

# Embedding relevance in pharmacy training: a case study from South Africa

MEA VAN HUYSSSTEEN\* & ANGENI BHEEKIE

*School of Pharmacy, University of the Western Cape, Cape Town, South Africa*

## Abstract

**Background:** South Africa's shortage of health professionals is most pronounced in rural and underserved communities, where the burden of disease is greatest. One key question is: how pharmacy training contributes to preparing students to address local health priorities in these communities?

**Aim:** Our aim was to implement a first year service-learning activity that addressed a local health service need.

**Method:** Case study methodology was used to describe and analyse implementation of the service activity.

**Results:** Implementation entailed students pre-packing sugar and salt into a sachet for use by clinics for the treatment of diarrhoea-induced dehydration. This activity proved to be beneficial for student learning and the health services. Despite the two-pronged significance, key questions emerged about how this activity aligned with current pharmacy practice.

**Conclusion:** Our preliminary attempt to embed relevance in pharmacy training uncovered apparent inconsistencies in expectations for the role of the pharmacist between training institutions, accreditation bodies and the public health system.

**Keywords:** *Health Services, Pharmacy Practice, Pharmacy Training, Public Health, Relevance, Service-Learning*

## Introduction

South Africa's shortage of health professionals is most pronounced in rural and underserved communities (Burch & Reid, 2011), where the disease burden is skewed towards poor socio-economic related communicable illnesses which primarily affect mothers and children (Statistics South Africa, 2013). The inequitable distribution of health resources further marginalises underserved communities as most health care professionals prefer to work in private sector, which serves only about 20 per cent of South Africa's population able to afford health insurance (Harrison, 2009). This raises concerns that current health education curricula may be inadequate in motivating and preparing students to work with underserved communities and in their ability to implement primary health care in an imperfect health system (Naledi *et al.*, 2011; Reid & Cakwe, 2011). Global health education reform is directed towards the local health care system where teaching and learning is focused on addressing community health priorities (Frenk *et al.*, 2010; Boelen *et al.*, 2012) underlining the value of relevance. Relevance in health education is measured by the degree to which an academic institution prioritises teaching of the most important and locally relevant health problems early in the curriculum and where interventions are directed to the most vulnerable people (Boelen *et al.*, 2012).

Current pharmacy education, with its traditional focus on laboratory-based techniques and pharmaceutical care (South African Pharmacy Council, 2010), is tailored

towards practices characteristic of private health care settings which employ almost two-thirds of South Africa's registered pharmacists (South African Pharmacy Council, 2011). In South Africa's fragmented health system, private-sector community pharmacies operate independently and vertically from mainstream public health services. This further disconnects pharmacists from population-based, primary care practices required for improvements in public sector health services. One key question is: how is pharmacy education re-aligning itself in motivating and preparing students to address local health priorities affecting the majority of the population in underserved areas? In line with the broader reform associated with health education, a needs-based skills training approach has been suggested to better prepare pharmacy graduates to work in their local context (Anderson & Futter, 2009).

This paper explores how implementation of a first year service-learning activity which aimed to address a local health service need clarified our interpretation of relevance as it pertains to South African pharmacy education. We describe the process of engagement and relevance of the service-learning activity as it related to the setting in which it was implemented. The results section focus on the technical and practical aspects of actual implementation. We conclude with a summary of the lessons learnt from the perspectives of the different stakeholders and discuss the pros and cons of this service activity for student learning, pharmacy training and the pharmacy profession.

\*Correspondence: Mea van Huyssteen, *School of Pharmacy, University of the Western Cape, Robert Sobukwe Road, Bellville, 7535, Cape Town, South Africa. Tel: +27 (0)21 9592864. Email: mvanhuyssteen@uwc.ac.za*

## Method

A case study approach was used to describe and explore the authors' experience of implementing a new service-learning activity for first year students, specifically designed to address a local health priority in underserved communities in Cape Town. This study focused on implementation of the service-learning activity linked to the first year PHC123 environmental and nutritional health module. Data was collected from meeting agendas and minutes and participant observation during interactions with health service partners, faculty staff and from student teaching and learning activities.

## Setting

The South African Pharmacy Council's latest call to all accredited pharmacy schools was to redesign curricula towards clinical competence starting in 2013. Competencies focus mainly on the provision of patient-centred pharmaceutical care (either general or specialised) where taking responsibility for a patient's health outcomes is a requisite. The School of Pharmacy at the University of the Western Cape (UWC) introduced in 2013 two pharmacy-focussed first year modules which incorporated service-learning components. With this step service-learning was institutionalised across all four years of study, which previously only spanned from second to fourth year (Bheekie *et al.*, 2011). Although service-learning activities are linked to a module code, it is not limited to a specific academic discipline and aims to cross disciplines, providing integrated learning to the student as it would have happened in the 'real world'. The School has a dedicated team of individuals who coordinate and run the service-learning programme which is currently linked to the discipline of pharmacology and clinical pharmacy.

