

Socially Responsible Students and Improved Health for Community-The Benefits of Service-Learning in Pakistan

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ABSTRACT

Background: In developing countries, marginalized groups of the society suffer due to inadequate health workforce, physical inaccessibility to health-care facilities and nonavailability of appropriate services. Service-learning, which combines community service with structured preparation and reflection exercises, may be used to reach such communities. Service learning electives aimed at teaching students their required coursework as well as the importance of commitment to the community, were developed. **Activities:** In four different projects, college students developed and delivered an educational campaign to community members. Knowledge of participants was tested pre- and post-intervention. For two projects, on-site hemoglobin (Hb) testing was provided through point of care testing before and at 8 weeks' post-intervention. Women and children were given immediate treatment. Focus group discussion was carried out for students and participants. **Outcomes:** Significant improvement was seen in the sense of social responsibility of students and knowledge of community members about iron deficiency anemia in all the four campaigns. In one of the studies, the initial point-of-care testing (POCT) screening for Hb found that 52.9% of women and 46.9% of children were anemic (Hb <120 g/L). The average Hb concentration increased post-intervention both in women and children. **Conclusion:** More SL campaigns utilizing the huge untapped human resource in the form of the college and high school students will provide assistance to those involved in public health. These campaigns provided an opportunity to undergraduate medical students to interact with community members leading to significant learning for both students and community participants. Hb tests were conducted in the community through POCT, which enabled immediate treatment of anemia and improvement in an important health indicator.

Keywords: Anemia, Pakistan, point-of-care testing, service learning

Background

Pakistan's health status is faced with many difficulties with abject performance on various health indicators.^[1] Pakistan faces the problems of an inadequate health workforce and funds.^[2] Majority of this sixth most populous country lives in rural areas.^[3,4] Resultantly there is physical inaccessibility to health-care facilities and unavailability of appropriate

services.^[5] The major victims of these inadequacies are marginalized groups of society such as women and children.^[6]

The main purpose of health care institutes is to impart knowledge and training to professionals who will be responsible to take care of the health of the people, thus linking health professions education to health outcomes of society at large.^[7] Mandated by WHO in 1995, many institutions have become socially accountable.^[8,9] There has been an increasing

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focus on the role of primary care for securing population health and delivering cost-effective healthcare.^[2,9,10] Pedagogical strategies like service-learning (SL), that provide opportunities for students to apply their learning to communities' real-life contexts and promote civic engagement are being employed. With its roots in the experiential learning theory of John Dewey, SL encourages critical thinking and problem-solving in the students.^[11,12]

In the Pakistani educational system, unfortunately, there is a dearth of contextual educational programs which provide relevance to learning in real-life situations.^[13] Most programs promote the transmission of textbook knowledge which students memorize to pass examinations.^[14] SL can be a highly effective strategy to increase awareness in Pakistani youth about their civic role in society and assist those involved in tackling public health issues helping to overcome human resource shortage.^[14]

Context

Pakistan faces a double burden of disease from both communicable and noncommunicable diseases, many of which are amenable to prevention.^[5] Iron deficiency leading to anemia is one such condition. In the Pakistani population, the prevalence of iron deficiency anemia (IDA) at 58.8% in children and 50% in women of reproductive age (WRA), is comparatively higher than the other countries.^[15] IDA is a major contributor to poor outcomes in maternal and perinatal health, as well as to the alarmingly high maternal mortality rate in Pakistan currently at 276/100,000 live births.^[16,17] Major risk factors for IDA are poverty, multi-parity, dietary deficiency, poor utilization, and noncompliance to treatment. Interestingly many of these causes of IDA are due to the lack of awareness and can be prevented.^[18] Similarly, though poverty is a major factor limiting access to the haem sources of iron, many non-haem sources of iron are readily available. Again, lack of awareness about the iron absorption facilitators and inhibitors of diet contributes to the burden of the IDA.^[19] Thus, increasing awareness of WRA and adolescents about the causes, effects, diet, and prevention of IDA through health education campaigns can be an effective strategy to combat this deficiency.

Pakistan is a mainly agriculture-based economy with the majority of its people living in far flung rural areas with poor access to even basic healthcare needs, including provision of laboratory tests and treatment.^[3,4] Recent advances in pathology testing has made patient testing on a small device portable at the time of consultation possible. Point-of-care testing (POCT) provides results immediately. This enables informed clinical decision making and facilitates improved health outcomes for patients in rural and remote areas where health care services may not be available.^[20-23]

A community-based health education project, using the SL approach, was developed as a curricular innovation project for the Foundation for Advancement of International Medical Education and Research (FAIMER) fellowship program in 2009–2010. This project has served as the pilot study for developing electives for students and its findings have already been published.^[13] Since then, four separate SL courses with over 100 students belonging to 15 different institutions in different regions of the country have been conducted so far and is an ongoing endeavor. The most innovative aspect of these projects is that students, with some structured and focused training and guidance, serve as public health workers, supplementing the existing public health care workforce.

