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PRACTICE POINTER

How to communicate about climate change with patients

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What you need to know

- As trusted advisors, health professionals can listen to their patients, raise awareness of climate change as a health issue, provide personalised guidance, and share solutions to protect the health of patients
- Multiple opportunities exist to efficiently integrate climate related counselling into clinical practice, including healthcare screening, history taking, management of long term conditions, and discharge and aftercare planning
- There is limited evidence of effectiveness of climate related counselling of patients, but broader literature on clinician-patient communication shows that counselling can enhance health outcomes

Climate change is arguably the most significant global health threat of the 21st century.[1] Despite the increasingly visible impacts of climate change on our lives and health, conversations about climate change seem to have been shut out of the consultation. Where time and resources are under pressure, there may be little room for wider health promotion and conversations about underlying contributors to ill health. For many visits, though, the effects of climate change or fossil fuel pollution are intrinsic to the medical problems of the patient and the reasons for their visit. As trusted advisors, health professionals are in a position to help their patients understand the impact of climate change on their health, and what they can do about it at an individual and societal level. Here we present an overview of the ways that climate change may be incorporated into consultations, the evidence base for the impact this may have, and the barriers to change.

Communicating with patients about climate change

We believe that patient counselling around climate sensitive health hazards is an ethical duty of healthcare professionals.[2] This duty is multifactorial and builds on bioethical principles of nonmaleficence and social justice: climate change associated exposures pose harm to an individual's health, climate change worsens existing health inequities, and climate change poses a serious threat to societies and humanity. The overarching principles of health promotion and preventive care emphasise that healthcare professionals should factor in community health while treating patients in order to identify health patterns with potential implications for others.[2]

While health professionals may increasingly understand the health harms posed by climate change for their patients, little guidance exists on how and when to incorporate this topic into their conversations with patients. Despite the urgency imposed by this growing crisis, routine discussion of climate change and associated hazards has not yet become standard practice.

Building on previous work,[3] we suggest five touchpoints where climate relevant counselling can be performed throughout clinical encounters. These are healthcare screening, history taking, management of long term conditions, discharge planning, and encouraging civic engagement through the use of prompts.

Touchpoint 1: Healthcare screening

Healthcare screening represents an important early point of contact in the clinical encounter where climate sensitive hazards such as air pollution can be identified. Incorporating environmental determinants of health (for example, access to air conditioning or cooling centres, and housing concerns such as mould in the home) into existing screening (such as social determinates of health screening) or interpreting screening results with consideration of environmental pressures (such as depression screening and behavioural screening) can identify unmet needs that would otherwise go undiscovered in the medical encounter and shift the responsibility for identifying at-risk patients from the individual clinician to the system. Screening for environmental determinants of health in this way represents an established paradigm of care delivery that overlaps with screening for the social determinants of health.[4] Screening tools have the advantage of circumventing the concern over lack of knowledge, the most commonly cited source of hesitation for healthcare providers to discuss climate during a clinical encounter.[5] Moreover, as screening tools can be administered asynchronously, they also aid with concerns over lack of time.

Implementing universal screening for environmental determinants of health will require meticulous assessment of cost effectiveness, time investment, and provision of tailored follow-up addressing identified needs. The process requires resources for comprehensive evaluation and intervention that are currently lacking. In certain clinical settings, targeted screening may be a more practical option for identifying patients at risk and allocating resources accordingly.

Other existing screeners, like the Patient Health Questionnaire (PHQ-9 or PHQ-2), common tools for assessing the frequency of depression and anhedonia, can be interpreted with an awareness of climate change.[6] For example, in the wake of a local climate related disaster, physicians can inquire about and consider mental health impacts. Populations at

particular risk include those experiencing disruption to daily life or loss of loved ones from a disaster, women in the perinatal and postpartum periods, and those who already have a history of mental health concerns.[3] A global survey of 10 000 children and young adults (ages 16-25 years) indicated that 84% of respondents were moderately, very, or extremely worried about climate change, and 45% of respondents said their worries about climate change affected their daily lives and functioning. As a result, directed screening for climate anxiety may become adopted as routine practice.[6] In the absence of widely adopted tools, table 1 suggests talking points and next steps for clinicians caring for patients experiencing climate or eco-anxiety, including referral to a specialist with climate-health expertise or engagement with a local climate or environmental group as a coping strategy.[7]

