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KNOWLEDGE, ATTITUDE AND PRACTICE: A SYSTEMATIC REVIEW OF PUBLIC AWARENESS, MEDIA AND ENVIRONMENTAL ACTION IN PAKISTAN

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KEYWORDS	ABSTRACT
climate change, environmental awareness, media, social media, public perception, awareness-action gap, Pakistan, systematic literature review	This systematic review examines what people in Pakistan know and believe about climate change, where they learn about it, how the media cover it, and whether awareness leads to action. Searches were made in Google Scholar, Google Search and AI search tools in October 2026. Of 20 papers read in full, 18 studies published between 2021 and 2026 were included, and the findings were combined in a narrative synthesis. Belief that the climate is changing was widespread, but detailed knowledge was thinner, especially among people with little schooling. Rural households relied mainly on community gatherings (72.2%), while university samples relied mainly on social media (40.1%). Newspaper coverage was event-driven, and audiences judged it to be insufficient. Action was the weakest link: in one university survey, 86.4% saw climate change as a serious threat, but only 31.9% to 45.3% reported specific practices. Campaigns should therefore go beyond information by building concern, giving clear actions, reaching offline groups and addressing trust.
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Introduction

Pakistan is one of the most climate- and environment-vulnerable countries in the world. Khan and Hanif (2024) put it in eighth place in the ranking of vulnerable countries. One example is water.

Between 1962 and 2017, per capita water availability in the country fell from 5,229 cubic meters to 1,187 cubic meters (Magbool, 2022). Ashraf (2018) argues that sometime around 2005 the country crossed a threshold of water scarcity. He found that 69% of drinking water samples from 24 cities in 2015–16 were unsafe. Such problems cannot be tackled through policy alone. They also need to be understood by students, officials, farmers and households.

That is why increasing public awareness has become a key focus in environmental policy and research. Often people are thought to need awareness of a problem before they can act on it. But the evidence is not so clear. In one survey cited by Khan and Hanif (2024) and Khalid (2024), only 27% of people in Pakistan could explain what climate change is, compared with 36% across the region. Many villagers, though, would recognize, for example, that winters are less snowy, summers hotter and floods more frequent. They may not know the term "climate change," but they know it in their own experience (Bacha et al., 2021).

In part, it is up to the media to bridge this gap. Through its newspapers, TV, radio and social media, it could explain the causes of change, report official warnings and point people to actions they could take. That depends on which medium a person uses, how much attention is given to the issue and how it is presented. In the past the question might have been how much coverage climate change got in the media. Now, with most young people using social media, the question could also be what they do with the information they see. There is limited work on these questions. Household surveys in mountain valleys (Bacha et al., 2021; Hanif & Arshed, 2023), online surveys of students (Farhan et al., 2025; Said et al., 2026), content analyses of newspapers (Barri & Shahzad, 2022; Qaisar et al., 2021) and discourse analyses of slogans and hashtags (Alvi et al., 2025) all touch on parts of this question. Taken individually, these studies use different outcomes, samples and methods, and they are rarely read together. If someone wanted to find out what the public knew, whether the media were influencing it and whether it led to action, they would need to draw on many of these studies.

In this article, we bring together 18 studies (2021–2026) on this question. Our review rests on a simple sequence: people pick up information, become aware of it, may come to believe it and feel concern about it, and sometimes act on it. Four research questions guide the review:

RQ1: What do people in Pakistan know and believe about climate change and related environmental problems?

- **RQ2:** Where do they get information, and how do the media cover these issues?
- **RQ3:** How do awareness and concern relate to action?
- **RQ4:** Which factors and gaps shape these relationships?

In section 2, we explain how we identified and selected the studies. In section 3, we summarize the studies. In section 4, we answer the questions above. In section 5, we consider the picture across all the studies. In section 6, we consider limitations of the evidence and possibilities for future work. Finally, in section 7, we conclude.

Method

In this article, we undertook a narrative synthesis of the studies. In essence, we followed the steps of PRISMA (identification, screening, eligibility and inclusion) in a simple form.

It would have been useful to do a meta-analysis of the studies, but they looked at different outcomes in different ways.

Search sources and strategy

In October 2026, we looked for studies in three ways. First, we used Google Scholar to pick up journal articles. Second, we used Google to find journal home pages, open repositories and institutional webpages. This also helped us find full texts of articles that Google Scholar listed without a link. Third, we used AI search tools (Claude, ChatGPT and Google's AI search) to suggest further papers and to check whether a paper we already knew had been published in a journal.

We used the AI tools only to find leads. Each title they suggested was checked against the journal's website or the full text. None of the statements in this review came from an AI summary. All are drawn from the full text of the studies.

To find relevant studies, we combined search terms in different ways, for example, climate change awareness Pakistan, public perception of climate change in Pakistan, environmental awareness and media, climate change and social media, climate literacy, newspaper coverage of climate change, environmental journalism, smog awareness, behavior and awareness, and water scarcity in Pakistan. Where appropriate, we also checked the references of papers we found.

