Jurnal Kajian Komunikasi, Volume 13, No. 2, December 2025, pp. 258-279
https://doi.org/10.24198/jkk.v13i2.68449

Why do people seek information about PM2.5 air pollution? A theory of planned behaviour perspective

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Submitted: 3 December 2025**, Revised:**17 December 2025**, Accepted:** 18 December 2025, **Published:** 31 December 2025

ABSTRACT

Background: PM2.5 is a hazardous pollutant that affects human health. Therefore, initiatives to seek information about this air pollution are important so that individuals can be prepared to protect themselves from the dangers of this pollution. **Purpose:** To examine psychosocial factors in predicting information-seeking intent about PM2.5, and how this intention is related to seeking behaviour regarding PM2.5. **Methods**: A cross-sectional survey was applied in six provinces on Java Island. A total of 385 respondents were recruited in this study using convenience sampling. PLS-SEM was applied to analyse the collected data and answer the hypotheses. **Results:** The results reveal that the three psychosocial factors, namely attitude, subjective norms, and perceived behavioural control, significantly affects intention, and subsequently intentions influenced PM2.5 information-seeking behaviour. Another finding also shows that intention can mediate the association between psychosocial factors and information-seeking behaviour. **Implication:** Theoretical and practical implications are discussed based on the results of this study, including that these findings are useful in the development of health and environmental risk communication, particularly in relation to air pollution in Indonesia. Interventions with a multi-component strategy that addresses attitudes, norms, and perceived control would have the most impact on the development of long-term information-seeking behaviour regarding PM2.5 air pollution.

Keywords: PM2.5 air pollution; psychosocial factors; information seeking; health risk; planned behaviour

To cite this article (APA Style):
Amin, K., & Budiarsa, Y.T. (2025). Why do people seek information about PM2.5 air pollution? A theory of planned behaviour perspective. *Jurnal Kajian Komunikasi*, *13*(2), 258-279. https://doi.org/10.24198/jkk.v13i2.68449

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ISSN: 2303-2006 (print), ISSN: 2477-5606 (online). Website: http://jurnal.unpad.ac.id/jkk

INTRODUCTION

Ambient air pollution has become one of the most significant determinants of morbidity and mortality worldwide. Delicate particulate matter with an aerodynamic dimension of less than 2.5 micrometres is among its most harmful components (Burnett et al., 2018; Cohen et al., 2017; US EPA, 2016). Being small, PM2.5 particles may overcome the upper respiratory defences and penetrate deep into the pulmonary alveoli, reaching the bloodstream, where they cause systemic inflammation, oxidative stress, and endothelial dysfunction (Brook et al., 2010; US EPA, 2016; Vincent, 2019). There exists a substantial amount of epidemiological evidence indicating that chronic and acute PM2.5 correlates with the risks of cardiovascular disease, respiratory illness, lung cancer, and premature death (Burnett et al., 2018; Cohen et al., 2017). Besides physical health outcomes, exposure to PM2.5 has been linked to adverse pregnancy outcomes, lower lung development in children, and an increase in the severity of already existing chronic conditions (US EPA, 2016; Vincent, 2019).

Recent economic evaluations also indicate that the health costs of PM2.5 exposure are high in healthcare systems and productivity, especially in low- and middle-income countries (World Bank & Institute for Health Metrics and Evaluation, 2016). These convergent findings clearly show that PM2.5 is a serious environmental health concern that requires collective policy initiatives and good health communication to limit its effects on people (Burnett et al., 2018; Cohen et al., 2017; World Health Organization, 2021).

Due to growing evidence of health risks associated with particulate matter, the World Health Organization (WHO) has produced Global Air Quality Guidelines (AQGs), which are science-based criteria for safe air pollutants such as PM2.5 (World Health Organization, 2021). The WHO AQG advocates a stricter standard for PM2.5, with a 24-hour mean of 15 $\mu g/m^3$ and an annual mean of 5 $\mu g/m^3$, based on evidence that negative health impacts can still occur at low levels of exposure (US EPA, 2016; World Health Organization, 2021). The guideline values serve as reference points to evaluate the severity of air pollution and to classify health risks associated with varying concentrations (World Health Organization, 2021).

Most countries base national standards and air quality index (AQI) frameworks on WHO AQG thresholds, or at least coordinate the two, allowing policymakers and government agencies in the field of health to relay the relative risk of pollution events to the population (World Health Organization, 2021). The WHO also stresses that no "safe" dose of PM 2.5 exposure can be identified and that any lowering of the levels may provide significant health gains, especially to communities at risk of serious health problems like children, the elderly and patients with cardiovascular or respiratory underlying conditions (World Health Organization, 2021).