Table 1 | Examples of climate and health conversation topics in a variety of scenarios

Chief reason for visit	Climate health connection	Counselling opportunity	Resources
Prenatal care	Heat, pollution, and wildfire smoke are linked to adverse birth outcomes such as low birth weight and premature birth	Discuss steps to stay safe during periods of extreme heat, poor air quality days, and during wildfire events	WHO[25] Roos et al[26]
Childhood preventive healthcare visit	Children have greater vulnerability to air pollution, smoke, and heat. This vulnerability varies by age and stems from potential for increased exposure, poorer ability to adapt, and physiological sensitivities	Counsel on not leaving children alone in vehicles, ensure there are heat and air quality safety plans at school, particularly for outdoor play and sports. Discuss opportunities to ensure clean indoor air for children	WHO[27] WHO[28]
Respiratory complaint or chest pain	Heat drives worsening air quality; wildfires and air pollution are linked to exacerbations of asthma, COPD, and respiratory issues such as pneumonia and bronchitis, and cardiovascular events	Discuss tailoring timing and intensity of outdoor activity to the local air quality and use of N95 facemasks if going outside on poor air quality days for patients with chronic medical conditions	WHO[29] PAHO[30] WHO[31]
Anxiety	A growing reason for anxiety, particularly among youth, is distress related to climate change	Affirm patient's concern for climate change, discuss opportunities to channel anxiety into action, consider the benefits of meditation or time in nature for mental health, and/or refer patient to a climate-aware therapist or similarly designated mental health professional where available or for cognitive behavioural therapy for further support	WHO[32] PAHO[33]

Touchpoint 2: History taking

Taking a good environmental history helps to identify health conditions associated with environmental exposures.[8] However, this is not widely or consistently undertaken even by family physicians and general practitioners.[9] Consistent integration of environmental history into clinical encounters has the potential to improve identification of climate sensitive harm to patients, although improved training is needed in this area.[10] Because time limitation is most often cited as the reason clinicians do not conduct an environmental history, educational efforts should aim to demonstrate how environmental and exposure history taking can be integrated into the clinical encounter in a relatively non-interruptive manner, centred on the patient's chief complaint or primary concern.[9] For example, during an asthma flare, a physician could screen for proximity to busy roadways, access to air filtration at home, or the presence of mould in the home.

Touchpoint 3: Management of long term conditions

Helping patients make connections between how climate change interacts with their existing health conditions, what they can expect as a result of this interaction, and how they can make changes in their own lives to reduce their risk of harm is an essential component of patient education during any patient-clinician interaction. For example, when a patient with asthma is having a flare up, the consultation may include a discussion of whether wildfire smoke, particulate pollution, heat waves, or ground level ozone may be underlying triggers, and the strategies for managing them.[11]

Touchpoint 4: Discharge planning

Discharge and aftercare planning offer another opportunity for counselling patients around climate sensitive health conditions and empowering patients to consider climate change and pollution in their disease management plans. Providing patient guidance around the air quality index (AQI) monitoring and interpretation may help to prevent exacerbations of underlying pulmonary disease during poor air quality days driven by fossil fuel pollution or wildfires and educating patients about the impact of climate change on aeroallergens may empower them to proactively manage their seasonal allergies and asthma. Discussing prevention of heat illness and prompt recognition and treatment of signs and symptoms of heat related illness in visits related to sports (such as physical checks before sports participation) or occupational safety (such as for outdoor workers) may empower patients to protect themselves and their teammates or coworkers from heat stroke and heat exhaustion. Ensuring patients with complex health conditions have a disaster plan in place may help to ensure their safety in the event of a local disaster. Climate sensitive, hazard specific instructions on discharge could be a valuable addition to after-visit summaries provided at the time of discharge, particularly for patients with asthma or other complex health conditions.[12] Discharge instructions could come in the form of emergency planning documents that patients could review with their healthcare provider (fig 1).