Eligibility criteria

- In all, we identified 20 documents in full text. To be included, a document had to:
- be about Pakistan, its media or its public;
- report public behavior, perception, knowledge, concern or awareness of environmental or climate change issues, or discuss media coverage of them;
- be an empirical paper or a review of evidence from elsewhere;
- be published in a journal between 2021 and 2026; and
- be in English and available in full text.

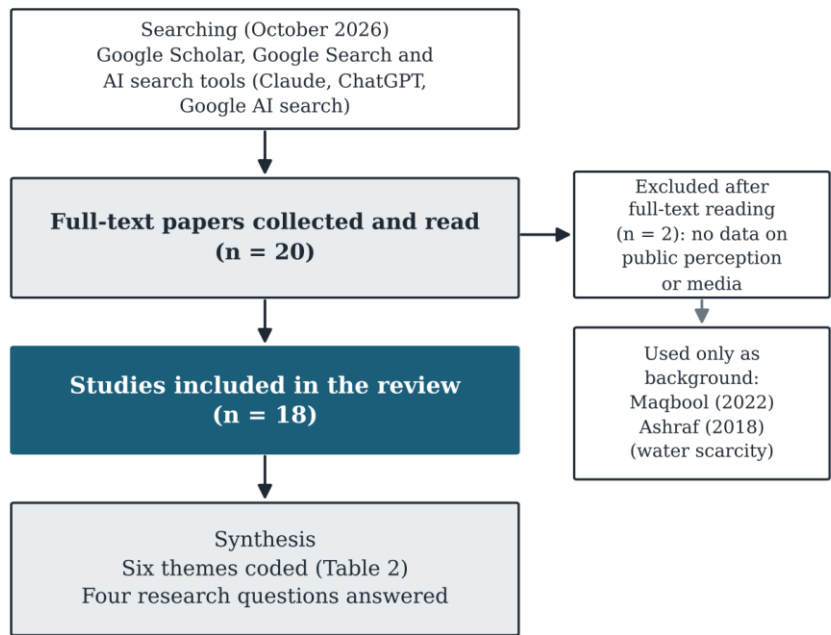
Documents that addressed an environmental topic but provided no evidence on behavior, media or perception were excluded from the synthesis.

Selection

Figure 1 shows how we narrowed down the documents. After reading the 20 full texts, we excluded two. Both were policy papers on water scarcity (Ashraf, 2018; Maqbool, 2022). They set out the scale of the water problem well, but contained no evidence of behavior, media or perception.

We use these two documents only as background in the Introduction. The remaining 18 studies were all included in the synthesis.

Figure 1. Flow of documents through the search, screening and inclusion stages



Data extraction and synthesis

For each of the studies we noted the authors, year, journal, design, sample, setting, underlying theory (where present) and key findings relating to knowledge, belief, information, media content, action and differences between groups. Wherever possible, we checked this against the full text. Each study was linked to one or more of six themes (see Table 2), and for each theme we compared the findings across the studies.

We did not give the studies a formal quality score. Instead, we noted features that might affect confidence in their findings. For example, some used convenience samples, others included only students and others relied on self-reported behavior. Wherever possible, we report statistics as they appear in the paper. Sometimes a paper included statistics in the text that did not agree with those in a table. In that case, we used only the consistent statistics or treated them cautiously. For example, in one paper, the number of households was 400 in the text but 413 in the table (Ahmad et al., 2024). We therefore describe the sample as more than 400 households.

Transparency

We did not register the review protocol in advance. One of us screened and coded the studies, so there was no independent second check. We included only published work, so we did not need ethical approval.

Overview of the Included Studies

Table 1 sets out the 18 studies. Two were published in 2021, one in 2022, two in 2023, six in 2024, four in 2025 and three in 2026. That means 13 of the 18 were published in 2024 or later.

Of the 18 studies, ten were quantitative surveys, three used mixed methods, two were content analyses of newspapers, two were qualitative (one using interviews and documents and the other using discourse analysis) and one reviewed secondary sources.

Taken together, the 13 surveys (quantitative and mixed methods) included around 4,950 people. Sample sizes ranged from 200 to 892. Five of them used probability sampling (Ahmad et al., 2024; Bacha et al., 2021; Hanif & Arshed, 2023; Iqbal et al., 2023; Said et al., 2026). Eight used purposive, convenience or self-selected sampling.

Eight of the 13 surveys relied mainly on students or other educated people (Farhan et al., 2025; Farooq et al., 2025; Iqbal et al., 2023; Khan et al., 2025; Said et al., 2026; Alam et al., 2026; Batool et al., 2026; Zaheer & Bano, 2024).

Three included ordinary people in rural areas: Bacha et al. (2021) in Swat, Hanif and Arshed (2023) in Gilgit-Baltistan and Ahmad et al. (2024) in the Upper Indus Basin. Others covered adults in four cities (Safdar & Butt, 2024) and online users (Afsheen & Naz, 2024).

