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Knowledge, Attitude and Practice of Herat University Medical Students Towards Climate Change

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ABSTRACT

Climate change, a major global problem, threatens the health of humans, animals and environment. It is caused by the accumulation of greenhouse gases that results from human activities on earth surface. The aim of this study was to assess the level of knowledge, attitude and practice (KAP) of medical students of Herat University towards climate change. This cross-sectional university-based KAP survey was conducted between October and December, 2023, among students of the Faculty of Medicine at Herat University, Herat, Afghanistan. A total of 190 students with a median age of 22.0 years, selected via a simple random sampling technique were included in the study. Data on sociodemographic characteristics and KAP of participants were collected using a paper-based 69-item questionnaire, including three questions for sociodemographic characteristics, six questions for evaluating knowledge, 42 questions for attitude, and 18 questions for practice. Statistical analyses were performed in IBM SPSS Statistics (version 27.0). Of the 190 participants, 185 (97.4%) heard about climate change, 126 (66.3%) noticed unpredictable rainfalls, and 62 (32.6%) experienced hotter days and nights. Of all participants, 134 (70.5%) stated that climate change was very important to them, while 53 (27.9%) felt sad, and 42 (22.1%) felt that they could do something to tackle climate change. Three-fourth (74.7%) of students thought that industry- and vehicle-related air pollution was the cause of climate change, while 131 (68.9%) and 130 (68.4%) thought that deforestation and greenhouse gases were the most considerable causes, respectively. To help tackle climate change, 173 (91.1%) participants turned off lights when they were not in use, 153 (80.5%) used energy-saving equipment, and 133 (70.0%) used energy-saving lights. Results obtained in this study, along with the findings of similar studies, highlight the need to raise public KAP regarding climate change.

Keywords: knowledge, attitude, practice, climate change, medical students, Herat

INTRODUCTION

Climate change is a major global problem that threatens the health of all humans (IPCC, 2022; Watts et al., 2020). Changes in climate characteristics such as humidity, rainfall, temperature, radiation and wind patterns continue for several decades, it is referred to as climate change (IPCC, 2014). The accumulation of greenhouse gases that results from human activities in the earth's atmosphere is the cause of climate change in the 21st century (Meinshausen et al., 2020). In the last 100 years, the average temperature of the earth surface has increased from 0.3 to about 0.6 degrees Celsius; and according to the amount of greenhouse gas emissions, it can increase from about 1.4 to 5.8 degrees Celsius in the next 100 years (IPCC, 2014). New findings show that the speed of climate change is more than expected and it may cross the threshold of 1.5 degrees of global warming by 2040 or earlier with its catastrophic effects (Freitas, 2017; Ripple et al., 2022; Romanello et al., 2022).

Climate change can considerably impact on the health of people worldwide (Parise, 2018; Parker et al., 2019; Romanello et al., 2022; Watts et al., 2020); through temperature increase, changes in rainfall pattern, food insecurity, and water shortage. It increases the occurrence of vector-borne diseases; heat stroke, infectious diseases, allergies and malnutrition (Parise, 2018; Parker et al., 2019; Romanello et al., 2022). International medical societies have paid special attention to the awareness of health risks caused by climate change (Mezger et al., 2021; Nicolet et al., 2022; Storz, 2018; Wang et al., 2020). Although there are serious concerns about the effects of climate change on health, the insufficient amount of research related to these changes in 46 percent of countries is the reason for not creating or implementing appropriate strategies (WHO, 2021).

Having a clear understanding of people's knowledge, attitude and practice (KAP) about climate change is very important in formulating control strategies. A recent study conducted in 2022, among medical students in

India revealed a poor, attitude and practice of participants about global warming and climate change (Reddy et al., 2022). Although, many research groups evaluated the level of KAP towards climate change among public (Anåker et al., 2021; Carter et al., 2021; Casson et al., 2023; Parasa et al., 2020; Reddy et al., 2022; van Baal et al., 2023; Yu et al., 2020), no such study has been conducted in Afghanistan, especially in Herat province. This study aims to evaluate the KAP of the medical students of Herat University regarding climate change to provide clear and specific recommendations to deal with this important problem, based on the scientific evidence.

MATERIALS AND METHODS

Design and setting

This cross-sectional university-based KAP survey was conducted between October and December, 2023, among students of the Faculty of Medicine at Herat University, Herat, Afghanistan.

Study population and sampling strategies

A total of 547 students were enrolled in the Faculty of Medicine at Herat University, in the summer semester of 2023. To calculate the sample size for this study, raosoft sample size calculator was employed (http://www.raosoft.com/samplesize.html). Using a confidence interval of 95%, a confidence level of 90%, and a response distribution of 50%, the minimum recommended size was calculated as 182. To compensate for incorrect or inappropriate responses, we added 5% (9) more cases to above sample size. Therefore, a total of 191 samples was selected from the target population by a simple random sampling.

Data collection

Data on sociodemographic characteristics and KAP of participants were collected using a 69-item, paper-based, researcher-made questionnaire, including three questions for sociodemographic characteristics, six questions for evaluating knowledge, 42 questions for attitude, and 18 questions for practice.