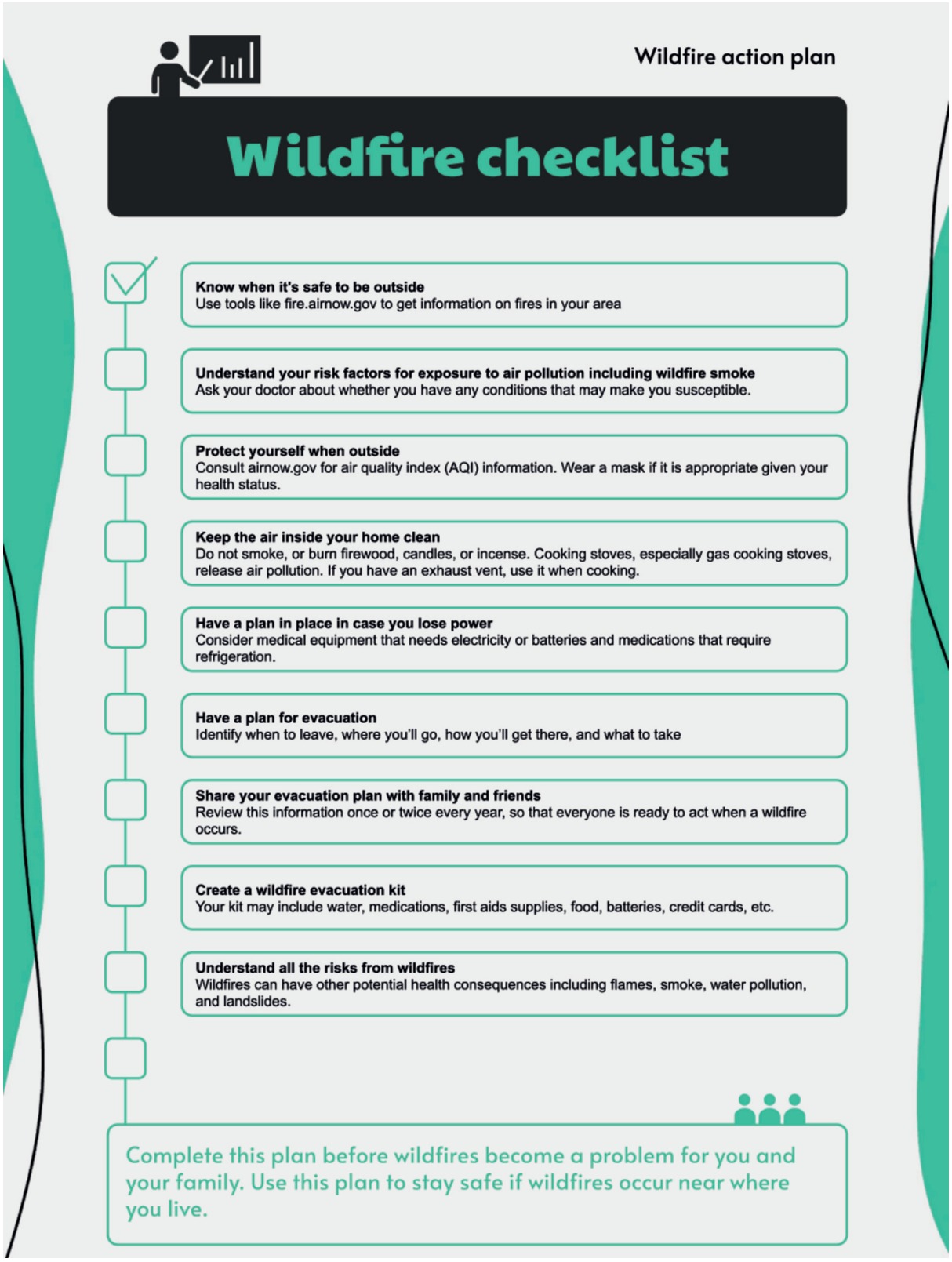

Fig 1 | Example of checklist document that can be included in discharge instructions for patients

Touchpoint 5: Using prompts to encourage civic engagement

Ultimately, the best way to protect people's health from climate change and air pollution is through public policies that address the underlying root causes.[13] Clinicians may wish to educate interested patients about what they and other community members can do collectively to influence local, provincial, and national government policies in ways that will protect human health, air quality, and the

climate. One approach to providing this education is found in the ClimateRx programme, which provides clinicians with a badge that displays a QR code that will take interested patients to detailed information online about how they can get involved in advocating for healthy climate policies (https://www.climaterx.org/). A similar model uses a badge with a QR code to encourage and enable patients to register to vote if they are not already registered, given that voting provides an important opportunity to patients to elect candidates who will enact healthy climate policies (https://vot-er.org/).

