



PLANNING MALAYSIA:

Journal of the Malaysian Institute of Planners

VOLUME 20 ISSUE 3 (2022), Page 217 – 226

EXPLORING RISK PERCEPTION AND INTENTION TO IMPROVE THE AIR QUALITY

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Abstract

Numerous environmental issues, particularly those with higher risks, have steadily come to the forefront of the public's concerns in recent years with the increased awareness on environmental quality. For example, air pollution is one of the main causes of death worldwide and contributes to the rise in the risk of chronic diseases. In the Turkish city of Adana, air pollution has long been recognised as a serious environmental and health concern with well-documented negative consequences on human wellbeing. Although important, little is known about how the general public views the risk of air pollution. Thus, this paper focuses on risk perception and behavioural intention to air pollution. Adana city in southern Turkey was chosen as the study area. The results showed that socio-demographic factors and perceived risk of familiarity with air pollution are significant factors influencing Adana inhabitants' willingness to pay for bettering the air quality. Additionally, it implies that the authority might provide a significant contribution by creating strategies to lessen the effects of air pollution on people, particularly in cities where air pollution is a problem.

Keywords: Risk Perception, Behaviour Intention, Air Pollution

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INTRODUCTION

The air quality is declining nowadays due to the growth of industrialisation, the rise in the number of private vehicles, and the combustion of fossil fuels. Moreover, air quality has become a regional concern due to the nature of air pollution and the ease with which its sources can be dispersed inside a city and to a larger range of surrounding cities (Sahrir et al., 2019). Additionally, urban air pollution continues to pose a serious threat to millions of urban residents worldwide and is thought to be responsible for 4.2 million deaths yearly (World Health Organization (WHO), 2020). Since 97.2 per cent of Turkey's urban population is exposed to harmful particulate matter (PM₁₀), the country has one of Europe's highest rates of premature deaths (Health and Environment Alliance (HEAL), 2015). As a result, the PM₁₀ measurements in the centre of Adana city for the year 2018 have exceeded the air quality limit values for safeguarding human health and the ecosystem (Ministry of Environment and Urbanisation Turkey, 2018). Improving air quality is critical to developing sustainable cities because an increasing proportion of Turkey's population now lives in urban areas. Since sulfur dioxide (SO₂) and particles exceed national air quality requirements in some urban and industrial areas, ambient air pollution still threatens the human health (Büke & Köne, 2016; Zahari et al., 2016). A study by Sahrir et al. (2020) shows that most of the community in Adana cannot accept the risk posed by air pollution, since different people react to it differently, and some are more impacted than others.

Adana is one of the biggest cities in Turkey, located on the Cukurova Plain of the Mediterranean Region (refer Figure 1). Cukurova Region has experienced rapid urbanisation and industrialisation over the past four decades (Say et al., 2017). It is the most crowded city, with an urban population of 2.263.373 in 2021 and 2.258.718 in 2020, with a growth rate of 2.1% (Turkish Statistical Institute (TUİK), 2022). The reason for the population rate and massive population in Adana is rural-to-urban migration for sectoral employment opportunities and quality of life.

Moreover, their ability to control the risk of air pollution was average. Therefore, risk perception is crucial in a public health risk situation because it affects which hazards people care about and how they respond to them. Increasing exposure levels and personal risk perception may drive behavioural changes in risk response (Bergstra et al., 2018). However, research frequently concentrates on air pollution disparities between metropolitan or regional areas, risk perception of air pollution and adaptation strategies, but less often is research on the risk perception and behavioural intention in improving the air quality. In addition, most studies focus on the perception of risks associated with diseases, accidents, natural catastrophes, or harmful activities, but few studies consider air pollution-related risks. Therefore, it is important to recognise the behaviour intention to reduce air pollution and how people perceive the risk of air pollution.

