



Promoting the use of point of care testing in non-communicable disease screening among university students

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ABSTRACT

The challenge of premature non-communicable diseases (NCDs) deaths in developing countries has been attributed to late diagnosis due to limited access to preventive and primary care. Foremost in addressing this challenge is the need to develop healthcare models with low costs but guaranteeing access of healthcare. Such a need is pressing, as the invisible epidemic of NCDs continues to present a growing burden in developing countries. Point of care testing (POCT) has been identified as a powerful emerging healthcare approach which has the potential to improve healthcare access. The potential of increased NCD risk among university students calls for targeted interventions within universities. This commentary discusses the possibility of addressing the burden of NCDs by promoting the use of POCT in universities.

1. Introduction

There has been a global epidemiological transition in morbidity and mortality causes from infectious diseases to non-communicable diseases (NCDs) (Atiim & Elliott, 2015). Despite it being a global trend, the increasing trend in the prevalence of NCDs is more defined in developing countries (Habib & Saha, 2010). Non-communicable diseases, described as the “invisible epidemic” are the world’s leading cause of death, responsible for 71.0% of annual deaths globally (World Health Organization, 2018). Approximately 75.0% of the global NCD related deaths and 85.0% of premature NCD deaths are reported in developing countries, with a substantial death toll being expected in Africa by 2030 (World Health Organization, 2018). This is because developing countries have multiple health demands that limit the capacity of their contending health system from suppressing the substantial increase in the burden of NCDs (Bollyky et al., 2017).

In addition to the limited access to preventive and primary care in developing countries, most NCDs are asymptomatic, hence most people are more likely to receive late diagnoses for diabetes, hypertension and other NCDs (Bollyky et al., 2017). The impact of delayed diagnosis is a global health concern as it leads to severe target organ damage, poor therapeutic outcomes, and death (Ataklte et al., 2015). However, health systems in developing countries lack the capacity to effectively decrease the NCD burden and this needs to be strengthened urgently (Celermajer

et al., 2012).

There is a need to surpass emerging forces such as the current unsustainable healthcare models and the need for cost regulation while guaranteeing access of healthcare (James, 2016). Governments in many countries are advocating for cost effective access to healthcare through the provision of services like point of care testing (POCT) (St John, 2010).

2. Point of care testing

Point of care testing (POCT) is a diagnostic test that is done at or near the site of patient care and is an effective investment in fighting the growing epidemic of NCDs. Use of POCT for screening participants facilitates an earlier diagnosis, management and monitoring of diseases (Vashist, 2017). In addition to identifying risks and pursuing the individual to seek further investigation to establish a diagnosis, screening also creates awareness and provides statistics for epidemiological reports (Vashist, 2017). Increased awareness promotes primordial prevention and early diagnosis which is a crucial response to NCDs. Addressing the burden of NCDs, requires changing the goal from being “sick-care” to “health and wellness” oriented in order to establish preventative-care solutions (Bigna and Noubiap, 2019).

Use of POCT in screening individuals for NCDs is receiving more attention as studies have shown its effectiveness in promoting health

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awareness and identifying undiagnosed or uncontrolled NCD cases (Strong et al., 2005; Pangtey et al., 2019). For example, May Measurement Month (MMM), a world-wide screening program for hypertension that uses POCT, has shown substantial benefits by contributing to epidemiological statistics and increasing awareness regarding hypertension. In 2018, MMM identified more than 220 000 individuals with undiagnosed hypertension and 111 214 individuals with inadequately controlled hypertension through screening programs (European Society of Cardiology, 2019). A study conducted in Botswana reported a prevalence of obesity and overweight of 36.8% amongst university students following a POCT program (Tapera et al., 2017). Similarly, a study that examined three NCD POCT programs in Malawi showed that it is not only viable to introduce POCT into a public structure, but also contributes to increased uptake of NCD care which leads to good treatment outcomes (Kachimanga et al., 2017). Point of care testing is believed to have tremendous potential to overcome problems associated with late diagnosis of diseases such as malaria, hypertension, dyslipidaemia and diabetes (Engel et al., 2018).

There are limitations linked to the use of POCTs such as accuracy, cost effectiveness and inadequate quality assurance. Quality service is ensured in POCT through the use of user friendly devices; however, the effectiveness of testing depends on taking action based on the results obtained (Drain et al., 2014). An area that might improve the accuracy of POCTs is ensuring competence skills amongst operators and provision of training services (Drain et al., 2014; Kost et al., 2019). For POCT to be clinically effective, test results must be freely comparable with centralized laboratory results (Drain et al., 2014).

The South African Department of Health has suggested the implementation of health promotion and monitoring of NCDs at individual, community and population level. Initiatives such as use of community-based institutions as sites for health education and promotion need to be supported as they promote individual health seeking behavior and impact community norms and attitudes (Department of Health, 2017).

