



# The Swedish gamble: trust in the government and self-efficacy in the battle to combat COVID-19

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## Abstract

Governments around the world have issued movement restrictions and quarantines to combat the SARS-CoV-2 (COVID-19) pandemic. However, the Swedish government has not implemented such measures but has depended on individual responsibility. The extent to which individuals have been encouraged to trust in and be satisfied with government strategies and adopt personal health measures, such as social isolation, remains unclear. This study examines the direct effects of trust in the government and risk perception on self-efficacy. Most importantly, this study intends to explore whether satisfaction with government measures strengthens the relationships between 1) trust in the government and self-efficacy and 2) risk perception and self-efficacy. We test our suggested hypotheses using survey data obtained from 403 Swedish citizens living in Sweden. As predicted, the findings indicate that trust in the government and risk perception positively impact individual self-efficacy. Additionally, the findings reveal that satisfaction with government measures strengthens these relationships; more precisely, the impact of trust in the government and risk perception under a high level of individual satisfaction with government measures is much more positive than that under a low satisfaction level. In practice, a focus on implementing successful policies and excellent individual self-efficacy is required to halt the pandemic, and the findings indicate that combining strictly attentive and adaptive individual strategies with government strategies can minimize the spread of infection.

**Keywords** Risk Perception · Trust in Government · Satisfaction with Government Measures · Self-Efficacy · COVID-19

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## Introduction

Governments and health care systems worldwide have faced the greatest public challenge since World War II from the COVID-19 pandemic. SARS-CoV-2 (COVID-19) has spread to every continent, resulting in billions of people going into quarantine as health services struggle to cope with this virus (Wltz, 2020; World Health Organization, 2021a).

According to the World Health Organization (2021b), on November 6, 2021, Sweden had 15,050 deaths and 1,176,269 confirmed cases, which was relatively higher than those in neighboring countries, such as Norway, with only 920 deaths and 211,752 cases of infection, and Finland, with 162,476 infections and 1,185 deaths; worldwide, there were more than 248 million infections (World Health Organization, 2021c). Sweden's first case of COVID-19 was confirmed on February 3, 2020 (Wltz, 2020). The Swedish government has not undertaken any major strategies to combat the COVID-19 outbreak in the country and, instead, employed a less restrictive policy than its neighbors and other countries worldwide. Schools, restaurants, and shopping centers

in Sweden all remain open even though the World Health Organization has highlighted social distancing strategies as the primary method for reducing the spread of the virus. Rather than implementing lockdowns, Sweden has mostly cautioned citizens and recommended protective measures, thus relying on Swedish citizens' sense of social responsibility (Prime Minister's Office, 2020). The Swedish government's approach to addressing the outbreak has been very controversial, and some scientists argue that Sweden is adopting a policy similar to the herd immunity policy. Although Swedish officials have denied pursuing such a policy, the Swedish ambassador to the United States has said that "approximately 30 percent of people in Stockholm have reached a level of immunity" (May 2020).

An appeal signed by 2,000 Swedish scholars on March 28, including Carl-Henrik Heldin, Chairman of the Nobel Foundation, urged the government of Sweden to "immediately take steps to comply with the World Health Organization's recommendations" (Reynolds, 2020a, 2020b). Although the government has denied implementing a herd immunity strategy, the petition argues that Sweden has taken a herd immunity approach to the COVID-19 outbreak, stating that "The scientific evidence for the ability of SARS-CoV-2 to rapidly create herd immunity similar to an influenza virus is weak.." The petition has mentioned that "The experience from China and South Korea confirms that these measures are important and that they need to be incorporated as soon as possible" and "We still have some time to react and suppress the virus. Our nation should not be the exception in Europe. We request that our Government takes action now!" (Janouch, 2020). Regardless of whether Sweden's government is attempting to implement a herd immunity strategy, the adopted public policy approach is clearly very controversial (Habib, 2020; Vogel, 2021) because Sweden is among the few countries that have not implemented any major lockdowns (Meunier, 2020).

These measures have motivated a group of scientists in Sweden to start a non-profit organization to help disseminate factually correct information about COVID-19. "Our mission is to save lives and prevent all forms of suffering in the Covid-19 pandemic. We aim to provide an unbiased assessment of the ongoing scientific discussion to find the best path to handle the pandemic through scientifically informed and ethical decisions. The overall goal is to minimize the impact of Covid-19." (Välkommen, 2022).