Indonesia is not an exception and is one

of the countries in Southeast Asia where the indicators of PM2.5 often exceed the WHO standards; the situation is dire in large cities and industrial regions (IQAir, 2024; World Health Organization, 2021). The peaks of PM2.5 pollution are regular in cities like Jakarta, Surabaya, Bandung, and Palembang. They are a result of the combination of local sources, i.e., vehicular emissions, industrial activity, coal-fired power plants, and residential burning, as well as the haze in the region caused by forest and peatland fires (Santoso et al., 2020; Syuhada et al., 2023).

The capital of the country, Jakarta, has been repeatedly rated as one of the most polluted cities in the world, and the daily PM2.5 levels in the city often relate to the category of "unhealthy" or worse on popular air quality monitoring sites (Clean Air Catalyst, 2025; IQAir, 2024). The historical records of long-term monitoring show that the average PM 2.5 levels in Jakarta have traditionally been several times higher than the AQG developed by the WHO, although recent years have shown specific changes due to time-related factors and policy-making (Santoso et al., 2020; Syuhada et al., 2023). These circumstances have increased the daily concern of the population regarding air quality, sparked legal and policy discussions, and heightened the need for valid environmental health information that can inform personal and social responses to the PM2.5 threat (Clean Air Catalyst, 2025).

With these conditions of long-lasting and even non-evident environmental risk, timely, correct, and interpretable environmental health information is of paramount importance in safeguarding the health of the population. Comprehensible data on PM 2.5 concentrations, health effects, and recommended preventive actions enable people to make educated decisions about outdoor activities, mask usage, and air cleaner use, and to advocate for cleaner air policies (Chen et al., 2024; Luangwilai et al., 2025). The dissemination of digital technologies, including mobile applications, inexpensive sensors, and web-based dashboards, has significantly increased access to real-time air quality information for the general public (Liu et al., 2021).

Nevertheless, the increased accessibility does not necessarily lead to successful knowledge or utilisation. Citizens may struggle to grasp technical measures, such as micrograms per cubic meter, AQI scales, and color-coded health categories, without clear explanations (Hou et al., 2021). Garcia-Retamero et al. (2019) and Ramirez-Andreotta et al. (2016) found that an individual's level of numeracy, environmental literacy, and health literacy impacts their comprehension of complicated risk, such as pollution and risk information. Moreover, the existence of conflicting sources of information, errors, and discrepancies in risk communication throughout the government, social media, and the media can also be viewed as a contribution to confusion or distrust (M. Liu et al., 2021). These challenges emphasize the need to not only inform people, but how and whether individuals are actually interested in gaining knowledge about environmental health

in the first place.

The concept of information seeking is viewed as one of the preventive behaviours from a health communication perspective, where individuals endeavour to lessen uncertainty, increase perceived control, and devise methods to reduce risk (Li et al., 2025). Faced with a chronic environmental hazard such as PM2.5 pollution, individuals who are expected to seek information will have a higher chance of tracking air quality patterns, understanding the health effects, and following recommended protection measures (World Health Organization, 2024; Q. Yang & Wu, 2020). Deliberation to enquire information, therefore, serves as a proximal cognitive process that connects the awareness of risk to the subsequent behavioural involvement in information-seeking behaviours, including checking apps, visiting government websites, or receiving expert information in the news and on social media (Ju et al., 2023; Willoughby & Myrick, 2016; Yoo, 2021).

The previous theoretical models in the field of risk and health communication, such as information-seeking and processing models, have highlighted that the information-seeking decision is an outcome of motivational and capability-based decision-making (Ju et al., 2023; Q. Yang & Wu, 2020). The intention to seek information is also a key concept in the context of PM2.5, since the pollutant is not directly visible, the risk is commonly perceived as abstract or chronic, and decision-making should continuously change depending on the changing amounts of the pollution (Griffin et al., 2013; M. Liu et al., 2021).

A large body of study has been written on what motivates people to seek knowledge about health and environmental risks. According to the previous studies, cognitive evaluations including perceived severity, perceived benefits, perceived hurdles, and perceived vulnerability associated with whether or not people seek information (Ju et al., 2023; Volkman et al., 2023; Willoughby & Myrick, 2016; Q. Yang & Wu, 2020). Feelings of worry, fear, and anger have also been identified as driving individuals to seek information that aids them in dealing with uncertainty or perceived inability to control (Li et al., 2025; P. L. Liu, 2020; Volkman et al., 2023).