Overcoming barriers to talking about climate change

A 2020 multinational survey of 4654 paediatricians, general adult medicine physicians, and nurses from over a dozen countries found that, although most participants felt a strong sense of responsibility to educate the public (which includes patients) about the health effects of climate change, many felt barriers to doing so, including: a perceived lack of time and/or knowledge, a belief that it would not make a difference, perceived lack of peer support, and belief that it is too controversial.[14]

Lack of time

Time constraints are likely a common barrier in educating patients about climate change. To address this, discussions about climate change can be integrated into routine healthcare encounters across settings, including acute visits, management of chronic health conditions, and preventive and wellness services. Clinicians can use their knowledge of local climate related health impacts and an individual patient's presenting complaint, health status, chronic health conditions, and social and environmental determinants of health to tailor and link guidance directly to the health of each patient. For example, for patients presenting with respiratory complaints during days of poor air quality (table 1), asking questions about exposure and suggesting protective steps, such as using a portable air cleaning device, can potentially improve patients' health outcomes.[15] Social and environmental health histories and screening instruments can be used to identify patients' specific risk factors that may be exacerbated by climate change to further guide discussions.[3] In person counselling can be complemented with electronic or printed patient education materials that provide further information and links to online resources or local services where patients can learn more about and access relevant resources for topics discussed during the visit.

Lack of knowledge

To address lack of knowledge, electronic and printed resources for patients can help provide basic information to patients even when clinicians feel that they lack sufficient expertise to discuss climate change. However, such patient education materials are no substitute for continuing education and training on climate change and health. Many health professionals are seeking this information,[14] and several organisations are working to fill this need, ranging from short form webinars to more in depth certificate programmes (box 1).

Box 1: Organisations offering information, continuing medical education, and training on climate change and health

- Columbia Mailman School of Public Health. Global Consortium on Climate and Health Education. https://www.publichealth.columbia.edu/research/centers/global-consortium-climate-health-education
- Global Climate and Health Alliance. https://climateandhealthalliance.org
- Health Care Without Harm. https://noharm.org/
- International Federation of Medical Student Associations. https://ifmsa.org/events-trainings/
- Medical Society Consortium on Climate and Health. https://medsocietiesforclimatehealth.org
- ECHO Institute. Climate Change and Human Health ECHO Program. https://hsc.unm.edu/echo/partner-portal/programs/global/climate-change/
- World Health Organization. Climate Change and Health Program. https://www.who.int/health-topics/climate-change

What difference will it make?

Another obstacle to discussing climate change is the belief that doing so will not make a difference. A recent scoping review found only two small studies that have evaluated the impact of climate-related patient counselling,[16] but both suggest it can produce behaviour changes resulting in positive patient outcomes that also help to reduce climate change.[17 18] One survey, of 138 patients and care givers from a US clinic who received a standardised message about climate change and health during a well child encounter, found that 89% said they had learnt about the health harms of climate change during their visit, and large majorities said they were somewhat or very likely to support clean energy initiatives (91%) or take personal actions to save energy (89%) as a result.[17] The other survey, of 449 German patients, found that those who had received climate-specific medical advice from their physician showed higher knowledge about health risks related to climate change compared with those who had not received climate related counselling (P=0.002).[18] These results are consistent with findings from general patient counselling, which show that clinician-patient communication can enhance patient knowledge and health outcomes.[19]

Lack of support

Other possible barriers are a perceived lack of peer support for talking about climate change, that doing so would be professionally risky, or that the topic is too controversial. Such perceptions may reflect the tendency to underestimate the extent to which others are concerned about climate change or support action to address it.[20] Yet, most health professionals support communicating with the public about climate change and health,[3] most people are concerned about climate change and are willing to change how they live and work to reduce its effects,[21] and leading health agencies such as the World Health Organization are prioritising this issue. Linking climate health impacts directly to patient health and mental health concerns, where appropriate, can help resolve this tension.