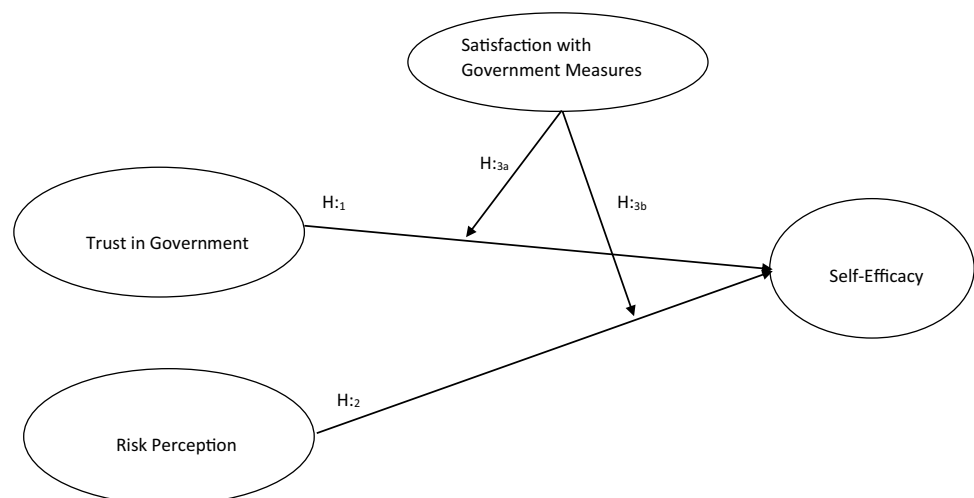
The resolution of the COVID-19 pandemic strongly depends on how the public reacts to such an outbreak and how the government responds to limit the hazard. Empirical evidence from the field is lacking on how satisfied Swedish people are with the actions executed by the government and how such satisfaction shapes their risk perception and self-efficacy. Such evidence is essential for understanding how government strategies shape citizens' behaviors (Feldman, 2020). Therefore, this study aims to explore Swedish people's level of satisfaction with the policy measures implemented in Sweden, the effect of such satisfaction on their risk perception and self-efficacy, and how Sweden's strategies shaped individual behavior during the pandemic. More precisely, this study observes the direct effect of trust in the government and risk perception on self-efficacy and explores whether satisfaction with government measures augments the positive effect of trust in the government and risk perception on self-efficacy. Figure 1 shows the proposed research model.

## Theoretical Background

### Self-Efficacy and Risk Perception

Self-efficacy is a person's belief in his or her capability to manage difficulties throughout his or her life (Bandura,

Fig. 1 Research Model



1997). Self-efficacy plays a vital role in encouraging individuals' motivation to manage personal difficulty during a crisis (Bandura, 1990). A prominent definition of this construct by Bandura (1990) (p. 28) describes perceived self-efficacy as “the capacity to exercise self-influence by personal challenge through goal setting and evaluative reaction to one's performances.” Furthermore, as per social cognitive theory (Bandura, 1997), self-efficacy is considered a form of “personal control” over one's behavior, resulting in a change in behavior during a crisis. The leading theory that conceptualizes self-efficacy is social cognitive theory, which argues that the adaptation of constructive behaviors and avoiding ignorant behaviors during a crisis are challenging because most individuals find it challenging to change their behavior. At the core of social cognitive theory is self-efficacy beliefs (Andrus & Roth, 2002).

Social cognitive theory discusses self-efficacy as a vital factor that shapes human adaptation and change in general. The theory is rooted in the understanding that people are self-regulated, organized, self-reflective and not driven to make choices based on inner impulses. In addition, this theory provides a conceptual framework that provides a roadmap to understand the factors shaping self-efficacy beliefs by focusing on the idea that individuals are proactively engaged in personal development and can make judgments that produce self-fulfilling actions as a tool to exercise self-control. The theory argues that people's interpretation of their personal state, such as how they feel and think, and environmental factors influence their ability to inform and alter their behavior (Stein, 2016). Bandura (1986) (p.25) stated that “what people think, believe, and feel affects how they behave.”

