

# The Impact of Controlling Health Behavior on Awareness Levels to Limit the Spread of COVID-19

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**Abstract:** This study aimed to identify the impact of controlling health behavior on the level of awareness to limit COVID-19. A descriptive study was conducted on a sample of families of male and female students from a number of Saudi universities. The study used a questionnaire to collect data from 414 participants. The results showed that the participants had an elevated level of health awareness regarding methods and ways of preventing coronavirus, knowing the symptoms and how to transmit infection and ways of spreading the disease, in addition to knowing the procedures followed to isolate those infected. The participants also used a mixture of internal and external methods of health control. The study found statistically significant differences between the level of health awareness and controlling health behavior among respondents according to the study variables in favor of females, divorced, and those with a high economic level. The study recommends the importance of raising the level of health awareness through awareness, education, and training on controlling internal health behaviors.

**Keywords:** Controlling Health Behavior, Locus Control, Health Awareness, Health Behavior, COVID-19.

## 1 Introduction

The coronavirus outbreak that originated in China in late 2019 has evolved into a global pandemic of COVID-19, a severe respiratory disease that has inflicted enormous human and economic losses [1].

This pandemic has created a novel and uncertain social situation that challenges the ability to foresee its future course and consequences. In response to this crisis, countries have implemented various social policies to contain the virus, such as home isolation, school and institutional closures, partial or full lockdowns in countries like Russia, Italy, Saudi Arabia, Egypt, Qatar, Kuwait and others, suspension of public gatherings, compulsory health quarantine for uninfected people and shutting down some major cities that experienced a disastrous spread of the disease such as Wuhan. International travel was also disrupted as airports were closed and flights were temporarily canceled [2].

The World Health Organization recommended a number of preventive measures such as maintaining safe distances (at least two meters) from others outside the home, minimizing social interactions and avoiding crowded places in institutions, companies, or markets. Individuals also adopted preventive and disinfectant tools for their workplaces and reduced their occupational density by half [3]. These measures have resulted in a drastic reduction of most social, economic, and cultural activities, along with a shift in behavioral patterns and daily routines [2].

The COVID-19 pandemic has revealed the significance of social and cultural factors in influencing the diagnosis, treatment and prevention of diseases and their relation to health services. Therefore, this study aims to explore health behavior and control techniques and their impact on reducing the incidence of diseases and epidemics. This study adopts a comprehensive approach that combines the insights of social sciences that offer scientific and logical accounts of health behavior and its implications for individuals and society. Health control is a behavior that can be acquired and modified to influence individuals' level of health awareness. This study seeks to guide individuals to access health information by providing them with comprehensive and understandable information about the symptoms, transmission, and treatment of the disease, while addressing the actual health challenges and needs of society during the pandemic. This study also aims to change individuals' attitudes, behaviors and habits and motivate them to enhance their own, their families' and their communities' health. This would facilitate the implementation and success of preventive health initiatives in society during the pandemic by fostering cooperation with authorities and understanding the goals of health education programs that aim to raise individuals' awareness and change their behaviors, especially in the face of

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disease outbreaks. This enhances the implementation and effectiveness of preventive health initiatives in society during the pandemic period by collaborating with authorities and comprehending the goals of health education programs that aim to inform individuals and increase their awareness with the purpose of modifying their behavioral habits, especially in the situation of the outbreak of diseases and epidemics within society, and then this process results in establishing healthy behavioral habits [4].

### *1.1 Study Problem*

COVID-19 is a new respiratory disease caused by a novel coronavirus that first appeared in Wuhan, Hubei Province, China, in December 2019. The World Health Organization (WHO) identified and classified the disease as a coronavirus disease. The virus rapidly spread throughout the world in the first half of 2020, creating one of the biggest challenges for the global community. As of July 2020, WHO reported that the worldwide number of confirmed COVID-19 cases was 13,795,615, with 588,977 fatalities [5].

The World Health Organization (WHO) and the Ministry of Health in the Kingdom of Saudi Arabia have been monitoring and reporting the statistics of the novel coronavirus COVID-19 epidemic. The statistics indicate an increasing risk of infection with this new and poorly understood virus, as well as with other epidemic diseases. Therefore, various countries and health organizations have launched awareness programs to prevent the virus and reduce its transmission.

Hence, it is essential to promote health awareness, share scientific knowledge and best practices, and provide quality education on enhancing understanding of epidemics at various levels, from local to global, as these are effective strategies to prevent and combat epidemics, [www.un.org](http://www.un.org). However, we observe that taking advantage of awareness programs to regulate the health behaviors of individuals is a challenging process. It aims to modify behavior by influencing behaviors rather than merely providing information, since knowledge does not always result in behavior change. Health education and awareness imply improving behavior. It consists of a set of structured and designed experiences that enable the involuntary adoption of behaviors that improve the health of individuals, groups, and society.

This requires studying the healthy behaviors of individuals during the COVID-19 pandemic and knowing their level of health awareness and their ability to control their health behaviors. Health control is a learned behavior that affects individuals and changes their level of health awareness by educating them and raising their awareness for the purpose of changing their behavioral habits during the COVID-19 pandemic period. This contributes to instilling behavioral habits and correct health practices that reflect the role of solidarity responsibility in deepening community participation, spreading health awareness, and emphasizing the importance of everyone's cohesion—governments and individuals—to preserve the homelands and the health of citizens and confront this global epidemic. The problem of the current study is summarized in the following main question: What is the impact of controlling health behaviors on the level of awareness to limit COVID-19?

### *1.2 Study Importance:*

- The issues related to the COVID-19 pandemic are critical issues at the local, regional, and international levels that require study due to their impact on all segments of society in general.
- The study provides a theoretical framework for the accumulation of knowledge about the impact of controlling health behaviors on the level of awareness to limit COVID-19 by enriching the Arabic library with information about the level of health awareness and controlling health behaviors during the COVID-19 pandemic in Saudi society.
- Awareness programs contribute to creating a society whose members have acquired preventive health information about epidemic diseases in general and COVID-19 in particular by knowing the rates of infection, causes and methods of transmission of the disease, symptoms, and methods of prevention. This contributes to creating a society whose members realize that solving their health problems and maintaining their health and the health of their society is their responsibility (internal control) before it is the responsibility of government agencies (external control).
- The results of the study benefit decision-makers by enabling them to know the best methods suitable for planning awareness and health education programs about epidemic diseases in general and COVID-19 in particular, which enables them to formulate strategies that contribute to addressing them.