As much as possible, discussions with patients about climate change should be tailored to the individual patient's sociocultural context. For patients who are sceptical about climate change, clinicians should remain patient centred, empathetic, and non-confrontational, listening first to the patient's concerns. When necessary to preserve the patient-doctor or patient-provider relationship, counselling around the individual's risk from climate related hazards may be provided without mentioning climate change itself. The communication techniques recommended for engaging on climate change with patients mirror approaches already widely embraced, including patient centred communication, active listening, shared decision making, motivational interviewing, and strength based approaches.[16 22]

The evidence base for the effective use of climate counselling in the clinical encounter remains thin.[16 23] However, with the recognition of the urgency of climate change as a health hazard, the demand

for the development of meaningful, evidence based, and clinically oriented interventions grows.[10] Research is needed on optimal climate related education strategies, how to build clinicians' competency to implement those strategies, and how to alleviate the previously identified barriers to clinician engagement within the clinical encounter.[14 24]

Case examples

- *Case 1*—A 2 year old with one prior episode of wheezing with respiratory illness presents with difficulty breathing. The father says the patient is breathing faster, seems tired, and has not been interested in eating or drinking. The patient has no nasal congestion or fever but does have a mild cough. Air quality in the area over the past few weeks has been poor due to wildfire smoke with levels of fine particulate matter (PM2.5) >100 µg/m^3 in a region that has not previously encountered smoke. On examination, the child seems tired but alert, breath sounds are diminished throughout with wheezes audible, and accessory muscle use is noted.
  - Pressured by the acuity of this case, and with a full panel of patients booked for the day, your barrier to adding a climate lens to conversations with the patient's family may include a lack of time. However, using touchpoint 1 (healthcare screening) may help reduce the burden on your time while also helping to identify patients at risk for climate related morbidity.
- *Case 2*—A 76 year old man with a history of hypertension, hyperlipidaemia, and coronary artery disease presents with difficulty breathing and intermittent chest pain for the past two days. The patient had been walking outside with his family when he became dizzy and began clutching his chest, prompting his daughter to bring him to the emergency department. The episode took place on a hot and humid day when regional air quality was listed as poor. The patient's exam is notable for hypoxia on room air, hypertension, decreased breath sounds in the lung bases and crackles bilaterally, and lower extremity pitting oedema.
  - As a clinician managing a high acuity patient with signs of congestive heart failure with multiple risk factors to consider, your barrier to introducing climate as a case modifier in this encounter may include the barrier, "What difference will it make?" However, using touchpoint 2 (history taking), you have already connected the dots between the patient's presentation and poor air quality. Now, in applying touchpoints 3 (patient education) and 4 (discharge planning), you can give the patient guidance on using a respirator during days with poor air quality and offer specific emergency planning documents in his discharge instructions.
- *Case 3*—An 11 year old with no significant medical history comes in for a wellness visit and immunisations. The child has checked off that he is frequently experiencing several symptoms of depression on his preclinic paperwork and mental health screen. His mother reports that his school performance is starting to decline. When asked about his feelings, he says that he is worried about the future and that he can't focus on studying because of his worries. With additional questioning, he reveals that he has seen media depicting wildfires and catastrophic flooding linked to climate change. He is angry that adults don't seem to care or to be doing anything. He has written letters to industry leaders, but he doesn't think his letters are getting to the right people. He feels powerless.
  - As a clinician with little experience with climate related anxiety, you may not have prior models for how to address the helplessness felt by your patient in this encounter, and you may be wary due to a perceived lack of support from your peers. However, you have already used touchpoint 2 (history taking) to identify the problem, and you can employ touchpoint 5 (encourage civic engagement) by referring your patient to resources where he can learn more and take action.