Self-efficacy beliefs can affect human functioning by influencing the choices individuals make. Individuals tend to choose activities and tasks that they feel comfortable with and might even pursue a course of action that they view as undesirable to achieve the desired outcome. Self-efficacy is vital during a crisis because it helps individuals determine the amount of effort needed to achieve a goal, how long they can sustain their determination when confronted with an obstacle, and—most importantly—the level of resilience they demonstrate when facing adverse situations (Bandura, 1990; McKellar & Sillence, 2020).

Previous studies advocate that self-efficacy can be directly affected by a disease outbreak, which leads people to implement precautionary activities (de Zwart et al., 2009). Moreover, studies have shown that self-efficacy is a significant element encouraging health-related goals and behaviors (Sheeran et al., 2016; Agha, 2003). Self-efficacy beliefs have a powerful influence on people's actions because they strongly affect how people feel, think, and act (Wong & Yang, 2020). Various factors shape the strength of the relationship. To understand how self-efficacy beliefs

shape individuals' behaviors during the COVID-19 pandemic, risk perception must be considered.

Self-efficacy beliefs differ based on each individual personality and grow through systematized practices (Haverback & Mee, 2015). The COVID-19 pandemic has created a situation in which it is difficult to predict how people will respond to the challenge. This study argues that it is vital to analyze how risk perception affects self-efficacy during the pandemic (Bebas, 2016).

Risk perception refers to a person's perception of the likelihood that a health incident (e.g., disease) will occur (El-Toukhy, 2015; Slovic, 2000). Risk perception depends on the following two factors. The first factor is severity, which refers to a person's perception of the ferocity of a specific disease (Rimal & Real, 2003), and the second factor is susceptibility, which reflects a person's perception of the possibility of being infected with a disease (Choi et al., 2017; El-Toukhy, 2015).

When conceptualizing risk perception and self-efficacy during a health crisis, the health belief model can assist in theoretically understanding the relationship. This model explains individuals' behaviors and behavioral changes (Rosenstock, 1974). A key element of the model is its focus on the factors that influence individual beliefs about their ability to promote their health, particularly for people who are not motivated to do so. The model emphasizes the factors that influence health behavior and what an individual perceives as a threat to health, denoted as perceived susceptibility or perceived severity, focusing on an individual's belief in the consequence if confronted with a health hazard. In addition, the model stresses self-efficacy beliefs as factors that shape people's confidence in their ability to adapt to behavior changes during a health crisis. The model focuses on the following three ideas: people's perception, mainly risk perception; modifying factors, which are related to demographic variables; and the likelihood of action, which is mainly related to self-efficacy beliefs that focus on personal motivation to adopt health measures (Janz & Becker, 1984; Rosenstock & Strecher, 1988).

People tend to perceive risk strongly, mainly when a public health hazard occurs (Pask & Rawlins, 2016), such as during the H1N1 flu and MERS outbreaks, because the emergence of an infectious virus leads the public to assess the disease risks immediately (Oh et al., 2015; Reynolds and Seeger, 2005). Thus, examining how the community perceives risk related to a public health hazard can facilitate the management of public behavior to avoid more infections and promote preventive measures. Examining how risk perception affects the formation of self-efficacy beliefs throughout a public emergency is vital (Choi et al., 2017). In this study, the extended parallel process model and protection motivation theory are used in tandem to conceptualize risk perception. Risk perception is explained in relation to

perceived severity and susceptibility, which together constitute people's risk perception. Additionally, some theories suggest that risk perception is the primary driving factor in the adoption of preventive measures and the promotion of protective behaviors (self-efficacy) during a health crisis (Rogers, 1983; Witte, 1992); hence, the conceptualization of risk perception must consider its influence on self-efficacy because a high level of perceived risk is necessary for the adoption of recommended health behaviors (self-efficacy). Risk perception is the key element in motivating individuals to change their health behavior (Rimal & Real, 2003).

The health benefit model highlights that individuals are likely to initiate preventive actions if they perceive the susceptibility and the severity to be serious. Hence, the model argues that risk perception is a central factor in individual behavior change because it ultimately shapes their self-efficacy beliefs. Social cognitive theory and the health belief model are widely used to assist individuals in learning how to adopt healthy behaviors during a health crisis (McKellar & Sillence, 2020).