The studies covered different areas. Four were set in Punjab and two in Khyber Pakhtunkhwa. One each was set in the Upper Indus Basin and in Gilgit-Baltistan. Another covered Khyber Pakhtunkhwa, Punjab and Gilgit-Baltistan together. None was set in Balochistan, and only one included people from Sindh (Safdar & Butt, 2024, in Karachi).

Five of the studies were national in scope but drew on newspapers across the country or on documents.

Eight studies named a model or theory. These included framing and agenda-setting (Khan & Hanif, 2024; Safdar & Butt, 2024), the Theory of Planned Behavior (Farhan et al., 2025; Farooq et al., 2025), the Elaboration Likelihood Model (Farooq et al., 2025), knowledge-attitude-practice (Said et al., 2026), Construal Level Theory (Khan et al., 2025), social responsibility (Qaisar et al., 2021) and critical discourse analysis combined with ecolinguistics (Alvi et al., 2025).

The evidence map in Table 2 shows which themes the studies cover most and least. Awareness and knowledge (11 studies) and information sources and media use (11 studies) are covered best. Action and behavior (9 studies) and belief and concern (8 studies) follow. Group differences (7 studies) and media coverage and content (6 studies) are covered least. Only two studies analyzed press content (Barri & Shahzad, 2022; Qaisar et al., 2021).

Table 1. Characteristics of the 18 included studies (oldest first)

No.	Study	Design and sample	Setting	Main focus and key finding
1	Bacha et al. (2021)	Survey; 396 household heads (cluster/stratified)	Swat, Khyber Pakhtunkhwa	Community gatherings main source (72.2%); media limited; perceived warming and floods
2	Qaisar et al. (2021)	Content analysis; 4 dailies, Mar–Aug 2015	National (Urdu and English press)	Climate change most covered issue (656 news items); Urdu dailies carried more
3	Barri & Shahzad (2022)	Content analysis; editorials of Dawn and Jang, 2018–2019	National (English and Urdu press)	Climate change top topic in Dawn; Jang gave water 70% of 2018 environmental editorials
4	Hanif & Arshed (2023)	Survey; 892 adults (stratified random)	Gilgit-Baltistan (4 districts)	At least 81.7% perceive climate change; phone warnings, education raise odds
5	Iqbal et al. (2023)	Survey; 250 students (random)	Faisalabad, Punjab	All use social media; 86.4% agree it raises awareness; 33.2% commented
6	Afsheen & Naz (2024)	Mixed; 500 online users plus 5 interviews	Online, national	Awareness 3.92 vs action 3.56; entertainment preferred; fact-checking gaps
7	Ahmad et al. (2024)	Mixed; 400+ households, focus groups	Upper Indus Basin	Warming perceived by 93.6–97%; perceptions match climate records
8	Khalid (2024)	Review of secondary data	National	Education, income, gender, age, region and social media shape awareness
9	Khan & Hanif (2024)	Qualitative; interviews and documents	National	Episodic framing, gatekeepers, advertiser influence, journalist–scientist gap
10	Safdar & Butt (2024)	Survey; 231 adults (convenience)	Rawalpindi, Islamabad, Karachi, Lahore	72.3% prefer electronic media; 61.9% say coverage space insufficient
11	Zaheer & Bano (2024)	Online survey; 200 analyzed (convenience)	National, educated respondents	Perceived reality, consequences and distance relate to values and risk perception
12	Alvi et al. (2025)	Qualitative discourse analysis; 5 slogans, about 15 posts	National (government and youth online)	Slogans top-down; hashtags participatory; both stress individual action

13	Farhan et al. (2025)	Survey; (convenience); TPB	300	Sargodha, Punjab	Awareness–behavior $r = .089$; concern $r = .484$ with behavior
14	Farooq et al. (2025)	Survey; (purposive); TPB, ELM	200 students	Lahore, Punjab	Social media explains 18.8% of awareness of smog initiatives, 4.6% of perception
15	Khan et al. (2025)	Mixed; secondary data; CLT	500 students and academics,	Khyber Pakhtunkhwa, Punjab, Gilgit-Baltistan	85% see crisis as severe; 94% willing to act; about 52% know policies
16	Alam et al. (2026)	Survey; (convenience)	350 students	Not specified	Social media top source; campaign participation lowest behavior item
17	Batool et al. (2026)	Online survey; social media users (convenience)	250	Punjab	Social media use predicts awareness ($\beta = .55$) and advocacy ($\beta = .52$)
18	Said et al. (2026)	KAP survey; university members (stratified random)	464	Peshawar and Kohat, Khyber Pakhtunkhwa	Attitudes 77–86% positive; practices 32–45%; awareness raises odds of action