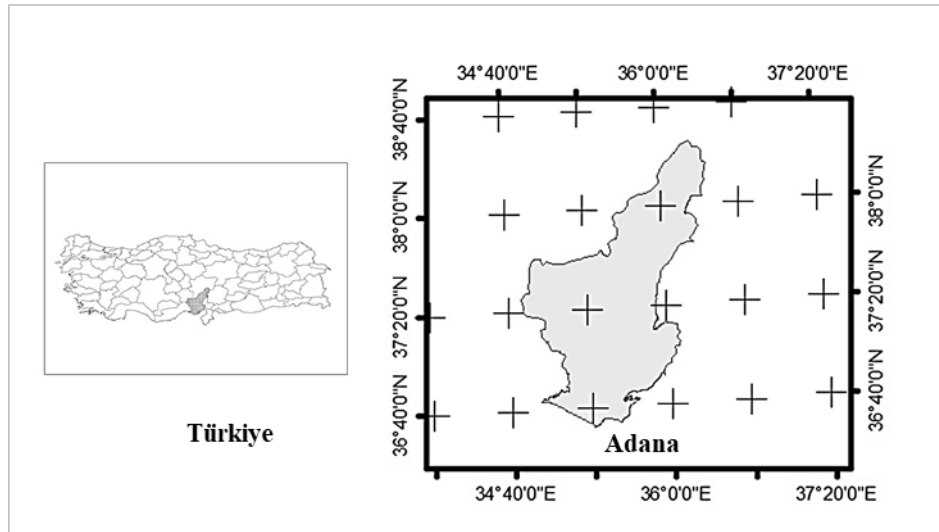


Figure 1: Location Map of Adana

LITERATURE REVIEW

Numerous epidemiological studies have established the detrimental effects of air pollution on human health, particularly on the cardiovascular, pulmonary, and respiratory systems (Chen et al., 2018; Wakamatsu et al., 2017). Accordingly, studies have shown that public reaction to environmental exposure is significantly influenced by research on risk perception. Risk perception is the quantitative assessment of risks' desired and present riskiness and intended control (Ban et al., 2019). Regarding various risks, it depends on the individual. However, it can be defined as particular aspects of air pollution that affect how it is perceived concerning the concept of perception and its social relationships (Oltra & Sala, 2014). According to Slovic (1987), seven perception elements can be used to categorise risks (such as those associated with air pollution and human health): knowledge, familiarity, concern, severity, dread, and acceptance. People and nature are interdependent; humans contaminate the environment, and the environment one lives in directly affects his or her health and wellbeing. Therefore, understanding and forecasting the effects of environmental contamination requires research on how people perceive health risks and air pollution.

Additionally, it has been discovered that the intention to reduce air pollution affects how people adapt and perceive risk. However, differences in perception between individuals and social groups may be explained by the attenuation of risk processes and social amplification (Oltra & Sala, 2014, 2018).

People's behavioural intention has attracted study due to the link between perceived risk and risk behaviour. This is because a basic problem in environmental economics and psychology has been how perceived risk affects people's behavioural intentions (Li & Hu, 2018). The theories and empirical investigations are in agreement with the significance of risk perception in illuminating people's risk-related behavioural intention.

Risk perceptions are established as significant predictors of behaviour and behavioural intentions in the social psychology literature on behavioural research (Ajzen, 1985). For example, a previous study by Li & Hu (2018) stated that more than 80% of those surveyed said they would use environmentally friendly transportation or pay an environmental tax to enhance Jinchuan's air quality. Evidence from this study also implies that lowering air pollution is a crucial political move to enhance the public's well-being. This also has been supported by Liu et al. (2021), indicating that risk perception can significantly influence consumer behaviour and intention to reduce the impact of air pollution. Furthermore, the findings show that socio-demographic characteristics, geographic location, self-reported experience, and health indicators all impacted the perceived risk of air pollution and their behaviour (Sahrir et al., 2020). Thus, the public's response, in turn, establishes the foundation for the public's involvement in risk mitigation. The findings of this study may help policymakers and other stakeholders concentrate on what is essential to reduce public environmental risks.

METHOD

This study aimed to examine the connection between risk perception towards air pollution and behavioural intention. Due to the characteristics of the target respondents in this study, cluster sampling is used. Respondents were selected for this study from regions that have been grouped into clusters based on geographical dispersion. A sample of 200 people between the ages of 18 and 65 who were stratified by age and gender in Adana took part in the questionnaire survey. Risk perception of air pollution was separated into seven aspects based on the psychometric paradigm approach by Slovic (1987) as an independent variable and behavioural intention as a dependent variable, as listed in Table 1. Socio-demographics were treated as potential factors impacting variables for each behavioural intention aspect. P-values were employed to quantify the notion of statistical significance of evidence, and a significance threshold of $p < .05$ was selected. The analysis of all the data was done with IBM SPSS Statistics.

Table 1: The parameters of the binary logistic regression model

	Models	Variables	Description
Dependent variables	Behaviour Intention	Environmental taxes Extra money (exclude tax)	Dichotomous variable (Yes = 1; No = 2)
Independent Variables	Risk Perception	Knowledge Familiarity Concern Severity Dread Controllability Acceptance	Continuous variables: Knowledge, familiarity, perceived concern, severity, dread, controllability, and acceptance of local air pollution are the that describe the risk perception of various components
	Age	18–25 26–35 36–50 51–65 ≥ 65	Categorical variable: 18–25 years old = 1; 26–35 years old = 2; 36–50 years old = 3; 51–65 years old = 4; over 65 years old = 5
	Educational Background	No schooling completed Primary school Secondary school Degree holder	Categorical variable: no schooling completed = 1, primary school = 2, secondary school = 3, bachelor’s degree = 4, master and above = 5
	Monthly household income	0-1500 TL 1500-2500 TL 2500-4000 TL 4000-5500 TL 5500 TL and above	Categorical variable: representing the annual income of the family 0–1500 TL = 1, 1500–2500 TL = 2, 4000–5500 TL = 3, ≥ 5500 TL = 4

RESULTS

About 50.5 per cent of the 200 respondents were male, and 49.5 per cent were female. The age range for 30.5 per cent was 36 to 50 years old. In addition, 47 per cent of respondents said they had completed or were currently completing their degree programmes, and 2% said they had not. As shown in Table 2, most respondents chose not to pay for tax and extra money to improve the air quality. This study concludes that the predictors of behavioural intention for air quality improvement were educational background and familiarity with risk (refer to Table 3). The residents unfamiliar with air pollution (coefficient = -0.637 , $p = .004$) deliberately considered paying environmental taxes to improve the air quality.