### *1.3 Study objectives:*

The study aims to identify the impact of controlling health behavior on awareness levels to limit COVID-19.

#### 1.4 Study questions:

The study aims to answer the following questions:

1. What are the social, economic, and demographic characteristics of the sample?
2. What is the level of health awareness among the sample about COVID-19?
3. What are the sources of health information for the sample about COVID-19?
4. What are the methods of controlling health behavior among the sample?
5. Is there a relationship between the level of health awareness and controlling health behavior among sample?
6. Are there statistically significant differences in the level of health awareness and controlling health behavior among the sample according to age, gender, marital status, educational level, and economic status?

#### 1.5 Study Terms:

- **Health Awareness:** the extent of individuals' knowledge about the importance of avoiding hazards and means that threaten health and protecting them from all diseases that may affect humans. Health awareness gives the individual the health facts that affect his habits [6]. It also means the familiarity of members of society with health information and facts and their sense of responsibility towards their health and the health of others through intentional healthy practices as a result of understanding and conviction to turn those practices into habits that are practiced unconsciously or without thinking [7].
- **Locus Control:** It is the degree of an individual's belief in the factors controlling their health, which includes either internal factors that are specific to the individual or external factors that are attributed to influential people such as doctors and others or to luck [8].
- **COVID-19:** It is an acute respiratory syndrome of the second generation of SARS-COV-2 and was discovered by analyzing the DNA of patients with unknown pneumonia in the Chinese city of Wuhan. Infection results in the appearance of respiratory and digestive symptoms. The sources and methods of infection vary in actual patients, asymptomatic patients, or through sneezing and hand contact [1]. There are categories that may be more susceptible to infection, such as the elderly and patients with chronic diseases [3].

## 2 Literature Reviews

Health awareness is the extent of people's awareness of health methods and rules in order to maintain their safety from various diseases and epidemics that have swept the world over the years. This is achieved through their learning how to deal with diseases and avoid infection, as well as possessing information about these epidemics by knowing their methods and speed of spread and how to limit the spread of infection. In this way, healthy habits are acquired, and previous unhealthy habits are avoided.

COVID-19 is considered one of the most dangerous viruses that has swept the world; it was classified as a global pandemic by the World Health Organization due to its rapid spread among humans in various countries around the world. Saudi Arabia is no exception and has not been spared from this dangerous epidemic. After a few months of recording the first case, a state of emergency was declared in the country, and the state implemented many precautionary measures aimed at protecting citizens from this virus, containing it, and trying to limit its spread by imposing social distancing, wearing masks, quarantine, preventing gatherings, and so on.

It is perhaps necessary and important to implement health awareness programs when diseases and epidemics spread among individuals as one of the important precautionary measures that should be developed among individuals in order to maintain their health and the health of others, protect them from various diseases, and achieve comprehensive health growth. Health awareness is an important and effective means based on scientific and practical foundations, and it has an important role in improving the level of public health among members of society by providing them with information that is appropriate for their level of thinking so that they become able to understand the nature of healthy conditions that are beneficial to them and cooperate with what is happening around them in terms of health matters [9].

Health awareness is formed through a set of knowledge and beliefs that individuals have about health issues, problems, and diseases. As with chronic health problems such as smoking, addiction, sexually transmitted diseases, and obesity, combating them depends on changing the lifestyle patterns and behavioral habits of individuals in specific areas by knowing the factors and causes that lead to these health problems.

Health awareness has several areas represented: personal health awareness, nutritional health awareness, and

environmental health awareness. It is important to focus on areas of personal health awareness for individuals to promote health knowledge by knowing the importance of health, cleanliness, nutrition, sleep, rest, and practicing recreational activities in leisure time. The process of awareness and guidance to maintain health is the duty of every capable person in society [10].

However, health knowledge does not mean commitment to applying the acquired knowledge to control healthy behavior. The concept of locus of control is relatively modern, and the first credit for the emergence and highlighting of the concept of locus of control goes to Julian Rotter [11] when formulating the theory of social learning in the mid-fifties. The concept refers to how individuals perceive their ability to control the outcomes associated with their behavior, and thus they are divided into two types of individuals: those with an internal locus of control who believe in their ability to self-control and influence events and control them, and individuals with an external locus of control who believe that the process of controlling the outcomes associated with their behavior is subject to external forces and factors such as luck and the influence of power holders [12].

Locus of control is one of the dimensions of personality and affects many types of behavior. The individual's belief that he can control his private and public lives allows him to adapt and helps him harmonize with the environment in which he lives [13]. The locus of control is considered one of the variables that are important in influencing mental health, and the external dimension of the locus of control is associated with both nervousness, anxiety, and negativity in social interaction. While the level of psychosocial harmony increases as the locus of control is internal [14]. There are a number of studies that have confirmed the importance of the internal (health) locus of control in achieving human psychosocial harmony and have shown through them that the relationship between poor psychosocial harmony and social avoidance, low social self-esteem, and social anxiety and depression negatively correlates with an internal (health) locus of control [15].

The health control theory contributes to clarifying the relationship between health, behavior, prevention, and dealing with disease. It indicates that there is a functional relationship between practicing health-related behaviors and the internal health control center that helps raise the level of readiness and desire to practice preventive health behaviors, unlike the external control center [16]. The internal control center not only directs preventive health behavior but also activates the coping style or way of dealing with the disease situation [17] [18]. Therefore, the control center should be considered one connected entity with two sides: internal and external control. Individuals fall on points and positions between them, resulting in a few of them having a high and relatively constant internal or external orientation [19].

## 2.1 Previous Studies

Previous studies are one of the most important references that the researcher refers to, as they enrich the theoretical heritage of the study. We will present previous studies that addressed the subject of the study, and they will be divided according to the study's axes and then commented on.

- First :Studies addressed the relationship between control and health behavior:

Here we review studies that addressed the relationship between control and health behavior and linked them to a number of social and economic variables for researchers. Among these studies is one [20] aimed at identifying the relationship between control orientation and health behavior among a sample of adults in Latakia city. The results of the study confirmed the absence of a statistically significant relationship between control orientation and health behavior in the studied sample. The study also showed that individuals in the research sample tended toward positive health behaviors and internal control. It also found statistically significant differences in health behavior among sample individuals according to gender in favor of females and no statistically significant differences in control orientation according to social status.