Table 2. Evidence map: themes addressed by each study

Study	Awareness and Knowledge	Belief and concern	Sources and media use	Coverage and content	Action and behavior	Group differences
Bacha et al. (2021)	•	•	•		•	•
Qaisar et al. (2021)				•		
Barri & Shahzad (2022)				•		
Hanif & Arshed (2023)		•	•			•
Iqbal et al. (2023)	•		•		•	
Afsheen & Naz (2024)	•		•	•	•	
Ahmad et al. (2024)		•			•	•
Khalid (2024)	•		•			•
Khan & Hanif (2024)	•		•	•		
Safdar & Butt (2024)			•	•		•
Zaheer & Bano (2024)		•				
Alvi et al. (2025)				•		
Farhan et al. (2025)	•	•			•	
Farooq et al. (2025)	•		•			•
Khan et al. (2025)	•	•			•	
Alam et al. (2026)	•	•	•		•	

Batool et al. (2026)	●		●		●	
Said et al. (2026)	●	●	●		●	●
Total studies	11	8	11	6	9	7

Findings

What do people know?

Studies show that many people recognize that the climate is changing, but they tend not to know much about it, and what they know is uneven. Most people in Swat knew that the weather was changing, but many did not know what "climate change" meant (Bacha et al., 2021). More than half of those interviewed had no formal education. When asked what prevented them from understanding climate change, 18.6% said they lacked knowledge, 17.7% said they lacked information and 10.7% said they were illiterate. However, 60.1% said they thought it was caused by people (Bacha et al., 2021).

University surveys find that people tend to know more about climate change, but they often miss key elements. Among 464 students, staff and faculty in Peshawar and Kohat, 38.4% showed high awareness of climate change, 42.2% moderate awareness and 19.4% low awareness. Between 59.1% and 67.2% of the knowledge questions were answered correctly (Said et al., 2026). A survey of digital media users found similar patterns (Afsheen & Naz, 2024). Most respondents agreed that climate change exists and is largely driven by humans (mean score 4.6 out of 5). However, the mean score was only 3.2 out of 5 when they were asked whether they regularly read up on new developments in climate change.

Awareness of policy is often low. In one survey, only about half of the respondents said they knew of climate policies at government level (47% agreed and 5% strongly agreed), while 24% said they did not (Khan et al., 2025). Asked about the general population, 72% of the respondents believed that the public lacks awareness of and interest in climate change (Khan et al., 2025).

Two papers draw on other evidence of awareness at national level (Khalid, 2024; Khan & Hanif, 2024). They quote a UNICEF finding that only 27% of people could describe what climate change is. They also quote a finding from the UNDP and Viamo that 43% of digitally connected young people had a high level of understanding, against 10% of those without a mobile phone. These figures come from secondary sources and should be read as indicative.

What do people believe and feel?

Belief that the climate is changing is strong, and it often rests on lived experience. Hanif and Arshed (2023) asked 892 adults in Gilgit-Baltistan whether they thought climate change was occurring. Even in the district with the lowest figure (Shigar), 81.7% said they did. In the Upper Indus Basin, 96.9%, 97.0% and 93.6% of households in the upstream, midstream and downstream zones said they had experienced rising temperatures. Many also reported more dry days and lower crop yields (Ahmad et al., 2024). These perceptions matched the climate record.

In Swat, respondents reported rising temperatures (62.6%), more flooding (62.5%) and more drought (69%), and about 90% reported less snow (Bacha et al., 2021). In university and online samples, people who believe in climate change are often also concerned about it.

In one sample, 86.4% regarded climate change as a serious threat and 80.2% thought it was caused by humans (Said et al., 2026). In another, 85% thought the crisis was becoming more severe, 67% were strongly concerned about it, and 64% strongly agreed that human activity is the main cause (Khan et al., 2025). However, 66% of the same respondents said that personal and social issues matter more than climate.

Two studies explored the link between belief and feeling. Zaheer and Bano (2024) found that the perceived reality of climate change was linked to risk perception ($r = .301$) and to environmental values ($r = .316$). They also found that perceived consequences, and the sense that the problem is near in time and space, were linked to all three of their measures (r from .307 to .532).

Farhan et al. (2025) found that concern was linked to mitigation and adaptation behavior ($r = .484$). Taken together, these studies suggest that belief is rooted in experience and that people tend to feel more strongly about problems they see as real and near.

Where do people learn?

The answer depends on who is asked. In rural households in Swat, the role of the media was limited. Most often, people heard about climate change through local community meetings (72.2%), friends and family (27.6%), schools and colleges (12.7%) and personal observation (12%). Among the media, newspapers were more important than television and radio (Bacha et al., 2021). The authors explain that some households have no electricity and therefore no television or internet. Access matters elsewhere too: in Gilgit-Baltistan, receiving warnings on a mobile phone raised the odds of perceiving climate change (Hanif & Arshed, 2023).

