decision was taken to focus on only the first 100 articles per search, sorting by relevance, as described in the review of scoping reviews by Pham et al²³; using this approach yielded 12 923 articles. In cases where less than 100 articles were retrieved from a database (as part of the initial search), all articles were screened. Title screening was then carried out for these articles: 12 428 articles were excluded and 190 duplicate articles were removed. An additional 55 articles were obtained from reference lists of key reviews and hand-searched articles. Following title screening, 360 abstracts were reviewed against inclusion and exclusion criteria and 301 abstracts were found to be irrelevant. Thus 59 relevant articles were included for a full review, analysis and synthesis (Fig1).

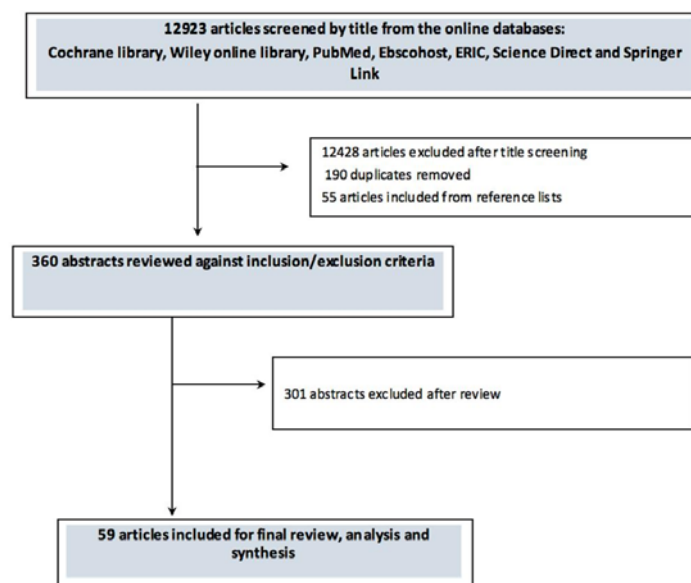


Figure 1: Article selection process for review of existing models of decentralized training platforms within medical education.

Characteristics of studies included in the scoping review

The publication dates of articles retrieved in this scoping review ranged from 1987 to 2015, with the largest group of studies falling in the period 2011–2015 (47.5%). Most of the studies were conducted in Australia (25.4%) followed by the USA (16.9%) and South Africa (16.9%). Studies mostly employed quantitative (32.2%) and qualitative methods (20.3%) only (Table 2).

The contents of the retrieved articles covered three broad themes in relation to the scoping review research question. The results for each of the 59 articles are charted according to these themes:

- DTP strategies for transforming medical education
- DTP impact on academic, service and social learning
- Models of DTP within medical education.

Table 2: Publication period, country and methodology for review of existing models of decentralized training platforms within medical education

Publication period, country and methodology	N	%
Year of publication		
1987–1990	1	1.7
1991–2000	5	8.5
2001–2010	25	42.4
2011–2015	28	47.5
Countries of origin		
Australia	15	25.4
USA	10	16.9
South Africa	10	16.9
Canada	5	8.5
UK	4	6.8
Other countries, which accounted for one study each (Pakistan, Israel, Japan, Indonesia)	4	6.8
Uganda	3	5.1
Other African countries, which accounted for one study each (Zimbabwe, Nigeria, Kenya)	3	5.1
Tanzania	2	3.4
Ireland	2	3.4
Collaborative study between USA and Canada	1	1.7
Study approach and design		
Quantitative approach only	19	32.2
Qualitative approach only	12	20.3
Systematic review/literature review studies	11	18.6
Mixed methods approach	7	11.9
Commentaries	6	10.2
Conceptual frameworks	4	6.8

DTP strategies for transforming medical education

Thirty-one studies explored the necessary approaches for transforming medical education and they recommended the following elements as being of strategic importance in the use of decentralized training platforms.

Rural workforce training: Fourteen studies discussed the training of rural workforce as a viable strategy for addressing medical education transformation. Murray et al. recommended policy interventions that address rural medical workforce needs such as funding provision for rural scholarships purposes, creation of ‘rural clinical school campuses and regionally based medical schools’, encouraging the selection of students from rural areas, and establishment of ‘rural-health clubs’ at universities for students to create interest in rural health¹⁷. Similarly, other studies highlighted selection criteria in favour of students from underserved areas as being vital for increasing a medical workforce that is relevant to the context^{16,24-29}.