- Secondly :studies that addressed the level of health awareness:

Regarding studies that addressed the level of health awareness, a study [24] aimed at identifying the level of health awareness and determining the differences in the level of health awareness among University of M'sila students according to gender and specialization. The results showed that the level of health awareness was high. A study [25] found an increase in the level of health awareness and pointed out the positive role of social media sites in promoting health awareness among participants. These results are consistent with a study [26] which aimed to identify the level of health awareness about infectious diseases in light of the COVID-19 pandemic among primary school students. The research results indicated that there is a general level of health awareness among participants and recommended enhancing awareness to acquire healthy habits related to disease prevention in general and infectious diseases in particular.

- Thirdly :studies on sources of obtaining health information during the COVID-19 pandemic:

The study [27] on obtaining preventive health information during the Corona pandemic found that the researchers relied on mobile phone applications to obtain information and news. The study [28] found that there is a follow-up to the Corona pandemic on social media sites in order to identify the necessary prevention methods. The study [29] aimed at identifying the relationship between the extent of reliance on mobile phones and the level of awareness acquired about the Corona virus. The results showed that young people rely on social media sites as a source for obtaining health information. The study [30] confirms the Saudi public's reliance on social media sites to learn about developments in the Corona pandemic crisis. These results are consistent with the study [31] that confirms the positive role of social media sites in obtaining information and news about the Corona virus.

- Fourthly :studies that addressed risk perception and methods for controlling health behavior:

There are several studies, including [32] that determined the level of awareness, symptoms, and prevention of COVID-19. The study found that participants follow health information related to the Corona pandemic from reliable media sources and have knowledge of the disease's spread methods and preventive measures, including maintaining social distancing and wearing masks, in addition to adhering to other preventive measures. The study [33] aimed at determining the level of general risk perception caused by the Corona virus. According to the study's results, the absence of public health risk perception is more prevalent among people with low educational levels. It also became clear that people who were educated about COVID-19 had different health practices than those who were not educated about the pandemic. The study [34] found that isolation and social distancing can reduce virus transmission, but there is an urgent need for effective interventions to increase compliance with behaviors that protect individuals. Compliance with preventive behavior is a fundamental factor in preventing infection in the absence of drug interventions.

The study [35] found that most people hesitate to expose others to risk for their own benefit. Positive social individuals mostly follow preventive measures. The study indicates that the impact of policies on community members depends on their degree of social support. The study [36] surveyed the opinions of social media users during the Corona pandemic. The results showed that people used social media to reach out to others for emotional support, whether virtually or in the real world. The study [37] aimed to identify the relationship between risk perception of the Corona pandemic and adherence to preventive measures announced by the Ministry of Health. The study found that there is a positive correlation between risk perception of the Corona virus and adherence to preventive health measures in the study sample.

- Commenting on previous studies:

The majority of the literature focused on health awareness or health control. The current study is distinguished from previous studies in that it combines research on the health knowledge of the respondents by identifying the group of information, experiences, and cumulative health perceptions and the sources of their access to that information. This is an important factor in disease prevention and a source of improving health, and the extent to which they benefit from it by translating it into healthy behaviors to maintain their safety, community safety, and protection from the risk of COVID-19 infection. The current study agrees with previous studies in the nature of the methodology used, which is descriptive methodology, and the tool used to collect data and information, which is the questionnaire. It also agrees with some previous studies on the sample used to apply the questionnaire to university students. The current study has benefited from previous studies in its results and recommendations, including writing the theoretical framework for research, identifying methodology, building research tools, discussing results, and benefiting from references, books, studies, and scientific journals to enrich the study.

### 3 Methods

This study is an analytical descriptive study that provides information and facts about the current phenomenon and also clarifies the relationship between different phenomena and the relationship between the same phenomena. It also helps predict the future of the same phenomenon. The research relied on quantitative expression (a questionnaire) in collecting data and describing it numerically, which shows the amount or size of this phenomenon, and then reaching results and drawing conclusions, generalizations, and new relationships [38]. The study aims to identify the effect of controlling health behavior on health awareness levels to limit COVID-19. Previous literature on the subject was reviewed, followed by data collection, statistical processing, analysis of results, and interpretation.

#### 3.1 The research methodology:

The current research relied on the social survey method as one of the main methods used in descriptive-analytical studies. It is characterized by its ability to obtain the largest amount of data and information within the limits of time, effort, and available resources for researchers. Therefore, it contributes to obtaining the necessary quantitative data to understand reality and answer questions. It helps in description and does not suffice with describing data but seeks to analyze it and reach generalizable conclusions [39].

### 3.2 The research community:

The research community consists of a random sample of families of male and female university students in several major cities in the Kingdom of Saudi Arabia.

### 3.3 The research sample:

The research utilized a random sample of families of male and female university students specified in the study, which are: Princess Noura bint Abdulrahman University, King Saud University, King Abdulaziz University, and King Faisal University female university students specified in the study, which are: Princess Noura bint Abdulrahman University, King Saud University, King Abdulaziz University, and King Faisal University. The total sample size was 414 individuals. Data was collected using a questionnaire, and reliability and validity tests were conducted. The study was conducted during the years 2020–2021.

### 3.4 Research tools preparation:

The questionnaire was prepared in its initial form after reviewing the literature, studies, and previous research related to the research topic, as well as surveying the opinion of a sample of specialists through personal interviews and benefiting from them in determining the axes of the questionnaire, as well as in formulating sub-graduated phrases from the principal areas.

## 4 Results

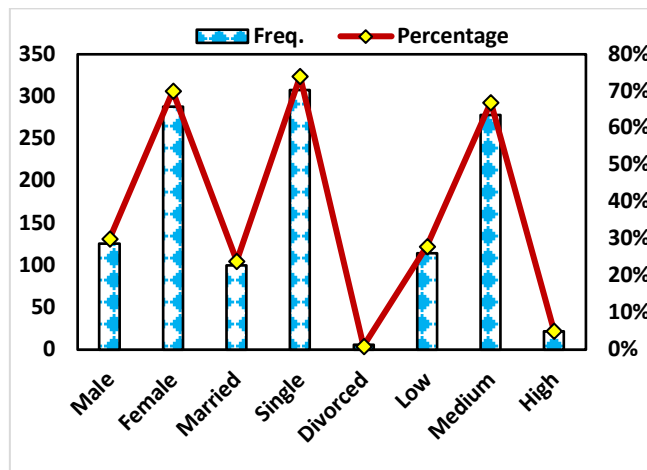
The reliability test was conducted using Cronbach's alpha at a degree of reliability of 95%. The reliability percentage was 80.5%, indicating the validity of the 414 responses for statistical analysis on the twenty-six questions included in three main axes.