Activities

Permission was taken from Ethical Review Boards of the partnering institutions for these electives. Although these were independent, standalone courses, the main focus in all of them was to develop social responsibility in students through interaction with community participants with the opportunity to apply their classroom knowledge and skills.

The details of the four projects, including names of participating educational institutions and Non-governmental Organizations (NGOs) along with cities and the number of participants, are given in Table 1.

For each of these electives, the SL component was built using the same strategy. Students participated in four team-based learning sessions of 6 hours each with the principal investigator. These sessions aimed to (i) provide students

Table 1: Names of participating educational institutions and nongovernmental organizations along with cities and number of participants

Year	Name of participating educational Institutions	City	NGO	Communities	Number of students	Number of community members
2010	Defense Degree Girls College	Lahore	Troops welfare society	Troops' families	13	65
2011	FMDC and H and six partner Secondary and higher educational institutes	Lahore	Noor foundation	Village Nain Sukh, Lahore, Village	40	253
2014	Al Nafees Medical College and Hospital	Islamabad	BMWT, Saya School,	Desra Haripur,	30 students	Desra Haripur: 121 women and 32 children
2015	Flinders University and IPOCT Australia		WHTF, GHETS USA	Islamabad	for 2014 and 40 for 2015	Islamabad: 50 students and 18 women

NGO=Non-Governmental Organizations, FMDC and H=Fatima Memorial Medical and Dental College, BMWT=Begum Mehmooda Welfare Trust, WHTF=Women Health Task force, GHETS=Global Health through Education and Training, IPOCT=International Point of Care Testing

with a comprehensive understanding of the prevalence, etiology, and management of IDA with particular emphasis on preventive strategies, (ii) enhance students' communication skills, (iii) teach students how to interact and work within a community setting, and (iv) increase awareness of their social responsibility. The students developed and pilot-tested a questionnaire in the local language for assessing knowledge of community participants about causes, signs and symptoms of IDA, sources of iron-rich diet, and facilitators of iron absorption. The students also developed a health education campaign for community participants using pictorial pamphlets, role play, and videos. In the community, the students conducted door-to-door surveys using the validated questionnaire, both before and after the educational campaign. The health education campaign was delivered during a day long activity and deworming of all participants with the provision of oral anti anaemics was carried out in all four campaigns. Students' perceptions of their civic role were collected before and after the project using a questionnaire. Time for informal as well as formally structured focus group discussion was built in the project to develop social responsibility in the students.

For community participants, the initial two courses mainly focussed on improving knowledge about a common preventable condition. For the latter two courses, conducted in 2014 and 2015, a collaboration between Flinders University Australia and International POCT (IPOCT) Australia and Al Nafees Medical College and Hospital in Pakistan was developed.

Students from Al Nafees Medical College were trained through a 3-h video-conference by staff from the Flinders University and IPOCT. This training included the teaching of principles and practice of POCT and performance of testing on the Hemo-Cue, interpretation of results according to the WHO classification criteria for anemia, on quality control test for hemoglobin (Hb), and maintenance for the Hemo Cue device.^[24,25] POCT was then used to detect and manage IDA by the students. In these projects, the participants with mild anemia (110–119 g/L) or moderate anemia (80 g/L–109 g/L), were provided treatment after diagnosis, unlike the earlier two projects where anti-anaemics were provided without the diagnosis. The results from this study have already been published.^[25]

The funding for these projects was provided by Global Health Through Education and Training through its Women Health Task Force.

Outcomes

Outcomes for students

SL proved to be an effective tool to involve students in a beneficial, result-oriented activity where they could apply their learning to real-life situations and helped develop

social responsibility in the students. The students reported improvement in their ability to communicate with community members. The findings from the initial campaign have been already published.^[13]

Outcomes for community members

The community women who participated in these campaigns reported significant improvement in the knowledge about IDA, especially its prevention. Results from the first campaign are already published.^[13] In the latter projects, community participants' Hb levels were measured at their doorstep through POCT. The results for the study conducted at Desra showed highly significant improvement with a mean rise of Hb of 50 g/L with overall anemia falling from a pre-intervention level of 52.9 g/L–42.9 g/L.^[24] The participants reported positive feelings about interacting with students.

Two patient case studies are shared here to illustrate the bond that developed between students and community members.