Strategies for increasing rural origin enrolments in medical schools include having educational initiatives for both high schools and universities (through outreach programs), providing science and health programs during school vacations, funding scholarships for rural education and reviewing admission process³⁰. Recommendations for raising rural physician numbers include increasing rural undergraduate and postgraduate training, acknowledging that the selection of location of practice depends on ‘personal and professional preferences’, financial and community factors, policy change on admission requirements and involvement of rural physicians in education provision³¹. Exposure to rural training equips students with enough experience to address context specific problems³²⁻³⁵. A review study also showed that rural medical school programs can address the health systems’ need for increasing the rural workforce³⁴.

Context specific competencies and social accountability: Five studies highlighted the importance of developing context specific competencies as a way of promoting social accountability. Transformative learning in medical schools cannot be separated from social accountability, and a community consultative process is important for assessing the rural training of health professionals³⁶. Having a social accountability mandate for the institution provides opportunities for community engagement that strategically contribute to the successful learning experiences of students at rural clinical schools³⁷. Emphasis is placed on the need for capacitating educators to be change agents by encouraging peer mentoring, supporting innovations and providing educational scholarships³⁸. Peer mentoring is necessary for

augmenting learning and fostering leadership among students³⁹. The 2010 Lancet Commission report on health professions education also highlighted a need for system based education in the 21st century that fosters adaptation of professional competencies that are specific to the rural context². This report favoured DTPs that are located closer to rural communities, and the recruitment of rural origin students.

Community based education and community engagement: Six studies discussed community based education as an approach for strengthening and transforming medical education, suggesting that even in low resource countries it is possible for student learning to be enhanced in a context specific environment. Two studies reported that regardless of factors that affect the implementation, community based education continues to provide a viable alternative for educating health professionals in the 21st century^{40,41}. One study provided recommendations for community oriented primary care, which emphasized community involvement, health services integration, community workers' involvement and departmental involvement⁴². Teal et al proposed the engagement of community based provider organizations in early start-up and implementation to promote effectiveness and to inform policy decisions at community level⁴³. Community engagement in planning the curriculum is also seen as a necessary requirement for transforming medical education¹⁶. Another study recommended using information and communication technologies (ICT) to foster community engaged scholarships⁴⁴.

Medical education partnerships: Four studies focused on partnerships as a way of improving medical education in decentralized training platforms. Educational partnerships such as the Medical Education Partnership Initiative (MEPI), a US-funded program to support the development of medical education in Africa, have the potential to support DTPs. One MEPI-funded project facilitated the participation of medical students in rural rotations, and improvements were found in community based training⁴⁵. Overall, the MEPI program was seen to contribute by producing graduates that are fit for purpose⁴⁶. Collaborations and lesson sharing among medical schools increases accountability to the health system⁴⁷. A symbiotic approach is encouraged for relationship building between academic institutions and health services¹⁷.

DTP impact on academic, service and social learning

Thirty-two studies highlighted students' perceptions and experiences of training and practicing on rural decentralized training platforms.

Medical students' experiences and perceptions of training and practicing on a rural platform: Varying views were found from several studies regarding the link between training and practicing on a rural platform. Three studies highlighted that although students had positive perceptions of rural physician expertise and the services they provide, there was no positive correlation between rural exposure, being of rural origin and having an interest in rural practice^{28,35,48}.

On the other hand, eight studies revealed a positive correlation between rural exposure, rural origin and having interest in rural practice. For instance, some studies found that medical students had an interest in rural practice because of their rural attachment experiences^{32,49}. Other studies found greater interest in rural practice following exposure to a rural clinical school⁵⁰⁻⁵³. Two studies highlighted positive experiences of rural placements among students, which included acquisition of relevant clinical skills for service provision^{54,55}. Three studies found that students preferred longer placements in rural clinical schools because of patient-centeredness⁵⁶⁻⁵⁸.

Other studies have indicated that choosing a rural practice location is influenced by personal needs such as wanting to be near family or being in a familiar town and spouse needs^{59,60}. Rural preceptorship was found to have an influence on specialty selection^{61,62}.