Statistical analysis

Data was recorded in IBM SPSS Statistics (version 27). Categorical data was shown with numbers and percentages. Continuous data was reported with median and interquartile range (IQR).

Ethical consideration

The protocol of this study was assessed and approved by the Human Ethics Committee of Herat University (#8-231024), prior to the collection of the data. The privacy of participants and the confidentiality of data were maintained all through the study.

RESULTS

A total of 190 participants with a median (IQR) age of 22.0 (20 – 23.5) years were included in the study.

Knowledge of participants about climate change

From a list of eleven environmental issues, participants were more concerned about air pollution (121; 63.7%), poor waste disposal (86; 45.3%) and climate change (72; 37.9%). Of the 190 participants, 185 (97.4%) heard about climate change, 126 (66.3%) noticed unpredictable rainfalls, and 62 (32.6%) experienced hotter days and nights. The most frequent source of information about climate change was internet (136; 71.6%), international TVs (106; 55.8%), and local TVs (78; 41.1%). For more information about knowledge of participants towards climate change, please see **Appendix 1**.

Attitudes of participants towards climate change

Of the 190 participants, most (92; 48.4%) trusted scientists, 49 (25.8%) trusted internet and 48 (25.3%) trusted media information about climate change; 134 (70.5%) stated that climate change was very important to them, while 53 (27.9%) felt sad, and 42 (22.1%) felt that they could do something to tackle climate change. Of all participants, 142 (74.7%) thought that industry- and vehicle-related air pollution was the cause of climate change, while 131 (68.9%) and 130 (68.4%) thought that deforestation and greenhouse gases were the most considerable causes, respectively. Over four-fifth (84.2% and 81.6%) of participants believed that drought and extinction of animals were caused by the climate change, respectively. About three-quarters of participants (73.7%) stated that government should raise public awareness, while 110 (57.9%) believed that government should conduct reforestation to decrease the effect of climate change on the environment. Of 190 participants in the study, 180 (94.7%) stated that humans are responsible to do something to tackle climate change, and 73 (38.4%) believed it is the responsibility of international organizations. According to participants, the most two common illnesses that results from climate change were infectious diseases (88; 46.3%) and cardiovascular and respiratory diseases (66; 34.7%). For more information about participants' attitude towards climate change, please see.

Participants practice towards climate change

To help tackle the climate change, 173 (91.1%) participants turned off lights when they were not in use, of which only 12.4% did so to protect environment. Furthermore, 153 (80.5%) used energy-saving equipment, and 133 (70.0%) used energy-saving lights, of which only 15.8% and 10.0% did so to protect environment, respectively.

DISCUSSION

The level of knowledge, attitude and practice towards climate change among medical students of Herat University was low. Although almost all (97.4%) participants heard about climate change, 48.4% trusted scientists; and still 73.7% believed that the government should raise public awareness. On the other hand, 70.5% participants stated that climate change was important to them, but only 22.1% felt that they could tackle its effect. Moreover, 94.7% participants believed that humans were responsible to do something to confront climate change, but still 38.4% stated it was the responsibility of international organizations. On the practice towards climate change, more people used environment-friendly lights and appliances not to protect environment, but to save money.

Limitations

This cross-sectional KAP survey was conducted only among medical students of Herat University. Results obtained in this study cannot be generalized to general public.

CONCLUSION

Results obtained from this study highlights the need to raise KAP of general public and warn people about the dread effects of climate change on the health of humans, animals and environment, a concept which is called "One Health".

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REFERENCES

Anåker, A., Spante, M., & Elf, M. (2021). Nurse Education Today Nursing students ' perception of climate change and sustainability actions – A mismatched discourse : A qualitative , descriptive exploratory study. *Nurse Education Today*, *105*(May), 105028. https://doi.org/10.1016/j.nedt.2021.105028

Carter, J. M., Koman, P. D., Cameron, L., Ferguson, A., Jacuzzo, P., & Duvall, J. (2021). Assessing perceptions and priorities for health impacts of climate change within local Michigan health departments. *Journal of Environmental Studies and Sciences*, *11*(4), 595–609. https://doi.org/10.1007/s13412-021-00679-0

Casson, N., Cameron, L., Mauro, I., Friesen-Hughes, K., & Rocque, R. (2023). Perceptions of the health impacts of climate change among Canadians. *BMC Public Health*, *23*(1), 1–13. https://doi.org/10.1186/s12889-023-15105-z

Freitas, C. De. (2017). Public and patient participation in health policy, care and research. *Porto Biomedical Journal*, *2*(2), 31–32. https://doi.org/10.1016/j.pbj.2017.01.001

IPCC. (2014). Part A: Global and Sectoral Aspects. (Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change). *Climate Change 2014: Impacts, Adaptation, and Vulnerability.*, 1132. https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-FrontMatterA_FINAL.pdf

IPCC. (2022). Fact Sheets | Climate Change 2022: Impacts, Adaptation and Vulnerability. In *Fact Sheet*. https://www.ipcc.ch/report/ar6/wg2/about/factsheets/%0Ahttps://www.ipcc.ch/report/ar6/wg2/about/factsheets