How this article was made

This article is based on the best available evidence from a combination of published research and expert commentaries. We searched for relevant research articles and commentaries up through 10 May 2023 using PubMed, Medline, and Google Scholar with the search terms ("climate change" OR "global warming" OR "planetary health") AND ("physician patient relations" OR "counseling" OR "health communication" OR "patient education" OR "patient counseling" OR "doctor-patient communication"). We supplemented these searches with our own personal archives of references.

How patients were involved in the creation of this article

We sought the perspective of a patient who experienced health consequences from wildfire exposure. This provided helpful insights, but the patient did not suggest any changes to the article.

In response to feedback from an external patient reviewer, we added content about how clinicians can educate their patients about actions they can take to reduce the threat of climate change, specifically by participating in the democratic process and advocating for public policies that address climate change and health.

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Patient consent: Not required (cases in this article are fictitious).

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1 Romanello M, Di Napoli C, Drummond P, etal. The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels. *Lancet* 2022;400:-54. doi: 10.1016/S0140-6736(22)01540-9 pmid: 36306815

2 AMA Council on Ethical and Judicial Affairs. AMA Code of Medical Ethics' opinions on informing patients. *AMA J Ethics* 2012;14:-6doi: 10.1001/virtualmentor.2012.14.7.coet1-1207.

3 Philipsborn RP, Cowenhoven J, Bole A, Balk SJ, Bernstein A. A pediatrician's guide to climate change-informed primary care. *Curr Probl Pediatr Adolesc Health Care* 2021;51:101027. doi: 10.1016/j.cppeds.2021.101027 pmid: 34244061

4 Sokol R, Austin A, Chandler C, etal. Screening children for social determinants of health: a systematic review. *Pediatrics* 2019;144:e20191622. doi: 10.1542/peds.2019-1622 pmid: 31548335

5 Crowley RAHealth and Public Policy Committee of the American College of Physicians. Climate change and health: a position paper of the American College of Physicians. *Ann Intern Med* 2016;164:-10. doi: 10.7326/M15-2766 pmid: 27089232

6 Hickman C, Marks E, Pihkala P, etal. Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *Lancet Planet Health* 2021;5:-73. doi: 10.1016/S2542-5196(21)00278-3 pmid: 34895496

7 Smith R, Pencheon D, Mortimer F. What to say to a 7 year old terrified by climate change? *BMJ Opinion* 2020. https://blogs.bmj.com/bmj/2020/08/07/what-to-say-to-a-7-year-old-terrified-by-climate-change/

8 Williams SG, Schmidt DK, Redd SC, Storms WNational Asthma Education and Prevention Program. Key clinical activities for quality asthma care. Recommendations of the National Asthma Education and Prevention Program. *MMWR Recomm Rep* 2003;52(RR-6):-8.pmid: 12696781

9 Köksal Yasin Y, Türkmen MO, Acar AB, Kiraz EDE. Taking environmental history while providing primary health care: Awareness, attitude and behavior; a cross-sectional study. *Estüdam Halk Sağlığı Derg.* 2022;7:-90doi: 10.35232/estudamhsd.1030507.

10 André H, Gonzalez Holguera J, Depoux A, etal. Talking about climate change and environmental degradation with patients in primary care: a cross-sectional survey on knowledge, potential domains of action and points of view of general practitioners. *Int J Environ Res Public Health* 2022;19:. doi: 10.3390/ijerph19084901 pmid: 35457768

11 Unicef. The coldest year of the rest of their lives: Protecting children from the escalating impacts of heatwaves. 2022. https://www.unicef.org/reports/coldest-year-rest-of-their-lives-children-heatwaves

12 McDermott-Levy R, Hallen Moore C. Discharge planning in the era of climate change. *J Radiol Nurs* 2021;40:-5doi: 10.1016/j.jradnu.2020.12.010.