Case study 1

A 35-year-old woman in the 7th month of her third pregnancy had only one antenatal visit. She never got lab testing done as the nearest lab was 200 km away. She had taken no iron supplements nor had any tetanus toxoid injections. Living in a joint family system with about 20 occupants in the house, she was responsible for cooking and cleaning for the household.

Excited to hear about the campaign, she reached the students. She was breathless, lethargic, and fatigued. Hb was found to be 90 g/dl by POCT as detailed lab workup was not possible. She was started on medication. Students convinced the family members to be more supportive. On repeat testing, after 2 months, her Hb had increased to 114 g/L. She delivered a baby girl soon after and when interviewed again, was grateful to the students for saving her life.

Case study 2

A 13-year-old boy was mentally and physically challenged along with two other siblings, aged 10 and 8 years. Due to the burden of taking care of three special children, his mother struggled to cope and, at times, would have to restrain him by tying him up. His initial Hb was 50 g/L (indicating severe anemia). The family refused to take him to any medical facility due to the distance involved and the mountainous terrain in which they lived. The boy was commenced on iron syrup and folic acid. The family was counseled on the risks of anemia and given dietary and hygiene advice. Eight weeks after these interventions, the child's follow-up hemoglobin result by POCT was 100 g/L.

Outcomes for researcher

The community based educational projects using SL projects were able to generate evidence for the institutions, students,

faculty, and the community participants about the benefits of experiential learning. In addition, these projects provide evidence that if properly trained and monitored, medical students, as well as high school students, can be used effectively to help public health personnel.^[13]

Many issues were faced during the course of these projects with many valuable lessons learnt. In the first project, the heightened security concerns meant that communities outside the city could not be reached. This is a dilemma that countries like Pakistan often face with huge costs to her people. However, this had a silver lining for the project. An army troops welfare organization was approached, which also ran an adult literacy center for women who often brought their children with them. The teachers and their students became project participants. The teachers revised health education messages as part of their daily lessons causing a ripple effect with the message being repeated not only for participant women but for their children as well. This also led to the idea of recruiting and involving community women and children from within the community in the later projects, which proved invaluable for adherence to prevention strategies and the continuation of medicines.

The first project was planned with female medical students, but permission was refused at the last minute by the college administration due to internal politics and professional rivalry. This necessitated us to change strategy. Undergraduate students of disciplines other than medical and even premedical subjects were involved in the project and to our delight, we found that any college student, if properly trained can help public health experts in delivering health education campaigns.

After the initial project, male students were also taken in. The reasons were two-fold. Pakistan has a male-dominated society. Hindrances posed by a patriarchal society were needed to be overcome by first getting the buy-in of the males of the community. For this, communications lines with the village elders and prayer leaders were established by the male students which facilitated the projects' execution greatly. Secondly, though security in the country was improving the parents of our female students felt more comfortable in allowing their daughters to travel to villages if they were accompanied by their male class fellows. The involvement of students with varied educational backgrounds has helped create a linkage between pre-medical students and medical institutes.

The collaboration with Flinders University Australia led to a framework for combining technological advances with teaching and learning strategies and brought the treatment to the doorstep of a marginalized community resulting in improvement in the human indicator. Such partnerships are directly aligned to the goals of FAIMER, which aims to bring the

experiences from various settings, populations, and cultural contexts together.

Future Directions

SL campaigns provided an opportunity to undergraduate medical students to interact with community members leading to significant learning for both students and community participants.

Unfortunately, decision-makers in Pakistani medical education still do not understand the significance of utilizing strategies such as SL. Thus despite such significant results in very resource-restricted conditions, SL has not been adopted in the curriculum of primary care and public health. The SL initiative has evolved over time with many beneficial insights gained, helping in making successive projects better. Often, the health education campaigns fizzle out because messages cannot be reinforced frequently due to traveling expenses and other costs. Involving children to reinforce the health messages to their families and school teachers who made these messages part of their lesson plans provided us with an easy and simple solution to this problem. Using local community workers was crucial for the sustainability of the project. These women visited each participant at least three times, clocking a total of 459 visits in the difficult mountainous terrain. The community members, as well as our youth, is primed to benefit from these activities. These challenges have only increased our resolve to continue our projects, although on a small scale and find creative solutions which are most suitable to our context.

Conclusion

Activities such as SL give a sense of direction and purpose to the students by emphasizing their sense of social responsibility. Such activities are the need of the hour for the developing world who battle a lack of resources for health care and lack of direction of our youth. We have a huge untapped resource in the form of the college and high school students, who can be trained and used as change agents. Hb tests were conducted in the community through POCT, which enabled immediate treatment of anemia and improvement in an important health indicator. It is hoped that researchers working under similar conditions may benefit from our experiences.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts

will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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