Meinshausen, M., Nicholls, Z. R. J., Lewis, J., Gidden, M. J., Vogel, E., Freund, M., Beyerle, U., Gessner, C., Nauels, A., Bauer, N., Canadell, J. G., Daniel, J. S., John, A., Krummel, P. B., Luderer, G., Meinshausen, N., Montzka, S. A., Rayner, P. J., Reimann, S., … Wang, R. H. J. (2020). The shared socio-economic pathway (SSP) greenhouse gas concentrations and their extensions to 2500. *Geoscientific Model Development*, *13*(8), 3571–3605. https://doi.org/10.5194/gmd-13-3571-2020

Mezger, N. C. S., Thöne, M., Wellstein, I., Schneider, F., Litke, N., Führer, A. G., Clar, C., & Kantelhardt, E. J. (2021). Climate protection in practices – current status, motivation and challenges in outpatient care. *Zeitschrift Fur Evidenz, Fortbildung Und Qualitat Im Gesundheitswesen*, *166*, 44–54. https://doi.org/10.1016/j.zefq.2021.08.009

Nicolet, J., Mueller, Y., Paruta, P., Boucher, J., & Senn, N. (2022). What is the carbon footprint of primary care practices ? A retrospective life-cycle analysis in Switzerland. *Environmental Health*, 1–10. https://doi.org/10.1186/s12940-021-00814-y

Parasa, S., Desai, M., Thoguluva Chandrasekar, V., Patel, H. K., Kennedy, K. F., Roesch, T., Spadaccini, M., Colombo, M., Gabbiadini, R., Artifon, E. L. A., Repici, A., & Sharma, P. (2020). Prevalence of Gastrointestinal Symptoms and Fecal Viral Shedding in Patients With Coronavirus Disease 2019: A Systematic Review and Meta-analysis. *JAMA Network Open*, *3*(6), e2011335. https://doi.org/10.1001/jamanetworkopen.2020.11335

Parise, I. (2018). *The science of anthropogenic GCC* (Vol. 47, Issue 7).

Parker, C. L., Wellbery, C. E., & Mueller, M. (2019). The changing climate: Managing health impacts. *American Family Physician*, *100*(10), 618–626.

Reddy, G.P., Rajamouli, J., Delzith, A.K., Jothula, K.Y., Amaravadi, S., Boda, S. (2022). Knowledge, perceptions and practices of medical students towards climate change and global warming: A cross sectional study. *Journal of Family Medicine and Primary Care.* DOI:10.4103/jfmpc.jfmpc_1782_21

Ripple, W. J., Wolf, C., Gregg, J. W., Levin, K., Rockström, J., Newsome, T. M., Betts, M. G., Huq, S., Law, B. E., Kemp, L., Kalmus, P., & Lenton, T. M. (2022). World Scientists' Warning of a Climate Emergency 2022. *BioScience*, *72*(12), 1149–1155. https://doi.org/10.1093/biosci/biac083

Romanello, M., Di Napoli, C., Drummond, P., Green, C., Kennard, H., Lampard, P., Scamman, D., Arnell, N., Ayeb-Karlsson, S., Ford, L. B., Belesova, K., Bowen, K., Cai, W., Callaghan, M., Campbell-Lendrum, D., Chambers, J., van Daalen, K. R., Dalin, C., Dasandi, N., … Costello, A. (2022). The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels. In *The Lancet* (Vol. 400, Issue 10363, pp. 1619–1654). https://doi.org/10.1016/S0140-6736(22)01540-9

Storz, M. A. (2018). A Practical Guide for Physicians and Health Care Workers to Reduce Their Carbon Footprint in Daily Clinical Work. *The Permanente Journal*, *22*, 1–3. https://doi.org/10.7812/TPP/17-145

van Baal, K., Stiel, S., & Schulte, P. (2023). Public Perceptions of Climate Change and Health—A Cross-Sectional Survey Study. *International Journal of Environmental Research and Public Health*, *20*(2). https://doi.org/10.3390/ijerph20021464

Wang, J., Karliner, J., Slotterback, S., Boyd, R., Ashby, B., Steele, K., & Wang, J. (2020). contribution and opportunities for action 17 . E . Workshop : Returning disease prevention and health promotion back to the table : from the 1980ies to the 2050ies. *The-European-Journal-of-Public-Health*, *311*, 2020.

Watts, N., Amann, M., Arnell, N., Ayeb-karlsson, S., Beagley, J., Belesova, K., Boykoff, M., Byass, P., Cai, W., Campbell-lendrum, D., Capstick, S., Chambers, J., Coleman, S., Dalin, C., Daly, M., Dasandi, N., Dasgupta, S., Davies, M., Napoli, C. Di, … Costello, A. (2020). Review The 2020 report of The Lancet Countdown on health and climate change : responding to converging crises. *Published Online December 2, 2020 Https://Doi.Org/10.1016/ S0140-6736(20)32290-X*, *6736*(20). https://doi.org/10.1016/S0140-6736(20)32290-X