The decision about information seeking may be further facilitated by social factors, such as interpersonal norms, in-family and community communication, and health practitioners' advice, which indicate the social desirability or need to seek information (Liu et al., 2021; Willoughby & Myrick, 2016). Besides that, self-efficacy and collective efficacy over finding, learning, and using information have consistently been linked to a higher amount of information seeking, primarily when focusing on digital sceneries that demand a certain level of media and health literacy (Ajzen, 1991; McEachan et al., 2011).

Most of these determinants have been incorporated in conceptual models like the Risk Information Seeking and Processing (RISP) Model and the Planned Risk Information Seeking Model (PRISM), which have been

utilised in a variety of health concerns, including environmental hazards, infectious disease outbreaks, vaccination, and more (Kahlor, 2010; Y. Liu et al., 2025; Volkman et al., 2023). Nevertheless, despite these contributions, comparatively few studies have been conducted regarding information seeking in the context of PM2.5 air pollution in areas like Indonesia, where information infrastructure is evolving, and environmental hazards are high.

Although prior research has identified multiple determinants of health risk information seeking, several important gaps remain that justify the present study. First, existing studies have concentrated mainly on disease-focused contexts—such as cancer, influenza, COVID-19 vaccination, and natural disasters—rather than chronic environmental pollutants like PM2.5 that are pervasive but less visible (Hovick et al., 2014; M. Liu et al., 2021; Willoughby & Myrick, 2016).

Second, while models such as RISP and PRISM incorporate a variety of cognitive, affective, and social variables, there is comparatively limited empirical work that systematically investigates core psycho-social constructs from the Theory of Planned Behaviour (TPB), such as attitude, subjective norms, and perceived behavioural control (PBC) as predictors of environmental health information-seeking intention (Kahlor et al., 2019; S. Liu et al., 2018).

Third, studies that do apply TPB to environmental behaviours often examine outcomes such as recycling, energy conservation, or support for environmental policy, rather than the specific behaviour of seeking information about air pollution (Bamberg & Möser, 2007; McEachan et al., 2011). In the Indonesian context, where urban residents face recurring episodes of severe air pollution and public discourse around air quality is growing, it is particularly urgent to understand which psycho-social factors encourage or inhibit information seeking about PM2.5. By addressing these gaps, the total impact of using TPB to environmental health communication will be expanded, and empirical data will be gathered that can be utilized to create targeted communication interventions to improve the uptake of PM2.5 risk information (Ajzen, 1991; McEachan et al., 2011).

To examine the psycho-social antecedents of PM 2.5 information seeking, the present research uses the TPB as its primary theoretical framework. TPB identifies three major constructs of behavioural intention, which are attitude toward the behaviour, the subjective norms and PBC (Ajzen, 2020). TPB has also received considerable backing in the projection of various health and environmental behaviours, such as preventative health, lifestyle changes, and pro-environmental behaviour (Amin et al., 2023; Armitage & Conner, 2001; Bamberg & Möser, 2007; McEachan et al., 2011).

Using TPB in exploring information seeking in relation to PM2.5 can provide a systematic exploration of the perceptions of information seeking behaviour of individuals, the affecting influence of social expectations

on their motivational drive and the perceived ability to manage information environment. Thus, the study can fill the gap in theory-based research on the subject matter of environmental health communication, as well as integrate a clear structure of behaviour with the urgency of air pollution in Indonesia (Bamberg & Möser, 2007; M. Liu et al., 2021).

According to this theoretical framework and research gaps revealed, the following general research question may be used in the study How much attitude, subjective norms, and PBC influence the intention to seek information about PM2.5, and how the intention affect actual information-seeking behaviour? The study attempts to achieve two primary objectives in order to provide the answer to this research issue. First, it looks at how attitude, subjective norms and PBC affect the intention of the people to obtain information regarding PM2.5.

Second, it assesses whether intention to seek information predicts self-reported behaviour of seeking information about PM2.5 in the Indonesian urban context. By addressing these objectives, the study aims to contribute to theory-building in health and environmental communication as well as to provide evidence that can inform practical interventions to enhance public engagement with PM2.5 risk information.

Within the TPB, attitude toward a behaviour is expected to exert a positive influence on the intention to perform that behaviour. In the context of this study, attitude toward seeking information about PM2.5 refers to the extent to which individuals evaluate this behaviour as beneficial, important, and worthwhile. Prior studies in health communication have repeatedly shown that individuals with more positive attitudes toward seeking health-related information, such as viewing it as helpful for prevention or decision making, are more likely to intend to engage in information-seeking activities (Hovick et al., 2014; L. Kahlor, 2010; Willoughby & Myrick, 2016).