Varying views on learning spaces were also found. Widyandana et al showed that primary health care is recommended by medical students as the best place to learn clinical skills⁶³, whilst it was also found that district general hospitals were more preferred than tertiary hospitals⁶⁴. The high preference for district general hospitals by students and the teaching staff is due to their ability to provide longer patient exposure, which leads to improvement in patient care^{65,66}. Daly et al highlighted the learning spaces that occur within rural placements, such as learning about personal roles,

experience environment and connection between students and learning spaces⁶⁷.

DTP impact on community and rural practice: Five studies showed the impact of training and practicing on a rural platform. One study showed that exposure to rural or regional postgraduate training provides postgraduate students with good learning experiences³⁰. Bicket et al found that motivators for students' engagement were linked to their need to contribute to the community⁶⁸. Students were empowered by responsibility and clearly defined roles, allowing them to have meaningful connection with others⁶⁸. Training on a rural platform provided students with an understanding of health care and how it is delivered in the community⁶⁹. A study on students' experiences of innovative rural education found benefits of rural clinical schools came about because they contribute to the development of leadership qualities and that students acknowledged their role as a healer when they worked with patients³⁶. Community based education has been found to have a great impact on communities and student engagement in community work. Short term benefits included improvement of services, decreased referrals, home visits, provision of primary healthcare services that are community oriented, communication improvement and professionalism⁷⁰. Long term benefits included improved teaching and familiarity with the healthcare system and student engagement in community work⁷⁰.

Three studies explored the unique learning opportunities that are provided by DTPs. Daly et al highlighted that because cultural awareness is supported, students are better prepared to practice in a particular context⁷¹. Another study concurred that learning takes place at the level of both clinical skills and 'personal and professional development'⁷². Jinadu et al indicated that because the learning is more experiential, primary healthcare education seems to provide better learning to graduates compared to the 'traditional medical schools'⁷³.

Models of DTPs within medical education

This scoping review offers a variety of models for DTPs within medical education (Table 3). It reflects that rural clinical schools mostly use longitudinal integrated clerkships, whereby students are placed in a district hospital or general practice for extended periods, most often being of 1 years' duration^{33,35,36,39,57,58,71,74}. Rural clinical school training also includes offering training in a rural site, recruiting students from rural areas and having repeated rural exposure⁴⁹. Some models of DTPs include distributed community engaged learning, which takes place in both community and classroom settings. This includes having multiple short term placements in communities, with classroom based reflection and learning interspersed between them³⁷. Many community based education models range from 4- to 8-week placements, involving students spending time in community health centers and rural communities^{41,45,69,73}.

Some studies describe a mix of three clinical practice placements such as general practice placements (2–4 sessions per week), hospital placements and remote placements (4-week placements in a remote area) during the third, fourth and fifth year of study^{64,66,71,75}. Other placement models include urban medical schools having rural clinical placements over 6 weeks in primary healthcare settings⁸.

Doherty highlights varying models for rural training of health professionals³³. These include comprehensive rural programs with curricula that are more focused on issues affecting rural communities, dedicated rural track programs within urban based institutions with lengthy placements in a rural environment, rural tracks that are offered as part of traditional programs, and supplementary rural tracks whereby students participate in a rural placement as an additional activity.