The first question: What are the socio-economic and demographic characteristics of the participants?

**Table 1:** Distribution of research sample according to some demographic variables (no. 414)

Variable	Sub-groups	Freq.	%
Gender	Male	126	30%
	Female	288	70%
Marital Status	Married	100	24%
	Single	308	74%
	Divorced	6	1%
Income level	Low	114	28%
	Medium	278	67%
	High	22	5%

According to the table (1), most of the sample participants are “female” 70%, regarding the marital status, most of the sample were “single” 74%, in addition to most of the sample were middle-income earners 67%. These data are also represented by the following Figure 1.



**Fig. 1:** Frequency vs. Percentages alongside sub-groups

The second question: What is the health awareness level of participants?

**Table 2:** The results of the frequencies and the arithmetic means of the responses of the sample participants.

#	Item	Agree		Neutral		Disagree		Mean	Rank
		Freq.	%	Freq.	%	Freq.	%		
1	I Know prevention corona virus methods	392	95%	18	4%	4	1%	2.94	1
2	I know how the Corona virus is spreading	360	87%	50	12%	4	1%	2.86	2
3	I have knowledge of the Corona virus infection symptoms	352	85%	32	8%	30	7%	2.78	4
4	I know the procedures of isolating people who infected by Coronavirus	362	87%	42	10%	10	2%	2.85	3
All axis								2.86	

The first axis: (the level of health awareness among the participants)

It is evident from the previous table that there is a statistically significant difference between the frequency of the participant's responses in favor of the response (agree) on all statements of the first axis related to (the participant's health awareness level). So, it was clear that the average for the phrase "Know ways to prevent Coronavirus" was the highest at 2.94, while the lowest average for this axis was 2.78 for the phrase "I know symptoms of Coronavirus infection," and the average for the whole axis was 2.86. It shows that the people in the study sample are deeply knowledgeable and have a high level of health awareness about how to avoid getting Coronavirus, how it spreads, the signs of infection, and how to isolate someone who has it.

The third question: What are the sources of health information about Covid 19?

**Table 3:** The second axis: (sources of health information about COVID-19)

#	Item	Agree		Neutral		Disagree		Mean	Rank
		Freq.	%	Freq.	%	Freq.	%		
1	Official websites of the Ministry of Health or WHO	370	89%	22	5%	22	5%	2.84	1
2	Social media	294	71%	40	10%	80	19%	2.52	2
3	Others such as (friends and family) etc.	248	60%	66	16%	100	24%	2.36	3
All Axis								2.75	

Confidence level (95%), statistically significant at (0.05) level

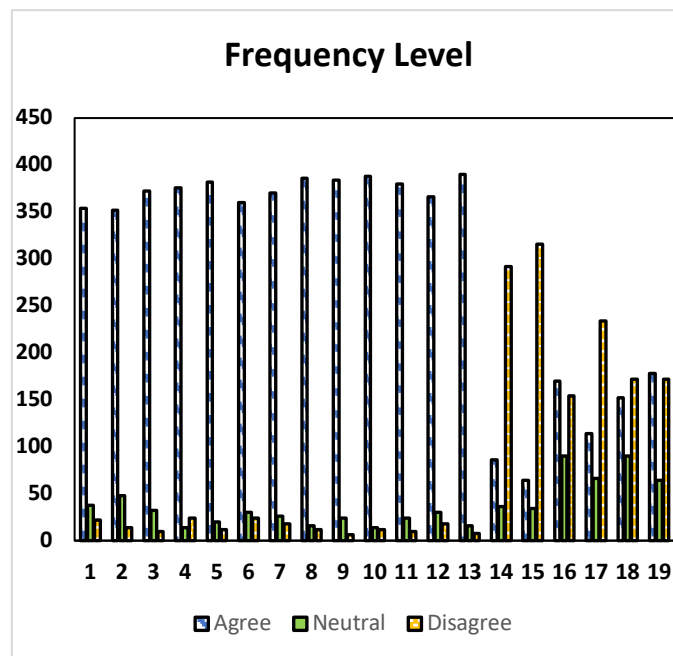
It is evident from the previous table that there are statistically significant differences between the frequency of the responses of the participants in favor of the response (agree) on all statements of the second axis related to (sources of health information about Covid 19). Whereas the phrase "official websites of the Ministry of Health or the World Health Organization" had the highest average of phrases (2.52), the phrase "other such as (friends and family)" had the lowest average of phrases (2.36), and the average for the whole axis was 2.57, which shows that the study sample agrees with the sources of health information in general. Figures 2, 3 and 4 represent frequency levels from sample participants, percentage levels from sample participants, and mean vs. rank considering the sample dataset, respectively.

The fourth question: What are the methods of controlling health behavior?

**Table 4:** The results of the frequencies and the arithmetic means of the responses of the sample participants.

#	Item	Agree		Neutral		Disagree		Mean	Rank
		Freq	%	Freq	%	Freq	%		
1	Commitment to the application of social distancing between me and others	354	86%	38	9%	22	5%	2.8	13
2	You can catch Covid-19 infection from a person without symptoms of the disease	352	85%	48	12%	14	3%	2.82	11
3	Seek medical care if I have symptoms of coronavirus	372	90%	32	8%	10	2%	2.87	7
4	I communicate with my friends and relatives through social media	376	91%	14	3%	24	6%	2.85	8
5	I wear a muzzle when I get out of the house	382	92%	20	5%	12	3%	2.89	5
6	Wash my hands often and use soap and water or an alcohol solution to sterilize the hands	360	87%	30	7%	24	6%	2.81	12