The School's new service-learning programme activities have been aligned with South Africa's attempts to bridge service gaps, namely the human resource shortage which is being steered through primary health care re-engineering and piloting of the National Health Insurance (NHI) (Naledi *et al.*, 2011; Pillay & Barron, 2011). The implementation of the new programme was facilitated through the established partnership with both the Metropole District Health Services (Department of Health Western Cape Province) and the City of Cape Town municipal health services whose facilities have been collaborating partners in the School's previous service-learning programmes. Through established collaboration with City Health service managers, the unpredictable demand for and irregular supply of oral rehydration sachets led to frequent stock-outs at health care facilities (Service-learning planning meeting, City Health and UWC, 2013). According to the South African Primary Health Care Essential Medicines List (2008), "homemade sugar and salt solution may be used if oral rehydration formula is not available and is promoted for home use pending primary health care consultation". Even though, health service managers encourage patients to make this mixture at home, they preferred getting the sachets from the clinics. The pre-packing of the homemade sugar and

salt solution was thus identified and tabled as a possible School intervention to alleviate the stock-out situation at clinics.

Oral rehydration treatment is mainstay therapy for diarrhoeal disease (Department of Health: South Africa, 2008) and has been hailed as a medical milestone since 1840 for preventing millions of deaths globally among children with diarrhoea (Fontaine *et al.*, 2007). At the local primary health care level, carers for children with diarrhoea receive oral rehydration sachets with instructions on how the dry ingredients could be reconstituted in the home. In Cape Town, diarrhoea incidence increases during the summer months from November until May with peak incidence during February and March. Diarrhoeal disease is intimately linked to environmental and nutritional factors determined largely by socio-economic status and has a significant impact on maternal and child morbidity and mortality, one of the four major national health priorities in South Africa (Statistics South Africa, 2013). According to South Africa's under-five mortality report, diarrhoeal disease accounted for the highest (21%) single cause of death registered during 2007 (Nannan *et al.*, 2012). As such, diarrhoeal disease is especially prevalent in underserved communities living in informal settlements with poor water supply and sanitation infrastructures, which became an entry portal for our students to engage in a very important health priority.

## Results

Two academic staff members and the School's service-learning administrative assistant worked closely with two City Health sub-district managers and an environmental health officer to design the learning objectives and activities for a two hour site visit to an informal settlement. The purpose was to enable students to extract information from the environmental health officer and community leaders and/or members about the incidence of diarrhoeal disease and link that to environmental risks identified during the visit. An on campus service activity was introduced to serve as a pharmacotherapeutic link, requiring students to prepare an oral rehydration pre-pack, which would be subsequently distributed to clinics serving the community they had visited.

During the site visit, an environmental health officer accompanied the student groups assigned to the informal settlement briefing them about the community's living conditions, sanitation, water and electricity supply, pest and vector control and health risks. A group worksheet guided students' engagement with community leaders to profile the neighbourhood in terms of water and sanitation supply, waste disposal, population density, household and infrastructural barriers to health care, lifestyle risk patterns (smoking, alcohol, substance abuse), sources of pollution, common disease conditions, access to educational facilities etc. A week later, academic facilitators conducted a two hour guided group reflection session and assessed their individual written reflection report on the experience.

In preparation for the on-campus service activity, the authors negotiated for a time-slot in the academic timetable, laboratory space, equipment, facilitators and dry ingredients with the academic staff. In contrast to the common vision that facilitated discussions with health services personnel, the negotiations to secure the resources for the on-campus activity, although in house, proved to be laborious. Programme planners experienced indifference from faculty during negotiations and access to the laboratory was only granted during the one-hour lunch break, once a week for six weeks.

**Figure 1: Labels used during preparation of the oral rehydrate sachets**



**Oral Rehydration Mixture**  
For prevention of dehydration during diarrhoea



**School of PHARMACY**

Ingredients of packet:  
Table sugar 40ml  
Table salt 2.5ml

Patient name:.....  
Date:.....

**Instructions for use:**

  
**1. Wash your hands**

  
**2. Boil 2 litres of water and cool**

  
**3. Pour water in a clean 1 litre bottle**

  
**4. Add dry ingredients to clean water**

  
**5. Drink ½ cup after every watery stool**

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**Oral Rehydration Mixture**  
For prevention of dehydration during diarrhoea



**School of PHARMACY**

Storage instructions:  
Keep packet in a cool, dark and dry place  
Keep away from sunlight, moisture or heat

Warnings:  
Upon opening of packet, use entire contents  
Do not use if ingredients show signs of moisture, caking or discoloration.  
Do not re-use packet  
Do not keep mixture for more than 24 hours

Date packed: .....  
Packed at School of Pharmacy, UWC,  
Robert Sobukwe Road, Bellville  
Expiry date: .....  
Batch number:.....