Table 2: Descriptive analysis

Percentage (%)	Yes	No
Would you like to pay environmental taxes?	49.5	50.5
Would you like to pay extra monthly money to improve the air quality in Adana?	49.0	51.0

Moreover, residents unfamiliar with air pollution (coefficient = $-.273$, $p = .005$) are willing to pay extra money to improve air quality. Hence, familiarity with air pollution strongly influences the behavioural intention to improve air pollution. Additionally, the educational background significantly influences the respondents in paying taxes (coefficient = $.772$, $p = .008$) and extra money (coefficient = $-.403$, $p = .029$) to improve air pollution in their area. This is consistent with the previous study as socio-demographics influence behaviour towards air pollution.

Table 3: Effects of multi-angle predictors on behaviour intention analysed by a binary logistic regression model

	Behaviour Intention	
	Tax	Extra Money
Knowledge	.161	-.140
Familiarity	-.637**	-.273*
Concern	-.288	-.018
Severity	-.035	-.067
Dread	-.389	.061
Controllability	.374	-.065
Acceptance	.127	.067
Age (years) 18–25	.358	-.077
Education background	.772**	-.403*
Monthly household income	.043	-.146
Cox & Snell R Square	.142	-.140
Nagelkerke R Square	.252	-.273

Significance levels: * $p < .05$, ** $p < .01$

DISCUSSION

Anthropogenic activities are the main causes of air pollution and global warming. The results of this study shed light on the mechanisms underlying people's desire to improve air quality by willing to pay to reduce the risk. This has the benefit of eliciting risk perceptions (thoughts and judgements) from those who are (possibly) exposed to specific dangers that are researched and can provide details on the causes of behaviour and potential influences on this. The findings show that the educational background was some factor that contributed to the intention to improve air quality. This is in line with a previous study by Ban et al. (2017),

which specified that greater education may impact the perception score, suggest a higher risk perception of local air pollution, and may increase the intention and willingness to pay for the environment. Additionally, education level has been proven to significantly impact respondents' perceptions and behaviour in various environmental research (Fu et al., 2019). Moreover, the previous study shows that young people's behaviour is essential to reducing air pollution (Kaushik, 2016), even though this study does not show the significant value of age towards the behaviour intention in improving air quality.

As mentioned by Bakar et al. (2020), environmental behaviour contains behaviours like interacting with the environment, carrying out duties or activities, demonstrating abilities and talents, and acting appropriately. Thus, the intention of this behaviour may be improved by focusing on risk perception, as this study found that familiarity with the risk may contribute to the behaviour. When the respondents are familiar with the pollution levels in their neighbourhood area, they tend to pay extra money to improve their air quality. Notwithstanding that this study has found that monthly household income does not significantly influence willingness to pay, research by Fu et al. (2019) says otherwise. Income has the greatest impact on behaviour intention to pay for improving air as wealthier people were willing to pay more for current air pollution and had greater pollution mitigation measures. A study by Bazrbachi et al. (2017) also stated that Higher-income respondents are more willing to pay to preserve their existing standard of living. This study found that most respondents are unwilling to pay due to improved air quality. This is in line with the study by Wang et al. (2016), as they discovered that people do, however, tend to believe that the government should have a larger role in smog control and prevention, as seen by the fact that they would rather pay for their protection than support such initiatives.

CONCLUSIONS

This study aimed to add knowledge on the impact of environmental risk on behavioural intention to improve air quality. To assess each variable, a binary logistic regression model was employed. The results of this study could help stakeholders and policymakers concentrate on what is essential to reduce environmental risk for the general public while increasing the intention to improve air quality. Public health practitioners can plan and manage community activities, policy needs, and communication strategies by understanding public perceptions of environmental risks, contaminants, and health impacts. Risk perception and socio-demographic variables all substantially impacted the behaviour intention with air pollution. Therefore, it is essential to constantly increase public understanding of the environmental health risks associated with air pollution, including the sources of exposure, types of impacts, and initial preventative measures. In addition, several strategies need to be implemented

other than just focusing on environmental tax in reducing and improving air quality.

Public policy is an important tactic for enhancing air quality and people's health related to air pollution. The findings might also give policymakers some understanding of how and why residents care about improving air pollution. In conclusion, the current research raises the possibility that integrated elements of risks may be responsible for behaviour intention during smog occurrences. Therefore, policymakers should employ several strategies to encourage individual action, such as enhancing each person's sense of air pollution and promoting adopting strategies to deal with it. In addition, future studies could investigate behaviour intention toward reducing the impact of air pollution and or by comparing behaviours may obtain more exciting findings. Finally, the knowledge presented in this research may help understand how the public perceives air pollution, particularly regarding public involvement.

ACKNOWLEDGEMENTS

This study is supported by Mevlana Exchange Programme.

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Received: 30th June 2022. Accepted: 12th September 2022