Therefore, risk perception shapes people's beliefs regarding their cognitive ability to adapt to or refrain from certain behaviors during a crisis (Bandura & Watts, 1996; Slovic, 2000). Risk perception and self-efficacy play a critical role during a public health hazard because they promote the adaptation of constructive health behaviors among the public and help maintain behavioral changes during a crisis (Bandura & Watts, 1996). Risk perception shapes personal self-efficacy; however, risk perception differs in its effects on how people feel and act. Regarding behavior, self-efficacy enhances one's eagerness to act. Individuals with high self-efficacy are likely to achieve more during a challenging task because they establish higher goals and are committed to achieving such goals (Locke & Latham, 1990). Hence, self-efficacy behaviors during a public health crisis led to enhanced personal motivation, which results in changes in behavior and perception (Dorsey et al., 1999).

Regarding feelings, individuals with low self-efficacy might experience feelings of helplessness during a crisis depending on how they perceive the risk of a crisis and their ability to control their behavior (Schwarzer & Fuchs, 1996). Studies of this phenomenon have highlighted the relationship between risk perception and self-efficacy and have demonstrated that public risk perception shapes self-efficacy throughout public health emergencies (Coleman & Iso-Ahola, 1993; Han et al., 2014; Han et al., 2014). However, the relationship between risk perception and self-efficacy depends highly on various factors. This study proposes that this relationship is affected by people's trust in the government and satisfaction with its measures during a pandemic. Hence, the model proposed in this study further examines the factors shaping people's risk perception and self-efficacy during the COVID-19 pandemic.

## Trust in the Government and Self-Efficacy

Different countries have reacted differently to the pandemic; these differences provide a starting point for our investigation of the societal and psychological factors related to the spread of COVID-19. A social sciences perspective could help us understand mortality during the COVID-19 pandemic. Social factors, which should always be understood in their ecological context, are important in epidemics (Morse, 1996). For example, public social activity affects the spread of viruses. European countries vary significantly in their population density, and differences also exist in the number of daily interactions and social contacts that people have (Sorokowska et al., 2017). In addition, significant cultural differences exist in the physical distance that people keep when interacting with their close friends and others (Latané et al., 1995; Hassan, Al Halbusi, et al., 2021a, b, c). For instance, southern European countries have traditionally been considered contact cultures, whereas northern Europe and Asia are considered noncontact cultures. During an epidemic, both the physical and social closeness of people are factors influencing the spread of the disease (Remland et al., 1995; Sorokowska et al., 2017).

Another important social factor explaining the spread of viruses is trust. Trust in institutions and trust in other people are considered essential factors for societies' well-being and overall functioning (Newton, 2001; Uslander, 2002). In particular, institutional trust can be a crucial part of epidemic management and prevention because trust in public systems and authorities, such as health care systems, influences how people use services and follow instructions (Rowe & Calnan, 2006). Thus, trust in institutions becomes important after disruptive events, such as terrorist attacks, natural disasters, and epidemics (Dinesen & Jæger, 2013; Norris et al., 2008). Research evidence from previous epidemics has shown that those who had lower trust in the government were less likely to take precautions against the Ebola virus in Liberia and Congo during the 2014–2016 outbreak (Blair et al., 2017; Vinck et al., 2019). Similar effects were noted during the 2002–2004 SARS outbreak in Hong Kong (Tang & Wong, 2005). Similarly, greater trust in authorities was associated with engaging in avoidant behaviors during the swine flu epidemic in the United Kingdom (Rubin et al., 2009).

Numerous studies have previously verified significant country differences in institutional trust, rendering the societal element of trust essential (Marien & Werner, 2019; Sønderskov & Dinesen, 2016). Compared with other countries, trust in state institutions is typically higher in Nordic countries (e.g., Finland, Denmark, Iceland, Norway, and Sweden), ranking high according to different worldwide welfare statistics (Marozzi, 2015). In other places in Europe, institutional trust is low, particularly in eastern and southern European countries, such as Italy (Hudson, 2006; OECD, 2020). The determinants of institutional trust vary across