Given this evidence, it is reasonable to expect that individuals who perceive seeking PM2.5 information as valuable for protecting their health and the health of their families will exhibit stronger intentions to seek such information. Accordingly, the study proposes the following hypothesis: **H1:** The attitude toward seeking information about PM2.5 is positively associated with the intention to seek information about PM2.5,

Subjective norms capture perceived social pressures or expectations from important referent others—such as family members, friends, co-workers, or community leaders—regarding whether one should perform a particular behaviour. In collectivistic cultural contexts, social expectations and norms are often particularly influential in shaping health and environmental behaviours (Ajzen, 2020; Hofstede, 2001). Prior research grounded in TPB has demonstrated that when individuals perceive that significant others expect them to obtain health information or stay informed about risks, they report stronger intentions to seek information (Hovick et al., 2014; M. Liu et

al., 2021; Willoughby & Myrick, 2016). Within the context of PM2.5 pollution, if individuals perceive that those around them believe it is critical to track air quality or follow news about pollution levels, they may be socially pressured to seek out this information. On this basis, the study posits the following hypothesis: **H2**: The subjective norms are positively associated with the intention to seek information about PM2.5.

The PBC refers to an individual's beliefs about their ability and means to carry out the behaviour under consideration. PBC in seeking information about PM2.5 is defined in this case as the ease or difficulty of locating, comprehending, and utilising air quality information from multiple avenues, via mobile applications, websites, and news media, among others. Past studies involving TPB have continuously shown that increased PBC correlates with increased behavioural intentions, especially those practices that include behavioural actions that require mental effort, technological availability, or special competencies (Ajzen, 1991; Armitage & Conner, 2001; McEachan et al., 2011). When individuals feel confident in their ability to navigate digital platforms, interpret AQI values, and evaluate the credibility of environmental information, they are more likely to intend to seek information about PM2.5. (M. Liu et al., 2021; Norman & Skinner, 2006). Therefore, the study advances the following hypothesis: **H3:** PBC is positively associated with intention to seek information about PM2.5.

Finally, TPB assumes that intention is the most proximal predictor of actual behaviour, provided individuals have sufficient control over the performance of the behaviour. In the domain of health and environmental communication, numerous studies have demonstrated that stronger intentions to seek information are associated with more frequent and consistent information-seeking behaviours (Kahlor, 2010; McEachan et al., 2011; Q. Yang & Wu, 2020). Individuals seeking information about PM2.5 are required to be more active in monitoring air quality statistics, reading relevant news, and contacting institutional or expert sources. Therefore, this study proposes: **H4:** Intention to seek information about PM2.5 is positively related to information-seeking behaviour concerning PM2.5. The study's objective is to clarify the psycho-social factors underpinning environmental health information seeking in an urban Indonesian context typified by chronic PM2.5 pollution.

RESEARCH METHOD

A cross-sectional survey design was used in this study. Informed consent was received at the commencement of the questionnaire to guarantee the voluntary participation of respondents. The target demographic comprises Indonesian individuals aged 18 years and above from six province of Java Island. Data collection conducted via an online survey, utilizing Google Form links dispersed to the researcher's personal network across numerous platforms, including WhatsApp, Instagram, and Facebook. Additionally, participants were asked to share

the survey with individuals in their network who met the study's requirements.

This study employed G*power to calculate the minimal sample size. three predictors of seeking intention are included in this study, which aims for a statistical power of .80, an alpha error of .05, and an anticipated effect size of.15 (medium). As a result, 77 is the minimal sample size needed. The results will be statistically robust and dependable for social research, as the sample size will provide a statistical power that surpasses 80% (Hair et al., 2019; Hair & Sarstedt, 2019). Utilizing convenience sampling is predicted to boost the number of respondents, hence enhancing the confident findings for Indonesia's diverse population. In fact, the study acquired 385 respondents who fully completed the questionnaire, allowing for data analysis.

The TPB constructs are examined in this study in relation to seeking intention. Unless otherwise noted, this study's measurement of constructs heavily draws from earlier studies that use the same constructs, such as Ho et al. (2014). Volkman et al. (2023), and Yang and Wu (2021). The measurement of attitude toward seeking involved four items. The sample items include "seeking information about PM2.5 pollution is valuable," "seeking information about PM2.5 pollution is good," "seeking information about PM2.5 pollution is beneficial," and "seeking information about PM2.5 pollution is helpful." The subjective norms regarding information-seeking were assessed through three items, including statements like "People close to me suggest me to seek information about PM2.5 pollution," "My friend encouraged me to seek information about PM2.5 pollution," "People around me are looking for PM2.5 pollution information" and "My family members are looking for PM2.5 pollution information." PBC over seeking was measured with four items, including statements like "It is easy to find PM2.5 pollution information" and "You are able to find PM2.5 pollution information." Seeking intention was measured using three items, including statement like "I want to seek information about PM2.5 pollution," "I intend to seek information about PM2.5 pollution," and I will seek information about PM2.5 pollution. Last, the seeking behaviour was measured using one item that ask respondent "How often do you seek information about PM2.5 pollution in a week?". Responses were evaluated using a 5-point scale, with options ranging from 1 (strongly disagree) to 5 (strongly agree).