Table 3: DTP models with medical education identified by review

Author	Year	DTP model	Model aspects
Vaz and Gona	1992	Rural primary health care attachment	<ul style="list-style-type: none"> 3-week rural primary healthcare attachment of medical students
Fryer et al.	1994	Community based education	<ul style="list-style-type: none"> 1st-year students – 1-week attachment in a rural site 2nd-year students – community attachment 3rd-year students – integrated clerkship 4th-year students – rural community attachment
Jones and Helbren	2000	Community based education	<ul style="list-style-type: none"> 4-week clerkship in rural primary care during 4th year
Johnston and Boohan	2000	Community based education	<ul style="list-style-type: none"> 1st- and 2nd-year students – general practice surgery/hospital attachment for one semester
Sturmberg et al.	2001	Community based medical education	<ul style="list-style-type: none"> Student placements in a rural location
Jinadu et al.	2001	Community based education	<ul style="list-style-type: none"> 4–8-weeks' placement in community
Parry et al.	2002	Community based education	<ul style="list-style-type: none"> 4th- and 5th-year students – district general hospital attachments
Dunbabin and Levitt	2003	Community based education	<ul style="list-style-type: none"> Rural medical education
Hsueh et al.	2004	Community based education	<ul style="list-style-type: none"> Community based teaching Rural clerkships
Blue et al.	2004	Community based education	<ul style="list-style-type: none"> 4-week rural primary care clerkship for 3rd-year students
Rourke	2005	Community based education	<ul style="list-style-type: none"> Rural and regional training rotations
MacDonald	2005	Community based education	<ul style="list-style-type: none"> Medical student clinical attachment to district general hospitals
Jones and Helbren	2007	Community based education	<ul style="list-style-type: none"> Hospital placements for 3rd-year students
Wilson and Cleland	2008	Community based education	<ul style="list-style-type: none"> Clinical block hospital placement 4th-year student attachment at a general practice
Strasser and Neusy	2010	Distributed community engaged learning	<ul style="list-style-type: none"> Learning through cases Community based medical education Rural based medical education using preceptorship model Learning takes place in both community and classroom
Maley et al.	2010	Longitudinal clerkships	<ul style="list-style-type: none"> Rural community placements for 1 year
Krahe et al.	2010	Rural clinical school	<ul style="list-style-type: none"> 4-week rotation in a rural setting (shorter term) 1-year clinical rotation in a rural setting (longer term)
D'Amore et al.	2011	Community based education	<ul style="list-style-type: none"> 1st-year students are exposed to 1-week attachment in a rural hospital, community health centre, home visits etc. 2nd-year students are exposed to 2-week attachment in a rural clinical site 3rd- to 5th-year students are exposed to 5 weeks in a rural clinical site
Widyandana et al.	2011	Community based education	<ul style="list-style-type: none"> Primary healthcare attachment
Doherty	2011	Community based education Rural tracks Rural placements Supplementary rural tracks	<ul style="list-style-type: none"> 6–12-month placements in a rural community Rural track that lasts 3 months Rural placement that involves placing students in a rural facility over a few weeks
Murray et al.	2012	Community based education	<ul style="list-style-type: none"> Rural medical attachment Rural clinical schools Region based medical school
Walters et al.	2012	Longitudinal integrated clerkship	<ul style="list-style-type: none"> Longitudinal integrated clinical placement for 1 year
Green-Thompson et al.	2012	Discipline based clerkship Urban medical school	<ul style="list-style-type: none"> Health practice days at a teaching hospital 6-week placements in urban and underserved primary healthcare setting
Walker et al.	2012	Rural clinical school	<ul style="list-style-type: none"> Training takes place in rural areas Recruiting is from rural areas Repeated rural exposure during training
Ní Chróinín et al.	2012	Community based education	<ul style="list-style-type: none"> Module focusing on understanding medicine as practiced and delivered in community.
Van Schalkwyk et al.	2012	Community based education	<ul style="list-style-type: none"> Rural clinical schools Regional hospital attachment (once a week for final-year students) Longitudinal integrated clerkship for a year in a district hospital
Diab and Flack	2013	Community based medical education	<ul style="list-style-type: none"> Home visits Community oriented primary care Community interventions
Daly et al.	2013	Longitudinal integrated clinical placement	<ul style="list-style-type: none"> 6–12-month placements in a rural and remote site General practice placements Hospital placements
Thistlethwaite et al.	2013	Longitudinal integrated clerkships/ longitudinal clerkships (non-integrated)	<ul style="list-style-type: none"> Community based attachments in a general practice (rural setting) Tertiary based longitudinal clerkships (urban setting)
Schauer et al.	2014	Community based education	<ul style="list-style-type: none"> 20-week rural attachment Regional specialist training General practice training Clinical school site attachment Rural attachment
Diab et al.	2014	Community based medical education	<ul style="list-style-type: none"> Rural attachment to district hospital
Bagala et al.	2014	Community based education	<ul style="list-style-type: none"> 6-week placement at a rural community health centre

Kibore et al.	2014	Hospital placement	<ul style="list-style-type: none"> • 7-week rotation at four public non-tertiary hospitals • Pilot decentralised training rotation
Van Schalkwyk et al.	2014	Discipline based attachment Longitudinal integrated model	<ul style="list-style-type: none"> • District and regional hospital placements for medical students (one a week) • 1-year rural placement for medical students

DISCUSSION

This scoping review offers vital strategies for improving medical education. It supports the utilization of DTPs as a feasible option for providing learning that is relevant to the context, and the impact of DTPs on academic, service and social learning is noted.