Europe; however, a perceived lack of responsiveness by political and governmental entities often results in low levels of trust in institutions on behalf of the public. In east-central Europe, older individuals have shown more trust toward institutions, whereas trust in political institutions is lower among more educated people (Boda & Medve-Balint, 2014). In southern European countries, such as Italy and Spain, the public exhibits low institutional trust, and attitudes toward political institutions are deeply rooted in the cultural legacy (Cole & Cohn, 2016). The combination of social closeness and a lack of trust in authorities might become lethal in Europe. Therefore, based on the aforementioned arguments, trust in authority is important. The Swedish government's strategies differ from those implemented in other countries during the COVID-19 pandemic because of the degree of trust between the public and authorities, which helps build individual confidence and self-efficacy among individuals to avoid risk during the pandemic (Ter Huurne & Gutteling, 2009; Thaker et al., 2019).

### Contingent Role of Satisfaction with Swedish Government Measures

During the COVID-19 outbreak, common strategies adopted by most affected countries included lockdowns and stay-at-home orders as measures to keep citizens separated to break the chain of transmission. However, Sweden adopted a vastly different method to combat the COVID-19 outbreak; primary schools, restaurants, bars, gyms, and public parks have remained open. However, companies were encouraged to allow their employees to work from home at their discretion.

Anders Tegnell, an epidemiologist, advocated for such strategies and refused to implement WHO guidelines regarding lockdowns and quarantines. Deputy Prime Minister Isabella Lövin defended this strategy and noted that Sweden considers the COVID-19 pandemic a “marathon, and not a sprint” and that citizens in countries that implement strict measures eventually do not obey these measures (Anderson, 2020). Thus, Sweden's measures addressing COVID-19 are based on the critical element of citizen responsibility, whereas the government highlights the necessary actions, such as social distancing with elderly individuals, and provides full autonomy to its citizens (Rolander, 2020). In particular, the Swedish Prime Minister recently said that “our government agencies and our health care system are doing everything they can. However, every person in Sweden needs to take individual responsibility. If everyone takes responsibility, we can keep the spread of the virus in check. Follow the authorities' advice: if you have even the slightest symptoms, do not go to work and refrain from meeting other people” (Prime Minister's Office, 2020).

However, based on the number of deaths and infections linked to COVID-19, Sweden has high infection and

death rates, especially senior homes. The Swedish health care system has not been burdened with many hospitalized patients because Sweden has significant ICU capacity (Anderson, 2020). In addition, the success or failure of Sweden's response to the COVID-19 outbreak will be unclear for many months, but the primary determinant of the success of such a policy could be whether Sweden can achieve natural herd immunity. However, the success of any policy in Sweden fundamentally depends on public satisfaction with the unique measures employed by the government.

### What is Natural Herd Immunity

COVID-19 is triggered by a new zoonotic coronavirus that emerged in China in 2019 (Zhu et al., 2020). The COVID-19 pandemic has affected more than 202 countries worldwide and has resulted in more than 3 million infections. SARS-CoV-2 is extremely infectious and can be spread via droplets. Different nations have pursued diverse strategies to combat the spread of the infection, and the most common policy is social distancing. However, Sweden has implemented different policies, and the results of these measures will likely promote the attainment of herd immunity (Reynolds, 2020a, 2020b).

Herd immunity is a well-known concept in the field of epidemiology and has previously been a successful strategy. Before the development of vaccines, herd immunity was the only line of defense against infections. Nevertheless, this concept has numerous definitions. Based on the literature, natural herd immunity is understood as immunity that naturally occurs when people become immune to a disease after being infected. The natural immune system response is triggered when the human body produces antibodies against the virus that cause the infection. Antibodies act as a safeguard against any future infection by the specific disease; if a person who develops these antibodies after infection encounters the same virus, the antibodies will protect that person from reinfection (Anderson & May, 1985; Fine, 1993).