7	Make sure to cover my nose and mouth with my elbows or a tissue when coughing or sneezing	370	89%	26	6%	18	4%	2.85	8
8	Masks help prevent transmission of the virus from the person who wears the muzzle to others	386	93%	16	4%	12	3%	2.9	4
9	The goal of self-isolation is to prevent spreading infection to others	384	93%	24	6%	6	1%	2.91	2
10	The virus spreads through direct contact with an infected person or touching an infected surface and then touching the mouth, nose, or eyes	388	94%	14	3%	12	3%	2.91	3
11	Ban means restricting activities and isolating people who are not sick, with the aim of preventing the spread of disease	380	92%	24	6%	10	2%	2.89	5
12	I dispose of the used muzzle immediately by throwing it in a closed trash bin	366	88%	30	7%	18	4%	2.84	10
13	Know the groups most vulnerable to infection with Coronavirus, such as the elderly and those with chronic diseases	390	94%	16	4%	8	2%	2.92	1
14	Use the muzzle more than once to save money *	86	21%	36	9%	292	71%	2.5	15
15	Going out with friends and relatives is more important than adhering to the precautionary measures *	64	15%	34	8%	316	76%	2.61	14
16	Purchasing sterilizers and masks is expensive *	170	41%	90	22%	154	37%	1.96	19
17	Staying home for fear of catching the virus interferes with my religious practices *	114	28%	66	16%	234	57%	2.29	16
18	Use popular prescriptions and medicines to prevent infection with Corona virus *	152	37%	90	22%	172	42%	2.05	17
19	Adhere to preventive measures for fear of financial penalties *	178	43%	64	15%	172	42%	1.99	18
All Axis								2.67	



**Fig. 2:** Frequency levels from sample participants



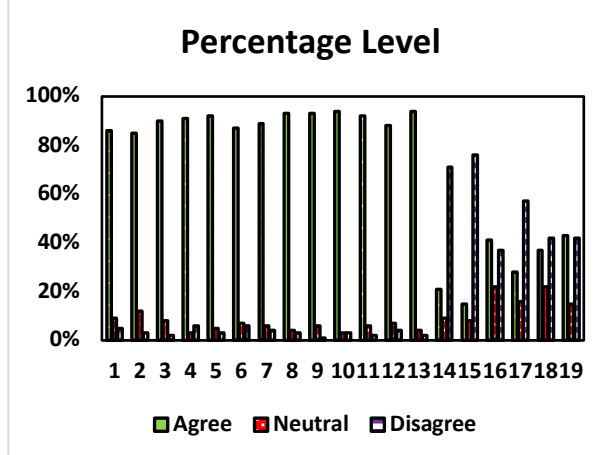


Fig. 3: Percentage levels from sample participants

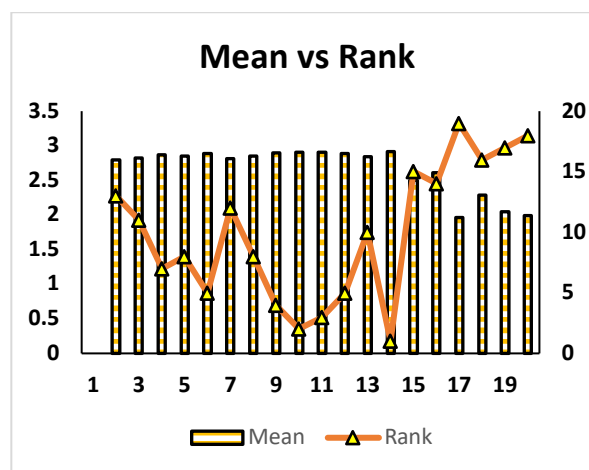


Fig. 4: Mean vs Rank considering sample dataset.

The third axis: (methods of controlling healthy behavior).

The level of confidence (95%) was statistically significant at the level (0.05) \* counter-questions whose values were reflected in the statistical analysis. From the last table, it is clear that there is a statistically significant difference between the number of times participants said "agree" to all of the statements on the third axis about (Methods of controlling healthy behavior) It was in favor of the answer for all but the last four questions (neutral). That is, the total study sample agrees, in statistical terms, with most methods of controlling healthy behavior. The highest average of the phrases of the axis was the phrase (Know the groups most vulnerable to infection with Coronaviruses, such as the elderly and those with chronic diseases, with an average of (2.92 out of 3), while the lowest average for the phrases of this axis It reached (1.96 out of 3) and the phrase (buying sterilizers and masks is financially costly), which is an average within the range of response (neutral), and the overall average for the axis reached (2.67), which indicates that the study sample generally agrees with methods of controlling healthy behavior to reduce COVID 19.

The Fifth question: Is there a relationship between the level of health awareness and controlling the healthy behavior of the participants?

**Table 5:** Results of the correlation analysis between the level of health awareness and controlling the healthy behavior of the participants (414)

	<i>Level of health awareness</i>	<i>Control health behavior</i>
<i>Level of health awareness</i>	1	
<i>Control health behavior</i>	0.462776	1

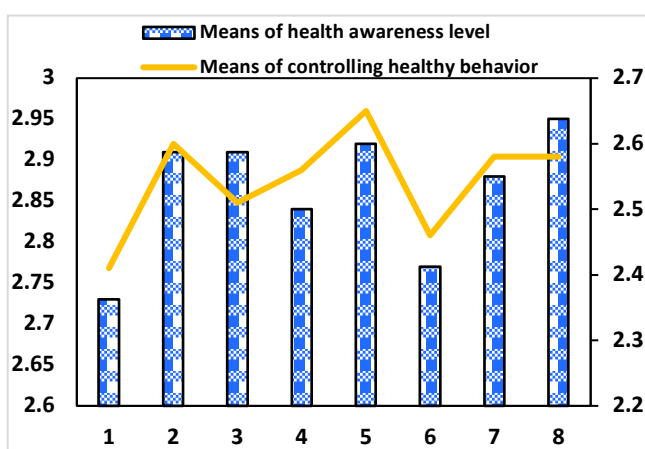
The correlation analysis shows a statistically significant correlation between the participants' level of health awareness and the control of healthy behavior, indicating that those with a greater level of health awareness discipline healthy behavior at a higher level. Both cognitive behavior and the changes in terms of surroundings are important to meet up this study. To find out the effect of demographic characteristics on the results of the analysis of the association between

the level of health awareness and controlling healthy behavior, the arithmetic averages of the first two axes entitled (the level of health awareness among the participants) and the third axis (methods of controlling health behavior) were assessed, and the results are as follows:

The sixth question: Are there statistically significant differences between the level of health awareness and controlling healthy behavior among the participants according to the variable of sex, marital status, and economic level?