University samples show the opposite pattern. In a sample of university students, the largest share named social media as their main source of information (40.1%), followed by television (28.5%), educational institutions (16.8%) and newspapers (9.5%) (Said et al., 2026). All 250 students in another study used social media, YouTube was the most used platform (50%), and 86.4% agreed or strongly agreed that social media improves environmental awareness (Iqbal et al., 2023). In a third study, social media was the most important source of climate information (mean 4.1 out of 5), although the students felt that the media tend to exaggerate the issue (Alam et al., 2026). Statistical links point the same way: social media use predicted climate awareness ($\beta = .55$) (Batool et al., 2026), and a correlation of .51 was found between digital media use and awareness (Afsheen & Naz, 2024).

Adults in four cities gave a different picture again. In Safdar and Butt (2024), 72.3% preferred electronic media (radio and television) to print (27.7%), and 73.6% agreed that traditional media are a good source of information on climate change. However, only 49.4% agreed and 7.8% strongly agreed that these media are credible, while 32.5% disagreed or strongly disagreed. Taken together, these studies suggest that there is no single "public" with a single media habit. Rural

households tend to learn from each other, students tend to learn from social media and city adults tend to learn from radio and television.

The same survey also shows that being a source is not the same as being an influence. In Safdar and Butt (2024), 63.7% disagreed that traditional media shape people's perceptions of climate change. Media use did rise with age ($r = .294$), and respondents who used these media more held stronger opinions on climate change ($r = .333$). Even so, the respondents did not credit the media with much influence.

This contrasts with the many students who said that social media increased their awareness (Iqbal et al., 2023).

What does the media supply?

Two content analyses show that environmental topics get attention in print, but not evenly. Qaisar et al. (2021) looked at four dailies (Jang, Express, The News and Express Tribune) over six months in 2015. They counted 2,864 items, made up of 1,934 news items and 930 pictures. Climate change was the most covered issue (656 news items), followed by waste management (571), water quality (413), air pollution (137), global warming (104) and noise pollution (53). The Urdu dailies published more items than the English ones. In another study, Barri and Shahzad (2022) examined editorials in two dailies and found a change in focus over time. In Dawn, climate change ranked first among environmental editorial topics in both 2018 (10 editorials, 32%) and 2019 (20, 42%). In Jang, it ranked third in 2018 (4, 10%) and second in 2019 (20, 31%), and water issues made up 70% of Jang's environmental editorials in 2018.

More items do not necessarily mean better quality, and other studies raise concerns about both. Khan and Hanif (2024) interviewed experts and journalists and found, for example, that news stories tend to be episodic, focusing on individual heat waves or floods. They also found that many gatekeepers lacked knowledge of climate science, that advertisers and corporations influenced the news, that journalists often self-censored, and that there was a gap between scientists and journalists. They also cite an analysis in which 87.4% of Dawn items and 98.6% of Jang items were episodic rather than thematic. Many readers seem to feel the shortfall. In a survey of readers (Safdar & Butt, 2024), 61.9% disagreed that traditional media give enough space to climate change, 49.4% disagreed that they highlight challenges in time, and 50.7% disagreed that they educate people on extreme heat, water scarcity and biodiversity. A majority (53.3%) also disagreed that the government runs campaigns on these media.

Social media are a different supply. Afsheen and Naz (2024) interviewed environmentalists and content creators and found that users prefer entertaining content, serious environmental posts struggle to hold attention, and some creators skip fact-checking, which can spread misleading information. Alvi et al. (2025) compared five government slogans, such as Clean Green Pakistan and Billion Tree Tsunami, with the hashtags that grew around them. Government slogans tended to frame environmental care as a patriotic and civic duty, while youth hashtags tended to be more emotional and participatory and drew on religious and local values. In both cases, however, the

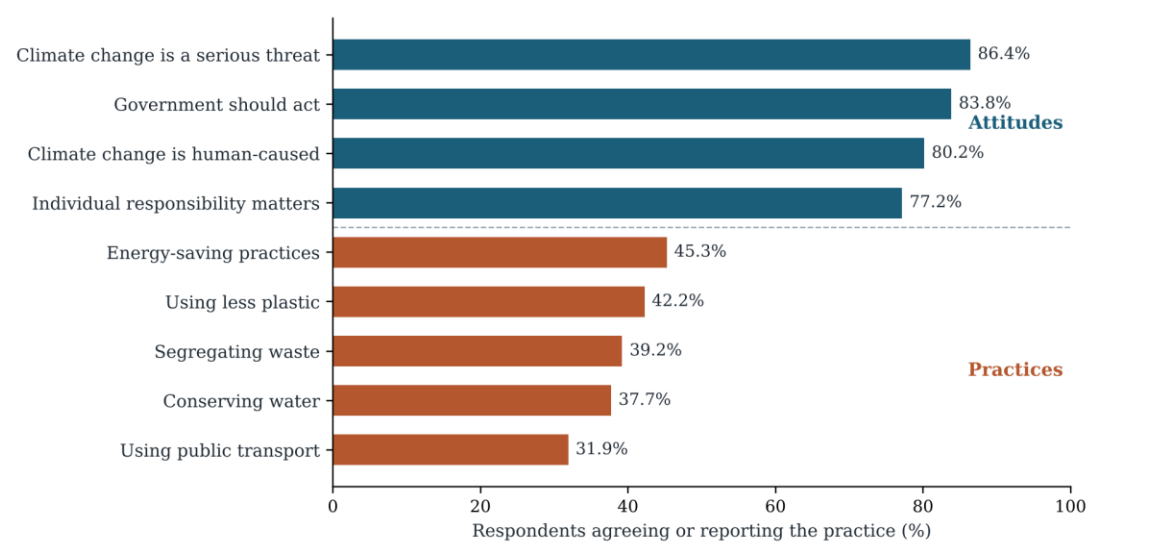
problem was oversimplified, and the focus was on individual action rather than systemic change. The newspaper studies cover 2015 and 2018–2019, so they may not describe current coverage.