Council, 2010) and other international guidelines on good compounding practice. Some of the main points included that compounding had to be done under the supervision of a pharmacist, according to a standard operating procedure authorised by a pharmacist, hygiene requirements and a batch numbering system that gives ready access to all information about the ingredients and procedures used in preparing the finished product. The four documents included a standard operating procedure, a batch number allocation document, a compounding record sheet and two labels required for the sachet, one of which contained the batch number allocated and (6 week) expiry date (Figure 1). A pharmaceuticals staff member checked and verified these documents. The standard operating procedure outlined the process for compounding the mixture in the laboratory adhering to prescribed hygiene measures. Two academic staff, registered pharmacists with the South African Pharmacy Council, performed quality checks on each pre-pack before signing it off. Each student was required to make one pre-pack mixture. If the pre-pack did not meet the quality specifications, the student was required to redo the exercise. A pharmacist employed at the City Health sub-district undertook a preliminary assessment to check process measures within the laboratory and the final product, and gave feedback to the sub-district managers and head pharmacist of City Health Department. One-hundred and forty pre-packs were distributed to five primary care clinics in the sub-district. Clinic managers phoned the School requesting more pre-packs. None of the School of Pharmacy staff showed an interest to expand this initiative.

## Discussion

By starting their learning in an underserved community, students experienced first-hand a realistic view of what determines health and disease and the subsequent need for a service-related pharmacotherapeutic intervention. The causes for needing medicine and adherence required for taking it cannot be detached from the social, economic, cultural and basic living conditions of South Africa's underserved population (Bradshaw, 2008). This new angle on pharmacotherapy widened students' perspective early in their training as compared to the old curriculum's undergraduate experiential learning which was later in the curriculum and confined to health-services and in-patient levels of care. This experience enabled students to critically examine the many causes of ill-health in underserved areas and the realisation that wide stakeholder and multi-faceted interventions were needed to relieve health inequities. Students questioned the oral rehydration pre-pack stock-outs occurring in the health system and speculated whether pharmacists should be held accountable for this problem, since this compounding intervention is unique to pharmacy as no other health professional discipline would legally be able to provide this service. On the side of the services, facility managers expressed their gratitude to the School for providing oral rehydration pre-packs to the clinics (Facility managers meeting, 28 February 2015). By

The oral rehydration pre-pack service activity introduced students to the principles of good pharmacy practice. In the School's pharmaceuticals laboratory student groups were assigned to two work benches for a one hour practical. Students were asked to donate the raw materials either salt or sugar, required for compounding of the dry mixture as resources at the School were limited. The School supplied the plastic packet with a zip lock and the printed labels. Four compounding documents were developed for the practical according to guidelines for compounding and pre-packing from "Good Pharmacy Practice in South Africa" (South African Pharmacy

addressing this health service need, the School's service learning students and City Health nurse practitioners' interests and goals converged to focus on their common 'consumer', the patient, which resulted in a common practice of primary health care (Duncan-Hewitt & Austin, 2006). A spin-off that emerged from this programme, saw these students in their second year of study taking up their 67 minutes to honour Mandela Day to volunteer their time to make more ORS pre-packs for the services.

The service-learning team experienced indifference from faculty during negotiations to secure resources for implementation and expansion of the on campus part of the service-learning activity. Similarly, reluctance has been noted by a recent report of the American Association of Colleges of Pharmacy describing the lack of progress in acceptance of community engaged scholarship in academic pharmacy (Bloodworth *et al.*, 2014). They considered that some of the reasons for this lack of interest might be due to a lack of recognition for this kind of work from peers and the large amount of time that needs to be invested to maintain partnerships (Bloodworth *et al.*, 2014). Another possible explanation is that disciplined-based demarcation within pharmacy schools entrenches the silo-effect; therefore faculty who do not engage directly with the health services might not be familiar with current priority needs of the local context.

Population-based care focussed in underserved communities is largely absent in pharmacy training in South Africa, which echoes the vague reference to the role of the pharmacist in public health. Although there have been some successful efforts from institutions in resource constrained settings to engage in public health programmes of pharmacy training in Ghana (Owusus-Daaku & Smith, 2007) and practice partnerships to intervene at policy level in Zimbabwe (Mdege *et al.*, 2012), these efforts continue to be at the mercy of the product-centred focus of the pharmacist. Even in developed countries like the United States, the value of student pharmacists actively engaging in public health-related clinical practice seem to be more written and talked about than actually implemented (Nemire *et al.*, 2009; Bloodworth *et al.*, 2014).

One limitation of the oral rehydration pre-pack intervention is that it is performed annually during one of the academic terms. However, an option is to include it as part of a pharmacy student's volunteer programme to maintain the service mandate. Another factor that may limit the reproducibility of our case study is that the intervention was based on an existing partnership, which has been reported to uncomplicate implementation (Bloodworth *et al.*, 2014).

In summary, this case study illustrated how addressing a health service need can be of benefit for student learning, the health services and patients in an underserved community. The primary gap in pharmacy education that this study highlights is not so much a question of what is relevant, but where these training interventions should be situated. Indeed, the concept of relevance includes both

health needs and vulnerable populations in its definition. Our attempt to embed relevance in pharmacy training raised questions to both training institutions, accreditation bodies and the health service as to their ability to converge towards priority health needs for pharmaceutical services.

### Acknowledgements

Dr. Halima Samsodien offered input and ideas about the laboratory standard operating procedure. Ms. Pumalisa Malimani conducted an independent quality check for the on campus service activity; and Mr. Roberto Isaacs, environmental health officer, Tygerberg sub-district, Cape Town City Health Department. Inecia Galant offered administrative and logistical assistance.

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