The collected data was analysed using Partial Least Square-Structural Equation Modelling (PLS-SEM) with SmartPLS 4.0 to assess the measurement and structural models. In order to evaluate discriminant validity, convergent validity, and reliability, the measurement model must be evaluated. Meanwhile, the structural model is important to explore the interactions between observed constructs in order to answer the hypotheses.

RESULTS AND DISCUSSION

Table 1 shows that the respondents consisted of 40.5% male and 59.5% female with a mean

age of 24.48 (SD = 4.93). The majority of respondents are from East Java (29.6%), and the rests are from Central Java (19.7%), West Java (18.7%), Jakarta (16.4%), Yogyakarta (8.3%) and Banten (7.3%). In terms of educational level, the majority is undergraduate (51.9%), followed by high school (37.9%), postgraduate (6%) and diploma (4.2%). Furthermore, a large number of respondents reported that their health condition is very good (60.8%) and good (33.5%). Thera are few respondents that their condition is not good enough.

This study did not encounter any problems in terms of measurement validity and reliability. This can be seen from the evaluation of discriminant validity; the constructs did not encounter any problems because each HTMT value was below 0.9 (in Table 2). In terms of convergent validity, the evaluation shows that all outer loading items are above 0.70, and the AVE values of each construct are above 0.50, meaning that the items and constructs meet all convergent validity standards (in Table 3). This is reinforced by all Cronbach Alpha and Composite Reliability values of the constructs being above 0.7, indicating that the measurements in this study are reliable.

Table 1 Respondents' characteristics

Demography	Frequency (N=385)
Gender (%; F / M)	59.5 / 40.5
Age (Years; M ± SD)	24.48 ± 4.93
Provincial Origin (%)	
Jakarta	16.4
Banten	7.3
West Java	18.7
Central Java	19.7
Yogyakarta	8.3
East Java	29.6
Education (%)	
High school	37.9
Diploma	4.2
Bachelor	51.9
Master	5.2
Doctorate	.8
Health Condition (%)	
Very Bad	.3
Bad	1.3
Not Bad	4.2
Good	33.5
Very Good	60.8

Source: Data processed by Authors, 2025

This study also examined Common Method Bias (CMB) based on Variance Inflation Factor (VIF) values, and the results showed that all hypothesized relationship had VIF values below 3.3, indicating that there were no common method bias issues. Model fit also showed good results with an SRMR value of 0.056 < 0.08 and NFI of 0.861, indicating that the model adequately represented the observed data (Hair et al., 2019).

Bootstrapping was applied to evaluate the structural model and answer the hypotheses in this study. Figure 1 shows that intention to seek PM2.5 pollution information is directly and positively related to attitude ($\beta = .399$, $p < .001$), subjective norms ($\beta = .200$, $p < .001$), and PBC ($\beta = .240$, $p < .01$). Therefore, **H1**, **H2**, **H3** were supported. **H4** also received support because the result revealed that intention to seek information positively associated with seeking behaviour about PM2.5 pollution ($\beta = .507$, p

Table 2 Discriminant Validity (Heterotrait-Monotrait)