The most recognized description of herd immunity was provided by Fox (1983, p. 463), who defined this concept as “the resistance of a group to attack by a disease to which a large proportion of the members are immune, thus lessening the likelihood of a patient with a disease coming into contact with a susceptible individual.” Fox further added that the theory of herd immunity holds that the individual transmission chain of infectious diseases is likely to break when most of the population is immune; thus, the higher the number of people who are immune to the disease, the lower the number of people who become infected. Additionally, Metcalf et al., (2015, p. 753) highlighted herd immunity as a “population-scale immunity,” indicating that approximately 70% of the population must have immunity through either vaccination or naturally acquired immunity for herd immunity to be

effective (d'Souza and Dowdy, 2020). Herd immunity is successful when immune individuals break the chain of infection by being unable to transmit the disease, which likely slows or stops the spread of the virus. Because no vaccine was available for COVID-19 during the period of this study, this study focuses on naturally acquired immunity, which is called natural herd immunity. In contrast, vaccine immunity occurs when most of the population has gained immunity by using a vaccine for a certain disease, such as smallpox. Through the use of vaccines (John & Samuel, 2000), many people developed immunity against the virus and smallpox was declared eradicated as of 1980 (Fenner et al., 1988). If achieved, herd immunity has the ability to ensure the elimination of specific diseases (Williams, 2006).

The SARS-CoV-2 virus is similar to other coronaviruses, specifically in terms of their genetic code, and researchers argue that individuals who become infected with the virus can develop immunity for months and possibly years (d'Souza and Dowdy, 2020). Although the Swedish government has declared that its approach to combating COVID-19 is not a herd immunity approach, most news outlets and researchers claim that Sweden's approach is similar to the natural herd immunity strategy. Swedish government representatives have noted that even though their country is not adopting an explicit herd immunity strategy, the principle of the herd immunity approach is "in there in the mix" (Brueck, 2020). Thus, according to a recent study, for the "herd immunity" approach to be successful in Sweden, 70.9% of the population must be immune to the virus (Kwok et al., 2020).

On April 24, twenty-two Swedish doctors and researchers criticized the government's strategy and argued that the approach is doomed to fail and must be changed immediately; they highlighted the need for social distancing measures to be strictly enforced by the government (Nikel, 2020; Nyheter, 2020). Hence, in this study, we examine how satisfied Swedish people are with the current measures implemented by the government and how such satisfaction shapes people's risk perception and self-efficacy throughout the pandemic.

Based on the overall literature, we hypothesize that trust in the government positively impacts individual self-efficacy (H1) and that risk perception is positively related to individual self-efficacy (H2). Furthermore, we predict that the positive relationship between trust in the government and individual self-efficacy is strengthened when Swedish citizens display a higher level of satisfaction with the Swedish government's measures (H3a). Similarly, H3b asserts that the positive association between risk perception and individual self-efficacy increases as Swedish citizens show higher satisfaction with the Swedish government's measures, as indicated in Fig. 1.

## Research Hypotheses

The following hypotheses are posited in this study:

- **Hypothesis 1.** Trust in the government is significantly related to individual self-efficacy.
- **Hypothesis 2.** Risk perception is significantly related to individual self-efficacy.
- **Hypothesis 3a.** Satisfaction with government measures moderates the relationship between trust in the government and individual self-efficacy such that the relationship is stronger among individuals who are highly satisfied with government measures than among individuals who are less satisfied with government measures.
- **Hypothesis 3b.** Satisfaction with government measures moderates the relationship between risk perception and individual self-efficacy such that the relationship is stronger among individuals who are highly satisfied with government measures than among individuals who are less satisfied with government measures.

## Method and Materials

Having an accurate and sufficient sample size is very important (Ryan, 2020). Therefore, in the current study, G-Power 3.1 was employed to determine the appropriate sample size (Faul et al., 2007). Relying on the criteria proposed by Cohen (1992), the preferable power is greater than 0.80, such as 0.90 or 0.95, with a mediating effect size of 0.15. However, the minimum sample size required to examine the proposed research model with three predictors is 108 cases according to the aforementioned criteria. Thus, we collected our data from 403 Swedish citizens currently living in Stockholm and Småland in Sweden. The survey was carefully designed using a Google Form and began with a cover letter sent to 500 individuals. The cover letter explained the purpose of the survey and assured the participants of the confidentiality of their responses.