3. Universities as a possible sector to address the burden of NCDs

Contrary to common belief, NCDs also impact the health of children and young adults (less than 24 years old), as approximately 13.0% of NCD related deaths is reported among people below the age of 20 years (Call for Action on NCDs, Child Survival, and Child Health, 2014). To make matters worse, the occurrence of obesity in children has mirrored the adult trend resulting in a shorter life expectancy and an early onset of conditions such as diabetes and hypertension (Kinlen et al., 2018).

Studies have highlighted the presence of unhealthy behaviors and lifestyles among university students which are likely to contribute to increased development of NCDs (Desouky et al., 2014; Gresse et al., 2015). Most NCDs risk factors are likely to be aggravated during the university academic years as this phase introduces a different routine that leads to the adoption of a new lifestyle. This can often result in unhealthy habits that may endanger the health of the student (Lopes et al., 2017).

Studies on occurrence of NCDs in academic environments have yielded results that justify the need to address the burden of NCDs within academic environments. For instance, Tee et al., (2020) reported a 24.0% occurrence of potentially undiagnosed hypertension and 30.0% obesity cases amongst university staff members. Similarly, Suleiman et al., (2009) reported a 28.5% prevalence of obesity and Rao et al. (2017) recorded 2.4% diabetes cases and 17.6% prediabetes cases among university students. Above all, university students are great knowledge disseminators; therefore, educating them on the risk factors for NCDs and their prevention can contribute to the reduction of NCDs occurrence (Lopes et al., 2017).

Moreover, student-led health programs can be beneficial as they will promote screening amongst university students while enhancing students' clinical skills (Meah et al., 2009; Suen et al., 2020). Roy et al.

(2018) highlights the importance of clinical skills training to students during undergraduate studies, and links this to provision of better and faster medical care to patients. Putting such initiatives into practice has been linked to effective short and long term retention which positively impacts the student's confidence when performing clinical skills (Hoefer et al., 2017). Findings from a study by Wenrich et al. (2013) suggests that offering early patient experiences provides students with a broader set of concrete outcomes such as clinical-skills training, active learning and team assimilation. Similarly, a study by Mothiba et al., (2020) revealed that clinical learning has a diverse impact on nursing students as it aids in translating theory into practice and preparing them for the clinical area.

Following the prevailing burden of NCDs, Mokdad (2016) highlights the urgent need to incorporate training programs in all medical schools that focus on surveillance, prevention and control of NCDs. Similarly, Mendelsohn (2014) recommends the implementation of student-run clinics at medical schools throughout South Africa as it would simultaneously benefit students and the community by improving access to healthcare.

Literature demonstrates that student-led health programs improve cardiovascular markers amongst patients with cardiovascular diseases and their associated risk factors (Nuffer et al., 2012; Wahle et al., 2017). For example, Nuffer et al., (2012) and Martin et al., (2015) reported a significant decline in HbA1c amongst diabetic patients, following student-led health programs that provided pre-consultation tests and self-care management education. Similarly Wahle et al., (2017) documented the effectiveness of student-led programs in the management of hypertension through provision of patient centered disease management tips. Moreover, our recent study that looked at occurrence of cardiovascular related NCDs within an academic environment following a screening program by pharmacy students showed 13.7% potentially undiagnosed hypertension and 11.7% obesity cases amongst students.

Expanded health care benefits have also been documented, following improvements in blood pressure and cholesterol values among patients with diabetes who were enrolled in a diabetes student-led healthcare program (Nuffer et al., 2012). In addition to expanded healthcare options, is interprofessional student-led health programs which promote the establishment of working relations amongst healthcare providers (Janson et al., 2009). For instance, a study by Martin et al. (2015) that focused on a partnership between a pharmacy school, occupational therapy school and a tribal health center observed a decline in HbA1c level amongst patients with uncontrolled diabetes. Thus, promoting student led health programs that use POCT in universities has the potential to improve prevention and facilitate early diagnosis, allowing for early management of NCDs.

4. Conclusion

More attention is often paid to the prevention and treatment of NCDs while intervention opportunities such as uptake for screening and early interventions lag behind. The prevention of NCDs is better than cure as most NCDs are irreversible and have a slow manifestation of symptoms. The increased interest in POCT arises from its ability to identify a risk profile early therefore facilitating for better treatment plans and targeted health interventions. Given that many of the interventions addressing NCDs can be integrated into existing healthcare curriculums, running student led health programs that use POCT for screening in universities will have a dual benefit, i.e., improving clinical skills amongst healthcare students while promoting early diagnosis and improving NCD awareness within the university population. Finally, embracing low-cost diagnostics techniques such as POCT has the potential to decrease the burden of NCDs while conserving the few medical resources available in affected areas. A major advantage of focusing on settings like universities is the continuous as well as intensive contact with participants. Involving the next generation in recognizing and changing the conditions that promote occurrence of NCDs has the

potential to decrease the burden of NCDs.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Author contribution

NP assisted in the overall editing and review of the paper.

PTM conducted the study and provided the literature search and compiled the results and discussion to the paper.

NP,RK,AO,SDR provided guidance on the methodology, results and discussion.

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