**Table 6:** The effect of demographic characteristics on the results of the correlation analysis between the level of health awareness and controlling the healthy behavior of the participants (n = 414)

Variable	Subgroup	Means of health awareness level	Means of controlling healthy behavior
Gender	Male	2.73	2.41
	Female	2.91	2.6
Marital status	Married	2.91	2.51
	Single	2.84	2.56
	Divorced	2.92	2.65
Income level	Low	2.77	2.46
	Medium	2.88	2.58
	High	2.95	2.58



**Fig. 5:** The effect between the level of health awareness and controlling the healthy behavior.

The previous table shows a gender impact since there are statistically significant variations in the level of health awareness and managing healthy behavior among participants based on gender. Women are more disciplined in their health behavior than males because they are more conscious of COVID-19 health awareness compared to men. In terms of the influence of marital status, it was discovered that there are statistically significant variations in the level of health awareness and managing healthy behavior among participants based on a marital status variable. Participants with the marital status "divorced" are more conscious than those with the marital status "single" or "married," and they are also more disciplined in their health behavior.

Regarding the economic level, there is a statistically significant difference between the level of health awareness and management of healthy behavior among participants based on the economic level variable. Participants with a "high" economic level are more conscious than those with a "low" or "medium" economic level, although both "high" and "middle" income levels have equivalent degrees of discipline in their health behavior. Different parameters made the study more understanding and viable to all the sources readers. Also, the investigation considers more likely behavioral effects than the perspective one. So, every parameter is important in terms of the goodness of the dataset.

## 5 Discussions

The study found that participants have an elevated level of health awareness regarding methods and ways to prevent the spread of the coronavirus, knowledge of symptoms and how the infection is transmitted, as well as knowledge of the procedures followed to isolate infected people. This may be due to the participants' benefit from awareness programs and information published by the Ministry of Health in Saudi Arabia and the World Health Organization on media outlets and social media platforms. This has positively reflected on the participants' health knowledge and their benefit from it. As for controlling methods, it was found that most participants rely on internal control methods, while they were neutral about external control methods.

The study results showed that the participants rely on the official websites of the World Health Organization and the Saudi Ministry of Health for health information about COVID-19. This was followed by a reliance on TV news, seminars, and conferences during the pandemic period. The lowest percentage of participants relied on information provided by their parents, friends, and neighbors. This indicates the elevated level of awareness among the participants and their reliance on official channels to obtain information about the COVID-19 pandemic.

The study results found a statistically significant positive relationship between the participants' level of health awareness and their level of control over their health behaviors. This confirms that people with higher levels of health awareness have an elevated level of discipline in their health behaviors, meaning that increased awareness has a positive impact on the level of healthy behaviors.

The study results showed that there are statistically significant differences between the level of health awareness and the level of controlling health behavior among the participants regarding COVID-19. The study found that there are statistically significant differences between the level of health awareness and the level of controlling health behavior among the participants according to gender, with females being more aware compared to males. Therefore, they are more disciplined in their health behaviors compared to males.

Regarding the relationship between the level of health awareness and the level of controlling health behavior among the participants regarding COVID-19 and its relationship with a social status variable, the study found statistically significant differences according to social status in favor of participants who are "divorced" and who are more aware and more disciplined in their health behaviors compared to other social categories such as single and married.

As for the relationship between the level of health awareness and the level of controlling health behavior among the participants regarding COVID-19 and its relationship with an economic status variable, statistically significant differences were found in favor of participants with high economic status. The results showed that they are more aware compared to other participants with low and medium economic levels. However, both respondents with "high" and "medium" income levels have equal levels of discipline in their health behaviors.

## 6 Conclusions

This study highlights the importance of increasing health awareness through education and training on internal health behavior management. This will help to transform health information into behavioral practices that promote and contribute to healthy development. Controlling health behavior is a learned behavior that can affect individuals and their level of health awareness. This can be achieved by teaching and enhancing positive health habits that will support and develop health through school curricula, family, and all available means.

Finally, the researcher recommends conducting more comparative scientific studies at the international level to understand the relationship between degrees of awareness and controlling healthy behavior among community members. This will also help to analyze the internal and environmental factors that affect adherence to health behaviors.

## 7 Recommendations

The researchers through the results of the study reached the following set of recommendations:

1. The study found an increase in the level of health awareness among the participants during the COVID-19 pandemic period. This may be due to the intensity of awareness and health education programs during the pandemic period and the use of technological advancements in various media and different social media platforms to spread awareness among members of society. Also, individuals' fear of the pandemic and their lack of information about it led them to follow up on everything related to the pandemic, which led to an increase in the level of health awareness among participants. To maintain an elevated level of awareness, it is necessary to prepare effective, organized, and continuous awareness campaigns to promote the advancement of health awareness by disseminating and implementing measures and procedures that help limit the spread of infectious diseases and epidemics in general so that preventive health behaviors become part of our daily habits.
2. Benefit from technological and technical development and train workers in the field of health awareness and education on the optimal use of technologies in applications and social media platforms that help them accomplish their work with accuracy and professionalism, leading to achieving goals and disseminating preventive health information. In addition, developing digital awareness among beneficiaries to achieve the greatest possible benefit for the success of awareness programs.
3. The elevated level of health awareness among participants can be utilized to spread and acquire healthy habits related to personal health, healthy nutrition, and resistance to diseases in general and infectious diseases in particular.

4. There is a relationship between practicing health-related behaviors and the individual's internal health control center, which contributes to raising their level of readiness and desire to practice preventive health behaviors. This is in contrast to individuals who rely on external health control centers. The internal control center contributes to directing preventive health behaviors and activating the coping style for dealing with the disease. This means that the individual's adopted destination of control makes them aware of the behavior and its consequences. This requires attention to raising the level of health awareness through training on internal health control sources and upgrading health education in curricula.
5. Despite talking about external and internal control sources, we find another type of control that includes a mixture of internal and external types. People who possess this mixture of control centers are often known as dual-center individuals. These people who have this mixture of control centers can bear personal responsibility for their actions as well as their consequences, which is clearly evident in the study sample.
6. Controlling health behavior is a learned behavior. This means the importance of educating individuals on positive health behaviors and raising their awareness to change their behavioral habits, especially in the event of the spread of diseases and epidemics within the community. This requires teaching and instilling positive health habits that support the health aspect through curricula and other community institutions, utilizing all available means to achieve the desired goals.
7. Focus on allocating preventive health education programs for students at different educational levels in cooperation between the Ministries of Education and Health, focusing on clarifying the concepts of infectious diseases, how they spread, how to resist them, and how to avoid infection.
8. Implementing educational awareness programs about diseases and epidemics in general and about the COVID-19 pandemic in particular through lectures, scientific conferences, and specialized training courses contributes to raising the level of health awareness among members of society.
9. Conducting more comparative scientific studies at the international and regional levels to understand the relationship between various levels of awareness and controlling health behavior among different communities, in addition to analyzing internal and environmental factors that affect individuals' commitment to healthy behaviors.