13 Howard C, MacNeill AJ, Hughes F, etal. Learning to treat the climate emergency together: social tipping interventions by the health community. *Lancet Planet Health* 2023;7:-64. doi: 10.1016/S2542-5196(23)00022-0 pmid: 36889866

14 Kotcher J, Maibach E, Miller J, etal. Views of health professionals on climate change and health: a multinational survey study. *Lancet Planet Health* 2021;5:-23. doi: 10.1016/S2542-5196(21)00053-X pmid: 33838130

15 Rajagopalan S, Brauer M, Bhatnagar A, etalAmerican Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Clinical Cardiology; Council on Cardiovascular and Stroke Nursing; and Stroke Council. Personal-level protective actions against particulate matter air pollution exposure: a scientific statement from the American Heart Association. *Circulation* 2020;142:-31. doi: 10.1161/CIR.0000000000000931 pmid: 33150789

16 Quitmann C, Griesel S, Nayna Schwerdtle P, Danquah I, Herrmann A. Climate-sensitive health counselling: a scoping review and conceptual framework. *Lancet Planet Health* 2023;7:-10. doi: 10.1016/S2542-5196(23)00107-9 pmid: 37438001

17 Lewandowski AA, Sheffield PE, Ahdoot S, Maibach EW. Patients value climate change counseling provided by their pediatrician: The experience in one Wisconsin pediatric clinic. *J Clim Change Health* 2021;4:100053doi: 10.1016/j.joclim.2021.100053.

18 Reismann L, Weber A, Leitzmann M, Jochem C. Climate-specific health literacy and medical advice: The potential for health co-benefits and climate change mitigation. An exploratory study. *J Clim Change Health* 2021;4:100072doi: 10.1016/j.joclim.2021.100072.

19 Kelley JM, Kraft-Todd G, Schapira L, Kossowsky J, Riess H. The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PLoS One* 2014;9:e94207. doi: 10.1371/journal.pone.0094207 pmid: 24718585

20 Sparkman G, Geiger N, Weber EU. Americans experience a false social reality by underestimating popular climate policy support by nearly half. *Nat Commun* 2022;13:. doi: 10.1038/s41467-022-32412-y pmid: 35999211

21 Bell J, Poushter J, Fagan M, Huang C. In response to climate change, citizens in advanced economies are willing to alter how they live and work. Pew Research Center. 2021 https://www.pewresearch.org/global/2021/09/14/in-response-to-climate-change-citizens-in-advanced-economies-are-willing-to-alter-how-they-live-and-work/

22 Nazari P, Jones M. What can clinicians say to patients who ask about climate change? *BMJ Opinion* 2021. https://blogs.bmj.com/bmj/2021/01/22/what-can-clinicians-say-to-patients-who-ask-about-climate-change/

23 Dupraz J, Burnand B. Role of health professionals regarding the impact of climate change on health-an exploratory review. *Int J Environ Res Public Health* 2021;18:. doi: 10.3390/ijerph18063222 pmid: 33804669

24 den Boer ACL, Teherani A, de Hoop E. Discussing climate change and other forms of global environmental change during the clinical encounter: Exploring US physicians' perspectives. *J Clim Change Health* 2021;4:100058doi: 10.1016/j.joclim.2021.100058.

25 World Health Organization. *Gender, climate change and health*. 2014. https://iris.who.int/bitstream/handle/10665/144781/9789241508186_eng.pdf.

26 Roos N, Kovats S, Hajat S, etal. Maternal and newborn health risks of climate change: A call for awareness and global action. *Acta Obstet Gynecol Scand* 2021;100:-70.

27 World Health Organization. *Global climate change and child health: training for health care providers, 2n ed*. 2019. https://www.who.int/publications/i/item/WHO-CED-PHE-EPE-19.12.08.

28 World Health Organization. Children's environmental health. 2024. https://www.who.int/health-topics/children-environmental-health#tab=tab_1.

29 World Health Organization. Heat and health. 2024. https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health.

30 Pan American Health Organization. Extreme meteorological events. Heatwaves. https://www.paho.org/en/campaigns/extreme-meteorological-events.

31 World Health Organization. Air pollution. 2024. https://www.who.int/health-topics/air-pollution#tab=tab_1.

32 World Health Organization. Mental health and climate change: policy brief. 2022. https://www.who.int/publications/i/item/9789240045125.

33 Pan American Health Organization. Why mental health is a priority for action on climate change. 2022. https://www.paho.org/en/news/3-6-2022-why-mental-health-priority-action-climate-change.