The two language presses appear to serve different readers. The two studies of newspaper coverage in 2015 and 2018–2019 found differences between the English and Urdu papers, which may reflect different audiences. Barri and Shahzad (2022) suggest that the English-language Dawn speaks to a more educated readership than the Urdu-language Jang. Qaisar et al. (2021) report the perception that newspapers are read mostly by the less educated classes. These are the authors' interpretations and not tested findings, but they matter for campaigns, because the mix of issues differs by paper and the same problem may reach different audiences with a different emphasis. For example, in 2018 the environmental editorials in Jang focused mainly on water, whereas those in Dawn focused on climate change.

Does awareness lead to action?

This is where the evidence is most consistent. Several studies find that awareness and concern are much higher than action. The clearest example is Said et al. (2026), shown in Figure 2. More than three quarters of respondents held supportive attitudes, but far fewer reported matching practices. Only 31.9% used public transport, 37.7% conserved water, 39.2% separated waste, 42.2% used less plastic and 45.3% saved energy.

Figure 2. Attitudes and practices among university respondents in Peshawar and Kohat (Said et al., 2026)



Other surveys show the same gap. Afsheen and Naz (2024) found a mean of 3.92 for awareness and 3.56 for action, and Alam et al. (2026) found that participation in campaigns was the lowest-rated behavior item (about 3.4). In Iqbal et al. (2023), only 33.2% of students had commented on environmental posts. Khan et al. (2025) found that 94% of respondents were willing to take part

in mitigation, but willingness is not the same as action. In the same survey, 61% or more disagreed that the government handles climate vulnerabilities effectively. In Swat, 92.3% held the national government responsible for dealing with climate change, even though 57.4% believed that something can be done (Bacha et al., 2021).

Not every study agrees on how strong the link is. Said et al. (2026) found that positive behavior rose with awareness, from 46.7% in the low group to 60.2% in the moderate group and 79.8% in the high group, and the adjusted odds for the high-awareness group were 2.84 (95% CI 1.78–4.52). By contrast, Farhan et al. (2025) found that awareness was not significantly related to behavior ($r = .089$, $p = .123$). Knowledge did predict behavior in their regression ($\beta = .249$), but it explained only 6.2% of the variation, while concern was a much stronger correlate ($r = .484$). Batool et al. (2026) reported that social media use predicted advocacy ($\beta = .52$), but this was a self-selected sample of active users. Afsheen and Naz (2024) reported a correlation of .98 between awareness and action, which is unusually high and should be treated with caution. Overall, awareness appears to help, but it is rarely enough.

Respondents themselves see a role for institutions. In Iqbal et al. (2023), 65.2% strongly agreed and 24.4% agreed that environmental courses are needed in educational institutions, and in Said et al. (2026) educational institutions were already the third most common source of information (16.8%). In Swat, Bacha et al. (2021) found that schools and colleges were named by 12.7% of respondents.

Who differs?

Several studies compared outcomes between groups. In Gilgit-Baltistan, people with formal education, employment or a mobile phone warning of climate change were more likely to recognize it, and so were older people and men (the odds for men were 3.075 times those for women) (Hanif & Arshed, 2023). In the survey in Kohat and Peshawar, positive action was more likely among women (adjusted odds 1.54), people over 35 (1.68), postgraduates (1.67), staff and faculty (2.11) and people of higher socioeconomic status (1.89) (Said et al., 2026). Thus, in one study more men than women recognized climate change, while in another more women than men took positive action. In a third study, more men than women followed the government's smog campaigns on social media (Farooq et al., 2025).