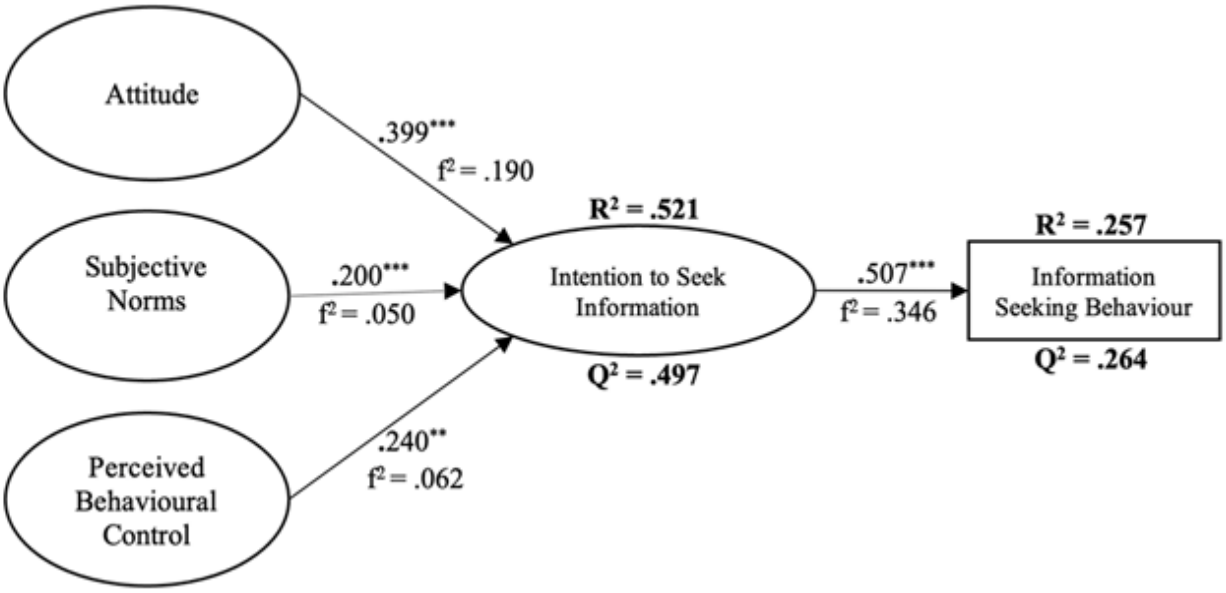
Construct	1	2	3	4	5
1) Attitude	-				
2) Subjective Norms	.610	-			
3) PBC	.728	.704	-		
4) Intention	.723	.618	.681	-	
5) Behaviour	.566	.421	.461	.522	-

Source: Data processed by Authors, 2025

Table 3 Convergent Validity and Reliability

Construct	Item	Outer Loading	AVE	α	CR
Attitude	ATD1	.884	.737	.880	.918
	ATD2	.890			
	ATD3	.833			
	ATD4	.824			
Subjective Norms	SJN1	.849	.700	.858	.903
	SJN2	.853			
	SJN3	.812			
	SJN4	.831			
PBC	PBC1	.745	.667	.834	.889
	PBC2	.837			
	PBC3	.850			
	PNC4	.831			
Intention to Seeking	ITS1	.925	.886	.935	.959
	ITS2	.958			
	ITS3	.940			

Source: Data processed by Authors, 2025



Source: Data processed by Authors, 2025

Figure 1 Structural equation model with path coefficients and its significance

Note: *p < .05, **p < .01, ***p < .001; $f^{2=} \geq 0.02$ (Small), $f^{2=} \geq 0.15$ (medium). $f^{2=} \geq 0.35$ (Large)

< .001). In addition, another finding in Table 4 also revealed that intention to seek PM2.5 pollution information significantly mediated the relationship between seeking behaviour and attitude (β = .204, p < .001), subjective norms (β = .101, p < .001), and PBC (β = .122, p < .001). The R2 value indicates that the exogenous variables explain 32.5% of the variance in intention and 30% of the variance in behaviour. In terms of effect size (f^2), each hypothesized relationship shows a small to substantial effect size. Furthermore, the predictive relevance (Q^2) of this study is moderate.

The research aimed to investigate the effect of attitude, subjective norms, and PBC on intention to acquire information about PM2.5, which, in its turn, would affect the actual information-seeking behaviour in the context of air pollution caused by PM2.5. According to the TPB, the results exhibit that the three psycho-social predictors, such as attitude, subjective norms and PBC, have significant relationships with the intention to obtain information on PM 2.5. It was demonstrated that the intention was considerably connected to the self-reported behaviour of collecting information about PM 2.5. The results are aligned with the fundamental assumptions of TPB, which pose that the intention is formed by an interaction of attitude, social pressure and perceived control and intention is the nearest predictor of behaviour (Ajzen, 2020). Therefore, the overall trend gives an a priori justification to applying TPB in environmental health information-seeking, which broadens the use of the theory to other health and environmental behaviours (S. Liu et al., 2018; Parveen & Ahmad, 2020; X. Yang et al., 2020).