The review highlights four aspects of DTP strategies that are crucial for medical education transformation. These include rural workforce training, development of context specific competencies for raising social accountability, support for community based education and community engagement, and formation of partnerships amongst key role-players. Rural workforce training is more feasible through community based education, which, being rooted in context, is focused on addressing the realities of the population to be served. The utilization of the community as a learning platform offers students an opportunity to gain personal and professional attributes such as leadership skills, an understanding of their roles as healers, better insight into health care and enhanced cultural experience^{69,71,74}. When students are exposed to and engaged in leadership roles within a community, benefits accrue to both the parties involved⁶⁸. Communities in which students undertake learning contribute to the educational environment and facilitate the interaction of students with the community. This complements Talaat and Ladhani's contemporary definition of community-based education, which highlights that it 'is about the facilitation of learning in, with, for, and from the community, rendering relevant, meaningful and mutually agreed upon learning outcomes for health professionals and services to the populations in a community setting' (p.11)⁷⁶.

Decentralized placements create space for students to build self-confidence and develop competencies that assist in preparing them for practice. However, the responsibility to make the most of available opportunities requires that students have the skills to make this link. In line with Maley et al³⁹, this review submits that a framework for a successful community of rural educational practice is one that incorporates leadership skills development for the members, embraces a 'community of practice' for governance, adopts internal benchmarking strategies, supports critical reflection and encourages mentoring that is both vertical and horizontal. Critical to the success of this framework is the identification of the range of stakeholders who are likely to contribute to a sustained relationship and are capable of directly influencing community based education. Ultimately, these structures should engage fully with the health system⁴⁰.

The necessary adaptations needed for transformation of medical education include changing ways of selecting students^{16,24-29}, reviewing training locations^{16,77}, engaging communities^{37,44}, designing interventions for rural workforce¹⁶, dealing with context specific competencies³⁸, introducing rural scholarship programs and introducing system based education². Many strategies have been applied to implement these adaptations. Some Canadian and US medical schools, as part of their rural scholarship programs, have introduced 'community engaged scholarships' that assist in building participatory partnerships between communities and medical schools where communities are involved throughout the scholarship process⁴⁴.

The review revealed a wide range of DTP models for medical education transformation, which are described in the results. There is a wide variety of options for DTPs, and medical schools choose amongst these in relation to context, aims and resources. It is apparent however that many of the most effective DTP models are situated in rural contexts and that rural medical educators are responsible for a significant proportion of the available literature on DTPs. This may be both because the rural context provides a unique opportunity for hands-on clinical practice and engagement with communities, and because rural academics have often taken the lead in clinical educational innovation. These DTP models show the impact that decentralized training has on students through community health service provision; the extent of the impact of this training on the communities served is less documented, and would be a valuable avenue

for further research.

Although most studies in this review suggested a positive attitude towards decentralized training and rural practice amongst students, there were conflicting views about whether being of rural origin contributes to having such interest or not^{28,34,35,48}. There is a need for further research to explore other factors that might contribute to interest in rural health training and provision of health services in a rural context. There is also a need to explore whether there is any cross-over value between training in rural or other underserved areas; in other words, does decentralized training in any context lead to greater commitment of students and graduates to service in rural and underserved communities, or is the outcome specific to context and/or sociodemographics?

Conclusions

This scoping review shows that there is considerable literature on DTPs that provides justification for implementing such adaptations as part of transforming medical education. It is clear that DTPs have demonstrated the capacity for realizing academic, service and social learning agendas, depending on the strategies adopted. Various models of DTPs provide options for developing context specific competencies that respond to the health needs of the population. Partnerships between communities and academic institutions are essential for the success of a functional DTP model in the 21st century.

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