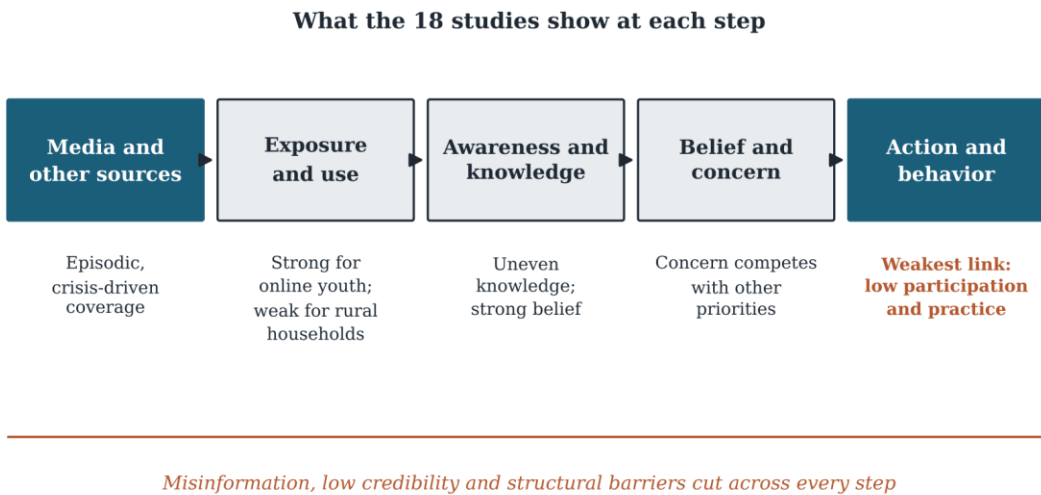
Other findings also turn on access. In Safdar and Butt (2024), views of traditional media were associated with age and education (age $F = 23.388$, $p < .001$; education $F = 3.498$, $p = .016$), but not with city ($p = .389$). Khalid (2024), reviewing secondary data, concludes that age, gender, education, income, region and social media use shape awareness. Said et al. (2026) found that high awareness was somewhat more common at the University of Peshawar (42.2%) than at Kohat University of Science and Technology (34.2%). Finally, Farooq et al. (2025) found that social media use explained 18.8% of the variance in awareness of the government's smog campaigns ($\beta = .434$) but only 4.6% of views of the campaigns ($\beta = .214$). Media use seems to raise awareness of a message more easily than it changes what people think of it.

Discussion

A chain that breaks at the last link

Read together, the studies describe a chain of five links: media and other sources, exposure and use, awareness and knowledge, belief and concern, and action (Figure 3). People tend to pick up a message from a source, come to know about it and form beliefs about it. The evidence is strongest for the links in the middle of this chain.

Figure 3. The information chain from sources to action, with the weakest link at action



The evidence for action at the end of the chain is weakest. In the studies that looked at behavior, action tended to lag behind awareness and concern. The studies point to several explanations. The first is that concern may matter more than knowledge. Farhan et al. (2025) found little link between knowledge and behavior but a strong link between concern and behavior. This suggests that campaigns supplying only facts will have a limited effect. The second explanation concerns the message. Khan and Hanif (2024) found that news of climate change tends to be episodic, and both official slogans and youth hashtags focus on individual duty rather than action by the system (Alvi et al., 2025). People who know they have a duty, but not what they can do or what the system will do, may remain aware but passive. The third is people's circumstances. Farhan et al. (2025) identify financial and infrastructure constraints. In Swat, 92.3% said it was up to the national government to act on climate change (Bacha et al., 2021), and in Khan et al. (2025) most respondents doubted that the government handles vulnerability well. The fourth is trust. Alam et al. (2026) found that many respondents fear the media exaggerate climate change, Safdar and Butt (2024) found limited credibility of traditional media, and Afsheen and Naz (2024) found that serious messages struggle to engage online users and that fact-checking is sometimes skipped. Taken together, the studies suggest that there are at least two groups of people in Pakistan with very different needs.

Two audiences with opposite problems

Rural, low-literacy households tend to have plenty of experience of climate change but little exposure to the media. They notice, for example, that summers are getting hotter, snow is less frequent and floods are more common, and their perceptions fit the climate record (Ahmad et al., 2024; Bacha et al., 2021). However, they rarely hear about climate change in the media and often do not recognize the term. Students and online users tend to be well informed, concerned and media savvy. They know the arguments for action, but not always what they can do about it, and few act on them.

One message will not work for both groups. The first group needs information in a form it trusts, for example at community meetings, through mobile phone warnings and in local languages. The second needs reasons and opportunities to act, with less emphasis on information. Most surveys included students, so the finding that social media is the main source reflects the groups surveyed more than the country as a whole. Few of the studies included less educated, older or rural people, and for these people the media seem least important.

Why do the studies disagree?

The studies disagree about the relationship between awareness and action, and the disagreement is informative. Said et al. (2026) found a strong relationship, but Farhan et al. (2025) found almost no relationship. The two studies differ in ways that may matter. The first used a stratified random sample of students, faculty and staff at two public universities and asked about specific behaviors. The second used a convenience sample in which 64% were students and 72.7% were aged 18 to 24, and it combined a range of behaviors into one scale.

A scale that mixes easy and difficult behaviors may hide differences, and a young, similar sample leaves little room for variation. The different results may therefore reflect study design and not real differences between places. A second disagreement concerns the media. Safdar and Butt (2024) found that most adults did not think their views were influenced by traditional media, whereas in student surveys many respondents pointed to strong effects of social media (Batool et al., 2026; Iqbal et al., 2023).