Table 4 Indirect Effects

Path Coefficient	β	Decision
Attitude → Intention to Seeking → Information Seeking Behaviour	.204***	Supported
Subjective Norms → Intention to Seeking → Information Seeking Behaviour	.101***	Supported
PBC → Intention to Seeking → Information Seeking Behaviour	.122**	Supported
Statistically significant in *p < .05, **p < .01, ***p < .001		

Source: Data processed by Authors, 2025

The correlation between attitude and intention is quite strong as those individuals who believe that the need to seek information about PM 2.5 is helpful, necessary, and useful have high chances of the intention to produce this behaviour. This outcome is consistent with the findings of previous researchers that have found the existence of positive attitudes towards health information seeking (including the idea that information could be used to prevent disease, reduce uncertainty, or make decisions) to be some of the strongest antecedents of information-seeking intentions in numerous health contexts (S. Liu et al., 2018; Parveen & Ahmad, 2020; X. Yang et al., 2020). In the given case of PM2.5, as the pollutant that is largely invisible, and is often considered a chronic threat rather than an acute threat, the residents may be forced to accept the value of knowing about the problem and understanding the air quality data or seek professional advice (Kelly & Fussell, 2015). The results indicate that the formation of the positive attitudes can be one of the crucial aspects of the interventions that help to enhance the intention to seek information about PM2.5. This is the individual and family health interests of being informed on the level of pollution and whether or not to take some preventive action. This finding also justifies the overall generalisation of TPB-based research, which imply that attitude is often one of the strongest antecedents of intention in the case of an action that involves cognitive deliberation and is risky and beneficial (Liu et al., 2018).

The researchers also found subjective norms to have significant relationship with intention to seek information about PM 2.5 meaning that social influence had a great impact on influencing information-seeking motivation. By creating a feeling in people that some important individuals (family members, friends, colleagues, and even local authorities) would like to know about the quality of air, they will desire to find their information about PM 2.5 in the future even more. This result aligns with the past research on TPB that confirms that the perceived

social pressure or normative expectations may be a powerful influence on health and environmental behaviour intentions (Aydin & Aydin, 2022; Pai et al., 2024; Willoughby & Myrick, 2016). Subjective norms can even have an even stronger impact on information-seeking behaviour when the social approval and mutual norms are particularly salient as a feature of collectivistic or community-based setting (Fauk et al., 2022; Setiawan et al., 2021). As the problem of air quality gains more and more relevance in the Indonesian urban setting, the concept of PM 2.5 monitoring as a socially valuable and communally necessary notion can be potentially supported by people-to-people communication and interactions on social media (Buvár et al., 2023; Litvin et al., 2024; Matias, 2019; Suryaputra et al., 2024). These outcomes suggest that intervention approaches involving social norms, including the use of community role models, health professionals, or influential opinion leaders to communicate the necessity to develop informed air quality consciousness might be effective in developing the desire to learn about PM2.5.

The PBC was also a strong predictor of intention showing that the belief that people have of being able to seek, perceive and use information about PM 2.5 plays a significant role in predicting their intentions towards seeking information about PM2.5. It is important to add that the given result is in line with the assumption of TPB according to which PBC affects intention in particular, particularly when the behaviour under consideration is the skills, resources, and/or accessibility to certain tools (Ajzen, 2020; Sun et al., 2021). In case with PM2.5, individuals might be required to make use of online resources and have information about technical indicators, including AQI scores, to retrieve precise data by checking the reliability of multiple sources of data. The literature on the topic has indicated that greater PBC over information-seeking, particularly online information-seeking, is predictive of increased online health resource use and risk information-seeking intentions (Link et al., 2024; Wang et al., 2021; Wijayanti et al., 2022). The current results emphasise the fact that the perceived ability of people, such as the ability to access better air quality indicators, easier mobile app interfaces, and programs that can help increase e-health and environmental literacy, can stimulate more intentions to learn about PM2.5. This supports the overall point that it is not enough to motivate people; they should also believe that they possess the necessary abilities and means to take action (Ajzen, 2020).

In line with the TPB, this study showed an essential connection between intention and actual information-seeking behaviour concerning PM 2.5. Those with stronger intentions to receive PM2.5 information are more likely to use it via consulting air quality applications, pollution news, or governmental and expert sources. The result will confirm the size of the body of existing empirical evidence indicating that intention is a strong proximal predictor of behaviour in health and environmental contexts (Fish et al., 2022, p.

202; Pai et al., 2024; Shamlou et al., 2022). The intensity of this relationship implies that the attempts to strengthen the intention, through the influence of personal beliefs, social norms, and perceived control, are likely to be converted into changes in the information-seeking behaviour. At the same time, the intention-behaviour relationship is not often close-knit, and prior studies have found that numerous contextual or structural variables (e.g., time constraints, access barriers, or competing priorities) can moderate the intention-behaviour relationship (Conner & Norman, 2022). However, the current findings affirm that intention is an important process by which psychological and social factors shape actual participation in PM 2.5 environmental health information.