## Conflicts of Interest Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Ethics Statement

**Institutional Review Board Statement:** IRB Registration Number with KACST, KSA: H-01-R-059 Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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## References

- [1] Olivera-La Rosa, A., Chuquichambi, E. G., & Ingram, G. P. (2020). *Keep your (social) distance: Pathogen concerns and social perception in the time of COVID-19*. *Personality and Individual Differences*, 166, 110200.
- [2] Chen, H., Xu, W., Paris, C., Reeson, A., & Li, X. (2020). *Social distance and SARS memory: impact on the public awareness of 2019 novel coronavirus (COVID-19) outbreak*. medRxiv.688.
- [3] Sun, C., & Zhai, Z. (2020). *The efficacy of social distance and ventilation effectiveness in preventing COVID-19 transmission*. *Sustainable Cities and Society*, 62, 102390. <https://doi.org/10.1016/j.scs.2020.102390>
- [4] Al-Zouq, M. (2017). *The role of social media in enhancing political participation: A case study of Jordan*. In M. Khosrow-Pour (Ed.), *Encyclopedia of information science and technology* (4th ed., pp. 89-99). IGI Global. <https://doi.org/10.4018/978-1-5225-2255-3.ch008>
- [5] World Health Organization. (2020). Advice for the public: Coronavirus disease (COVID-19). Retrieved from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

- [6] Malmhem, A. (2019). *The mitophagy activator urolithin A is safe and induces a molecular signature of improved mitochondrial and cellular health in humans*. *Nature Metabolism*, 1(6), 603-603. <https://doi.org/10.1038/s42255-019-0073-4>
- [7] Badh, A., Akyuz, A., Vocke, G., & Badh, A. (2009). *Impact of climate change on the growing seasons in select cities of North Dakota*, United States of America. *Journal of Environmental Science and Engineering*, 3(10), 15-22.
- [8] Rotter, J.B. (1966). *Generalized expectancies for internal versus external control of reinforcement*. *Psychological Monographs: General and Applied*, 80(1), 1-28.
- [9] Whitehead, M. (2001). *Health Promotion in Practice: Models, Methods, and Settings*. McGraw-Hill Education.
- [10] Abdulaziz, A. (2020). *The Impact of Locus of Control on Health Behaviors: A Review of the Literature*. *Journal of Health Psychology*, 25(11), 1511-1522. doi:10.1177/1359105320936987.
- [11] Rotter, J. B. (1966). *Generalized expectancies for internal versus external control of reinforcement*. *Psychological Monographs: General and Applied*, 80(1), 1-28. doi:10.1037/h0092979
- [12] Rotter, J. B. (1990). *Internal versus external control of reinforcement: A review and examination of some conceptual issues*. *Psychological Bulletin*, 108(1), 39-64. doi:10.1037/0033-2909.108.1.39
- [13] Bar-On, R. (2006). *The Bar-On Model of Emotional Subjective Well-Being*. *Perspectives in Education*. 23 (2). 41 - 62.
- [14] Qinan, Iman and Ben Taher, Bashir (2022). *The nature of the health control center: A critical analytical study*. *Rawafid Journal for Scientific Studies and Research in Social and Human Sciences*, Vol. 6, No. 2, pp. 261-282. Retrieved from <http://search.mandumah.com/Record/1291286>.
- [15] Meijer, S. A., Sinnema, G., Bijstra, J. O., Verhagen, A. P., & Verdonk, R. (2002). *Coping styles and locus of control as predictors for psychological adjustment of adolescents with cancer*. *Health & Social Work*, 27(4), 245-256. doi:10.1093/hsw/27.4.245
- [16] Rotter, J.B. (1990). *Some problems and misconceptions related to the construct of internal versus external control of reinforcement*. *Journal of Consulting and Clinical Psychology*. 43: 56-67.
- [17] HiMarks, M. (1986). *The relationship between locus of control and health-promoting behaviors*. *Nursing Research*, 35(5), 251-255. doi:10.1097/00006199-198609000-00003
- [18] Marks L& Holtenhof., (2000). *Deconstructing locus of control implications practitioners*. *Journal of counseling and development* 76. (3), pp.251-260.
- [19] Hjell, J. L., & Ziegler, D. J. (1992). *Locus of control and health-promoting behaviors in Norwegian adolescents*. *Journal of Applied Social Psychology*, 22(11), 941-953. doi:10.1111/j.1559-1816.1992.tb00988.x.
- [20] Sharabiya, Bushra and others. (2016). *The relationship between attitude adjustment and healthy behavior (a field study on a sample of adults in Latakia city)*. Tishreen University, *Journal of Humanities and Social Sciences*. Volume 38 Issue 6. 269-485. <http://journal.tishreen.edu.sy/index.php/humlitr/article/view/2414>.
- [21] Abdulhak, S., Al-Sharif, A., & Al-Dossary, A. (2012). *The relationship between locus of control and health-promoting behaviors among Saudi university students*. *International Journal of Environmental Research and Public Health*, 9(9), 3607-3619. doi:10.3390/ijerph9093607.
- [22] Khalafi, M. (2015). *The relationship between locus of control and health-promoting behaviors among Jordanian university students*. *International Journal of Academic Research in Business and Social Sciences*, 5(12), 283-290. doi:10.6007/ijarbss/v5i12/2760.
- [23] Armstrong, Karen Andrea (2007). *The Relationship of Health Literacy and Locus of Control to Medication Compliance in Older African Americans*. Thesis, Georgia State University, doi: <https://doi.org/10.57709/1062191.210-250>.
- [24] Rabahi, S. (2022). *Health awareness among University of M'sila students: A cross-sectional study*. *Health Education Journal*, 81(1), 96-103. doi:10.1177/00179625211040992
- [25] Albushir, A. A. (2020). *The relationship between locus of control and health-promoting behaviors among university students in Yemen*. *Journal of Education and Health Promotion*, 9(1), 175. doi: 10.4103/jehp.jehp\_1004\_20.