The data were collected from Swedish individuals during the COVID-19 pandemic. In particular, the sample for this study is individuals living/located in Sweden who have an active social media account (e.g., WhatsApp, Facebook, Twitter, or Instagram). These individuals were reached via relatives and friends. Data were kept confidential during the data collection process to protect participants' privacy. When distributing the questionnaire, the researcher also explained the confidentiality of the questionnaire to all respondents by clarifying the data collection process and assured the respondents that this study was for academic purposes. Nevertheless, of 500 questionnaires, only 403 responses were returned, yielding a response rate of 80%. We collected information on participants' location,

age, gender, and education. Regarding location, 47.4% of the participants were from Småland, and 52.6% were from Stockholm. Regarding age, 6.0% of the participants were younger than 25 years, 43.2% were aged between 25 and 30 years, 36.2% were aged between 31 and 40 years, 10.7% were aged between 41 and 50 years, and 4.0% were aged 51 years or older. Regarding gender, 33.5% of the respondents were male, and 66.5% of the respondents were female. Regarding educational level, 1.5% of the respondents had completed only high school, 50.1% held a bachelor's degree, 33.7% held a master's degree, and 14.6% held a doctorate (see Table 1).

## Measures

All measures were obtained from previous valid studies. Prior to the main data collection phase, the questionnaire was tested by three academic experts in related fields. We purposely approached these experts to ensure that the items' contents were accepted. Thus, the experts recommended minor changes and validated the questionnaire's clarification, readability, comprehension, and appropriateness. Then, at the final stage prior, the experts verified that the adapted questions were suitable for this study framework and were easily understood by respondents. In addition, the cognitive interview approach was employed with five individuals, as recommended (Hulland et al., 2018), to check the questionnaire's clarity, readability, and suitability. The questionnaire was approved with minor modifications. To ensure that the questioned items employed in this study are statistically reliable, the study assesses common method variance, item loadings, construct reliability, convergent validity, and HTMT. All these measurements have indicated no issues in terms of validity and reliability.

**Table 1** Profile of Respondents

Demographic Item	Categories	Frequency	Percentage
Location	Småland	191	47.4
	Stockholm	212	52.6
Gender	Male	135	33.5
	Female	268	66.5
Age	Under 25 Years	24	6.0
	25–30 Years	174	43.2
	31–40 Years	146	36.2
	41–50 Years	43	10.7
	51 Years or Older	16	4.0
Education Level	High School	6	1.5
	Bachelor's Degree	202	50.1
	Master's Degree	136	33.7
	Doctorate Degree	59	14.6

All items were assessed on a 5-point Likert scale. Trust in the government was measured using 3 items from Grimmelikhuijsen (2012). One item was as follows: “During the current pandemic, the government has cared about the well-being of citizens.” Eight items were adopted from Rubin et al. (2014) to evaluate risk perception, and one item was as follows: “I have little control over whether I will catch COVID-19 (SARS-CoV-2).” Regarding satisfaction with government measures, we asked individuals about their perception of how the Swedish government has dealt with the COVID-19 crisis and has communicated measures to cope with the crisis. Thus, satisfaction with government measures was measured using 4 items obtained from Willem's et al. (2020). One item was as follows: “How satisfied are you with how you are complying with government measures to cope with the COVID-19 crisis.” Five items were adapted from Rimal and Real (2003) to measure self-efficacy. One item was as follows: “I am confident in my ability to protect myself from COVID-19 (SARS-CoV-2).” Finally, age, gender, and education served as control variables to rule out alternative explanations of our findings and reduce errors (Becker, 2005). Age and education were measured with an ordinal scale anchored between 1 (younger, lower education) and 5 (older, higher education). However, gender was dichotomized (0 = male, 1 = female). Specifically, percentages were used for gender, and 68% of the respondents were males. Interval scales (from 1 to 5) were used to measure age (1 = up to 25; 2 = between 25 and 30; 3 = between 31 and 40; 4 = between 41 and 50; 5 = over 50) and level of education (1 = high school; 2 = diploma; 3 = bachelor's degree; 4 = master's degree; 5 = doctorate) (Table 4).

## Data Analysis and Results

To assess the proposed hypotheses, structural equation modeling (SEM) with partial least squares (PLS) using Smart PLS 3.2.8 software (Henseler et al., 2015) was performed, which was considered an appropriate and suitable option for several reasons. This powerful, robust statistical procedure does not require strict assumptions regarding the distribution of the variables and is appropriate for complex causal analyses with both first- and second-order constructs (Hair et al., 2017; Henseler et al., 2009). Furthermore, we examined the statistical significance of the path coefficients using the 5,000 subsamples technique to generate bootstrap t-statistics with  $n-1$  degrees of freedom (where  $n$  is the number of subsamples) (Al halbusi et al., 2019; Hassan, Ariffin, et al., 2021; Hassan, Raja Ariffin, et al., 2021).