Notwithstanding its contributions, this study includes a number of limitations that should be taken into account and offer guidance for future research. First of all, it is impossible to demonstrate causal links between attitude, subjective norms, PBC, intention, and behaviour using a cross-sectional methodology; a longitudinal or experimental design would be more appropriate to investigate temporal sequence and causality (Caruana et al., 2015). Second, self-reported information-seeking behaviour measures were used in the study, and these can be subject to recall and social desirability bias, potentially overestimating the observed relationships (de Vreese & Neijens, 2016). Subsequent research may help to enhance self-reporting with behavioural markers, such as mobile application log data or site analytics data, which allow real-time access to information. Third, the respondents were restricted to urban areas in Indonesia, which may limit the results' relevance to rural areas or other countries with distinct cultures, socioeconomic situations, and environmental factors. Future research could give comparison statistics for places or countries with varying air pollution levels, internet infrastructure, and cultural orientations.

This study has various theoretical implications for the health communication and environmental risk communication scholarship. To start with, this study will increase the range of applicability of TPB in environmental health information-seeking by providing evidence that personal beliefs, subjective norms, and PBC are significant predictors of intention to seek PM 2.5 information. That intention is predictive of behaviour in an urban air pollution setting. This paper contributes to the existing literature by demonstrating that core TPB constructs retain explanatory power in an area where risks are persistent, often invisible, and frequently overlooked due to the complexity of the technical information. Second, the findings complement currently available models of risk information seeking, including RISP and PRISM, in terms of centralising the constructs of TPB in the larger multivariate models of risk communication. This implies that it is possible to fruitfully combine the TPB with risk information-seeking models to understand both the motivational and capability-associated processes that lead to information seeking regarding environmental

hazards. Third, the empirical data from an urban setting in Indonesia contribute to the still relatively limited literature that utilises TPB for environmental health communication in low- and middle-income nations, thereby bridging gaps in the literature due to geographical and contextual factors. All these contributions justify the usefulness of the TPB as a theoretical framework for explaining why and when people seek environmental health information.

This study also provides valuable practical implications to policymakers, the public health authorities, and communication practitioners interested in improving the population's awareness of PM2.5. The role of attitude as a decisive factor implies that the messages of communication campaigns should focus on the real benefits of staying informed about air quality, i.e., by associating information-seeking behaviour with family health protection, disease prevention, and quality of life. The high impact of subjective norms suggests that social influence can be leveraged in interventions by inviting respected community members, healthcare workers, educators, and digital influencers to demonstrate and recommend regular monitoring of air quality data. Information seeking that is framed through public messaging about information-seeking as a socially expected behaviour may be particularly effective in collectivistic contexts. PBC is also crucial, which is why structural and cognitive barriers to information seeking should be reduced. This includes making air quality apps easier to use, giving graphic and simple descriptions of air quality indices in local languages, and encouraging digital and health literacy through educational programs. Finally, because intention influences behaviour, interventions with a multi-component strategy that addresses attitudes, norms, and perceived control would have the most impact on the development of long-term information-seeking behaviour regarding PM2.5 exposure. These efforts may eventually lead to more knowledgeable, powerful, and health-protective communities when it comes to solving the current air pollution concerns.

CONCLUSION

These results directly fulfil the study's objectives. First, with respect to examining the psycho-social determinants of intention, the evidence confirms that attitude, subjective norms, and PBC all contribute meaningfully to the formation of intention to seek information about PM2.5. The pattern aligns with TPB's core proposition that cognitive evaluations, perceived social pressure, and perceived capability jointly shape behavioural intentions. Second, regarding the objective of assessing whether intention predicts actual behaviour, the study finds that higher intention is translated into more frequent and active information-seeking behaviour. Thus, the proposed TPB-based model is empirically supported in the specific context of environmental health information seeking about PM2.5 in an Indonesian urban setting. Finally, the study shows that the intention to seek information about PM2.5

is strongly predicted by attitude, subjective norms and the PBC, and intention, in its turn, is strongly predicted by the actual information-seeking behaviour. A better comprehension of these pathways does not only help answer the question that is guiding the study but also offers a theoretically informed foundation on formulating communication interventions and policies that would foster smarter and health-saving responses to PM 2.5 pollution.

Author Contributions: Conceptualization, K.A.; methodology, K.A.; software, K.A.; validation, Y.T.B.; formal analysis, K.A.; investigation, K.A.; resources, K.A.; data curation, Y.T.B.; writing—original draft preparation, K.A. and Y.T.B.; writing—review and editing, K.A. and Y.T.B.; visualization, K.A.; supervision, K.A.; project administration, K.A.; funding acquisition, K.A. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement: The data is accessible upon request to the author.

Conflicts of Interest: The authors disclose no conflicts of interest.

Funding: This research did not receive any external funding.

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