- [26] Badeer, Shahindah Mahmoud. (2021). *The level of health awareness about infectious diseases in light of the emerging coronavirus pandemic COVID-19 among primary and preparatory school students in some Egyptian governorates*. Sohag University: Faculty of Education Journal. 800-865.
- [27] Rasheed R., Rizwan A., Javed H., Sharif F., Zaidi A. (2021). *Socio-economic and environmental impacts of COVID-19 pandemic in Pakistan—an integrated analysis*. Environ. Sci. Pollut. Res. 28, 19926–19943. doi: 10.1007/s11356-020-12070-7.
- [28] Fouda-Mbanga BG, Prabakaran E, Pillay K (2021) *Biopolymers: Recent Updates, Challenges and Opportunities. Ecotoxicology and Environmental Safety* 149:150–158.
- [29] Al-Saeedi, Tariq Mohammed (2020), *Youth's reliance on mobile journalism and its role in health awareness during the Corona pandemic in Egypt: A field study*. Journal of Media Research, Faculty of Media, Al-Azhar University, Issue 54, Part IV, July, pp. 2169-2226.
- [30] Breek, M., de Vries, N., & van Deursen, A. J. (2020). *The role of social media in the COVID-19 pandemic: A systematic review*. Social Science & Medicine, 255, 112994.
- [31] Abdulhafiz, A. (2020). *Social media use during the COVID-19 pandemic: A systematic review*. Computers in Human Behavior, 112, 106427.
- [32] Singh, Sanjay K., (2006): *Social work professionals' emotional intelligence, locus of control and role efficacy: an exploratory study*, Journal of Human Resource Management, Vol. 4, No. 2, pp. 39 – 45.
- [33] Gul, A. (2022). *Covid-19 pandemic: Current scenario and public risk perception in Pakistan*. Pakistan Journal of Public Health, 44(1), 1-8. doi:10.37532/pjph. v44i1.2617.
- [34] West, R., Michie, S., Rubin, G. J., & Amlôt, R. (2020). *Applying principles of behaviour change to reduce SARS-CoV-2 transmission*. Nature Human Behaviour, 4(5), 451-459. <https://doi.org/10.1038/s41562-020-0887-9>
- [35] Campos-Mercade, P., Meier, A. N., Schneider, F. H., & Wengström, E. (2021). *Prosociality predicts health behaviors during the COVID-19 pandemic*. Journal of Public Economics, 195, 104367. <https://doi.org/10.1016/j.jpubeco.2021.104367>
- [36] Saud, M., Mashud, M. I., & Ida, R. (2020). *Usage of social media during the pandemic: Seeking support and awareness about COVID-19 through social media platforms*. Journal of Public Affairs, 20(4), e2417. <https://doi.org/10.1002/pa.2417>.
- [37] Hassani, F., Karimi, F., & Hosseini, S. (2020). *Risk perception and methods for controlling health behavior*. International Journal of Preventive Medicine, 11(1), 1-8. doi: 10.4103/ijpvm.IJPVM\_202\_2019.
- [38] Pandey, Abhishek Kumar. (2014). *Socio-occupational functioning, perceived stigma, stress and coping of caregivers of children with mental retardation and functional psychosis: a comparative study*. Master's degree of philosophy in psychiatric social work, Ranchi University. ProQuest number 10166070. pp. 460-511.
- [39] Al-Tarif, Ghada Abdul Rahman. (2019). *Scientific research methods: Models and applications for designing social research*. Riyadh: Al-Mutanabbi Library.
- [40] Sharaf Enas Mansour Kamel (2021), *The adoption of students in the educational media departments on mobile phone journalism as a source of news, a field study*. Journal of Media Research, Faculty of Media, Al-Azhar University, Issue 2. 195.
- [41] Break, Ayman Mohamed Ibrahim (2020), *The role of mobile phone journalism in raising awareness among the Saudi public about the developments of the Corona pandemic crisis: A field study*. Al-Azhar University Journal of Media Research, Issue 54, Part VI, July 3588: 3682. January 1st, pp. 852-870.
- [42] Foda, Mohamed Sobhy Mohamed (2021). *The adoption of Egyptian students abroad on news websites and its relationship to shaping their health awareness towards the Corona crisis (Covid 19) A field study*. Journal of Media Research, Faculty of Media, Al-Azhar University, Issue 5654, Part One, January, pp. 158.
- [43] Abdulaziz (2020). *Introduction to Health Psychology*. Wael Publishing and Distribution House, Jordan.
- [44] Al-Bashir, Mortada and others. (2020). *Social media and promoting health awareness to prevent coronavirus*. Journal of Media Studies Issue 11. Arab Democratic Center. Berlin <https://democraticac.de/wp-content/uploads>.
- [45] Jacobs-Lawson, Joy & Waddell, Erin & Webb, Alicia. (2011). *Predictors of Health Locus of Control in Older Adults*. Curr Psychol. 30. 173-183. 10.1007/s12144-011-9108-z.

- [46] Deniz, M. & Tras, Z. & Aydogan, D., (2009): *An investigation of academic procrastination, locus of control, and emotional intelligence*, *Educational Sciences: Theory & Practice*, Vol. 9, No. 2, pp. 623 – 632.
- [47] Stuart, Marcia C., (2001): *An investigation of locus of control, psychological adjustment, and adjustment to college among international students from the Caribbean, enrolled at a private, Historically Black university*, Diss. Abst. Inter., Section A, Humanities and Social Sciences, Vol. 61, No. 8, A, p. 3071.
- [48] Salami, Samuel S., (2008): *Psychosocial factors as predictors of mentoring among nurses in Southwest Nigeria*, *Journal of Workplace Learning*, Vol. 20, No. 5, pp. 348 – 363.
- [49] Kulshrestha, A., & Sen, S. (2006). *Subjective well-being in relation to emotional intelligence and locus of control among executives*. *Indian Journal of Industrial Relations*, 42(1), 1-14.