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Editorial

Empowering medical students to address climate change in a potential high-impact country: the vital role of medical colleges

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Climate change is becoming a major global issue with serious implications for human growth, health, and survival. Nepal's contribution to global carbon dioxide emissions is low with an annual per-capita carbon emission of 0.5 metric tons in 2022 [1]. Despite low emissions, Nepal is highly vulnerable to the effects of climate change and increase in erosion of the soil, landslides, flash floods and droughts have been reported and the country risks losing 2.2% of annual gross domestic product (GDP) to climate change by the year 2050 [2]. Emissions in Nepal are caused mainly by agriculture and energy production and during the years from 2012 to 2019, there was a 26.9% increase in Nepal's emissions [3].

Climate change and health in Nepal: Like in other nations, climate change (CC) can have serious health impacts in Nepal. A systematic review mentions both mortality and morbidity have increased with the most vulnerable populations being women, children, and the elderly [4]. Among the different populations, impoverished women are at the greatest risk. Vector-borne diseases (VBDs), diarrhoeal diseases (which include cholera and viral diarrhoea among others), malnutrition, cardiorespiratory diseases, psychological stress, and health effects and injuries related to extreme weather are major health risks that are climate-sensitive [5]. The direct effects of CC mentioned are illness and death due to temperature extremes and injuries resulting from floods and storms, increased sensitivity to infections and VBDs while the indirect effects are increased incidence of water borne diseases, malnutrition, and air borne diseases i.e. pulmonary tuberculosis, pneumonia, viral influenza among others [6].

Healthcare professionals and climate change: Health care professionals (HCP) play an important role in addressing the health consequences of CC and promoting planetary health. They are mediators between science, policy, and practice and have an important role in educating the public [7]. 'One Health' is an integrated, unified approach aiming to sustainably balance and optimize the health of people, animals, and ecosystems [8] recognizing that these are closely linked and interdependent.

Educational sessions on climate change in developed nations: In developed nations courses on climate change have been implemented and their impact assessed. At Stanford University in the United States (US), an elective course on this topic was implemented [9]. Following this course students' beliefs about the need for CC education and related physician responsibilities showed a significant increase. Students had greater intentions to change personal behaviours and apply new knowledge in their future practice. A survey conducted in the US among medical students found most wanted CC to be included in the medical curriculum but only 13% of respondents felt that the subject was adequately addressed in their current curriculum [10]. A model for CC education during the preclinical years that can be replicated in different contexts has been proposed [11].

In Nepal, the Medical Education Commission, the Nepal Medical Council and the universities can play an important role in developing CC curricula. Enough autonomy should be provided to individual institutions to contextualize their curricula and teaching-learning.

Medical students and climate change: opportunities, scope and challenges: CC and one health provide opportunities for medical students to advocate for climate action and be prepared as future physicians to be involved in diagnosis, treatment, and prevention of the growing health effects of CC. Education about One Health can mould their developing professional identity, instill in them an ethical commitment to improving one health through research, advocacy, and community outreach. Medical students will become change agents capable of developing environmental solutions with public health and planetary health benefits [12]. Medical students through their organizations and international cooperation can advocate for meaningful climate action and social change. These topics should be integrated into medical education for three reasons. These are to prepare students for clinical practice in a world undergoing CC, to promote public health and eco-health literacy, and to deepen existing learning and strengthen their personal and professional attributes, professionalism and ethical commitments [13]. Medical students should be educated to provide sustainable healthcare and to protect health and cure illness with minimal environmental impact [14]. Among the challenges for medical colleges globally and in Nepal are reconciling the requirements of medical professionalism with the demands of creating a more equal, just, sustainable and socially inclusive society; addressing challenges due to and the health and other effects of environmental degradation, loss of biodiversity, and worsening planetary health; teaching social and environmental responsiveness and

ensuring tomorrow's doctors have the knowledge, skills and attitude to adapt to the health and other challenges of CC [15].

Though Nepal's contribution to carbon emissions is low, students can lobby for cleaner energy sources, reduced pollution, and health policies. Organizations of doctors and medical students can play an important role both nationally, regionally and globally.

Why one health education in Nepal? CC was mentioned as a challenge for medical students and medical educators in South Asia and the importance of educating students to tackle its impact on health was highlighted [16]. Nepal has three main geographical regions: the lowlands of the terai, the middle hills and the mountain region. The terai region of Nepal has 53.61% of the national population and a density of 460 people per square kilometre [17] and is the breadbasket of the country. The risk of heat related illness will increase with CC and the challenge of decreased agricultural production and droughts may also need to be tackled. VBDs and infections must also be addressed. With global warming, the melting of Himalayan glaciers will increase leading to floods and glacial lake outburst floods initially [18] and eventually to drying up of glaciers and major river systems. With increasing migration, the population density in the terai will increase and with deforestation and CC the risk of infections, epidemics and pandemics can increase.

The middle hills have seen an outmigration of people both to the terai region and to other countries. The young population has migrated, and the elderly and women and children are left in the hills and the lives of the elderly has been made more difficult [19]. Medical students should be well versed in the diseases of the elderly, of women and of children. With global warming, VBDs are spreading to mountainous regions and considering the increasing movement of people, weak health systems and a lack of vector control interventions there can be epidemics of these diseases [20].

In the mountains of Nepal, trekking and mountaineering are important sources of revenue and doctors must treat altitude and other illnesses, problems caused by extreme cold exposure and work in austere conditions with minimal equipment and facilities [21]. CC can worsen the risk of landslides, reduce soil fertility and increase the risk of glacial lake outburst floods.

Medical students and doctors are trusted community voices to advocate for combating CC and can influence law and policy makers. They should develop advocacy and networking skills to promote one health and planetary health during their education and training [22]. Medical students and doctors from Nepal migrate to developed nations [23]. Medical students who are trained in advocacy can influence policy makers in their new countries of residence to reduce their countries carbon footprint and combat climate change.

Thus, educating medical students on CC, one health and planetary health is vital for the mountainous country of Nepal and for the planet!

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