Taken together, we think it is fairer to say that media may support awareness among young, connected people than that they shape public opinion in general. These differences also show gaps in what the evidence can tell us.

None of the studies followed the same individuals over time, so none can show whether more media use leads to more awareness or whether people who already worry simply turn to more media. Until such studies are available, the best we can say is that concern, awareness and media use tend to go together, but we do not know which comes first.

Theoretical reading

Two of the theories used in the included studies help to read these results, although none was tested directly against the others. Agenda-setting suggests that media tell people what to think about.

Respondents in Safdar and Butt (2024) felt that climate change did not receive enough space, which implies a weak agenda-setting effect from traditional media. The Theory of Planned Behavior says that action follows attitudes, social norms and perceived control. The structural barriers that Farhan et al. (2025) describe, such as cost and infrastructure, can be read as low perceived control, which would explain why favorable attitudes do not become practice. These readings are offered as possible explanations and remain open to testing.

Practical implications

Table 3 turns the main findings into practical implications. They are drawn from a small group of studies and should be tested before being adopted at scale. Three points stand out. Messages must be matched to the audience, because rural and online groups have different needs. Campaigns should give people something to do, and not only something to know. Finally, trust has to be earned through accurate, regular and local reporting.

Table 3. Main findings and their practical implications

Finding	Practical implication	Supporting studies
Rural and low-literacy households rely on community gatherings, family and phone warnings more than on media.	Deliver climate messages through community meetings, schools, local languages and mobile alerts, not only through national media.	Bacha et al. (2021); Hanif & Arshed (2023)
Students and online users rely on social media, but passive exposure and low trust limit its effect.	Use credible, fact-checked and interactive content on social platforms, with sources named and calls to specific actions.	Said et al. (2026); Alam et al. (2026); Afsheen & Naz (2024)
Newspaper coverage is event-driven and episodic, and readers find it insufficient.	Support regular, solution-focused environmental reporting and training for journalists and editors, with links to scientists.	Khan & Hanif (2024); Safdar & Butt (2024); Barri & Shahzad (2022)
Awareness is much higher than action, and concern predicts behavior better than facts.	Design campaigns around concern, local relevance and concrete steps, and not facts alone.	Said et al. (2026); Farhan et al. (2025)
Many respondents look to government, and slogans stress individual duty over systems.	Pair public messages with visible government action, services and infrastructure that make action possible.	Alvi et al. (2025); Khan et al. (2025); Farhan et al. (2025)

Limitations and Future Research

Limitations of the evidence

The evidence is limited in several ways. Most of the surveys are cross-sectional and therefore show association, not causation. Eight of the 13 surveys relied mainly on educated respondents (for

example, students), and eight used non-probability samples. Behavior was mostly self-reported, which may lead to over-reporting of action because of social desirability. Media use was measured in different ways (for example, time spent, platform or content engagement), so findings are difficult to compare across studies. Some papers presented figures that did not agree with each other; where this happened, we included only the consistent figures. Only eight of the 18 studies used a named theory, and much of what is claimed about the impact of media comes from correlations in self-selected samples (Batool et al., 2026; Farooq et al., 2025).

Limitations of this review

We searched Google Scholar, Google Search and AI search tools. We did not search subscription databases (for example, Web of Science and Scopus), so we may have missed relevant work. We included only English-language, full-text studies published between 2021 and 2026. One person coded the studies, we did not assess their quality and no protocol was registered. Two documents were excluded because they had no data on perception, media or behavior.

Future research

Four directions stand out. First, many groups are under-represented in studies of media and behavior: less educated people, older people, rural populations and people in Sindh and Balochistan. Second, rather than asking only about intended action, studies should measure actual behavior (for example, through observation or records). Third, where possible, studies should follow individuals over time or assess a specific campaign, so that cause and effect can be examined. Fourth, studies of media use should measure exposure and engagement separately and should test which type of message (for example, local-language or solution-focused content) moves people from knowing to acting. Studies of water, waste and forests would also widen a literature that is now dominated by climate change and smog.

Conclusion

In this review of 18 studies, we asked what people in Pakistan know of climate change, where they get their information and whether they act on it. Three findings emerged. First, many people believe that the climate is changing, often on the basis of their own experience, but they tend to know little about it, particularly if they have little formal education. Second, people get their information from different sources depending on their age, place and education. Rural households turn to each other, students use social media, and city adults rely on radio and television. Newspaper coverage is often episodic, and readers find it inadequate.

Third, more people are aware of and concerned about climate change than act on it, and the link between awareness and action is weaker than campaigns assume. Taken together, these findings suggest that more attention should go to action than to information alone. Many people, particularly in rural and offline settings, still need more information, but for many others the missing step is not knowing but doing. Policy makers and the media should therefore pair credible information with engagement, practical support and concrete actions. Future studies should include a broader range of places and people and should examine what people do as well as what

they know. Until then, claims about the power of the media to change behavior in Pakistan should stay modest.

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