## Common Method Variance (CMV)

Since our data were derived from the same single source, we adopted numerous measures to reduce the risk of

common method bias (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003). First, the respondents received descriptions of each construct and clear directions regarding how to complete the evaluations to avoid any confusion. Additionally, the respondents were reassured of the confidentiality of their identities and the academic nature of the study.

In addition to these ex-ante procedural remedies, we conducted several post hoc tests to evaluate the risk of CMV biasing the findings. Although CMV cannot inflate our interaction terms (MacKenzie & Podsakoff, 2012), which are the central emphasis of this study, we decided to check for this issue. First, the single-factor test approach of Harman (1976) was used to estimate CMV bias, and the results did not reveal any concerns. Using exploratory factor analysis, we investigated whether a single factor could explain the majority of the covariance among the items in the study. The test revealed five factors with eigenvalues greater than 1, which accounted for 68% of the total variance, and the variance in the first factor accounted for only 29% of the total variance. Thus, this test suggests that CMV is not a serious concern (Afthanorhan et al., 2021; Podsakoff et al., 2003). Second, we performed a full collinearity test based on variance inflation factors (VIFs) (Kock, 2015). We followed the guidelines described by Kock and Lynn (2012), who proposed performing such a test to assess both vertical and lateral collinearity. Kock and Lynn (2012) note that a VIF greater than 3.3 indicates pathological collinearity, suggesting that CMV might contaminate the model. However, as shown in Table 2, this study is considered free of CMV.

### Measurement Model Assessment

According to Hair et al. (2017), prior to using a structural model, its characteristics (item reliability, internal consistency reliability, convergent validity, and discriminant validity) should be confirmed. These features were all checked, beginning with item reliability. As shown in Table 3, most items were greater than the threshold level of 0.707 (Hair et al., 2017, 2019). We used Cronbach's alpha and composite reliability to measure the constructs' internal consistency. Table 3 indicates that both techniques showed satisfactory values ranging from

0.802 to 0.856 and from 0.796 to 0.893, which are higher than the cutoff of 0.70 (Hair et al., 2017, 2019). Regarding convergent validity, the average variance extracted (AVE) also achieved values ranging from 0.517 to 0.737, which exceeded the threshold of 0.5 (Hair et al., 2017, 2019) (see Table 3).

In addition, we checked discriminant validity by the AVE and heterotrait-monotrait ratio (HTMT). As shown in Table 4, no issue exists with discriminant validity because the AVE of each construct was greater than the variance that each construct shared with the other latent variables (Hair et al., 2017). Additionally, the HTMT values were less than 0.90, confirming the discriminant validity of each pair of variables. All HTMT values significantly differed from 1, and the 95% confidence intervals (CI) did not include 1 (Henseler et al., 2015), confirming the discriminant validity of each pair of variables (see Table 5).

### Structural Model Assessment

When explaining the dependent variable of this study (i.e., self-efficacy), only age among our demographic variables showed a significant effect on self-efficacy, whereas the other variables (i.e., gender and education) displayed nonsignificant effects (see Table 6), possibly because this pandemic is relatively new, and people do not have much experience with how to address it, especially young people. However, older adults might have previously faced pandemics, such as the respiratory syndrome coronavirus (MERS-CoV) that occurred between 2012 and 2013, which could explain why age was significant (Davies et al., 2020).

Table 6 also presents the findings related to the hypotheses. In support of  $H_1$ , the results illustrated that trust in the government significantly and positively influenced self-efficacy ( $\beta = 0.120$ ,  $p < 0.001$ ). Additionally, the results revealed that risk perception as predicted in  $H_2$  positively shaped self-efficacy ( $\beta = 0.391$ ,  $p < 0.000$ ). Thus, the findings revealed that trust in the government and risk perception had a positive, significant direct effect on individual self-efficacy, supporting  $H_1$  and  $H_2$ .

Additionally, to test interaction hypotheses 3a and 3b, the standardized scores of the variables were used to minimize multicollinearity in the analysis (Low & Mohr, 2001). Once the independent variables and moderators were introduced, their interactions with the moderator variable were included. As shown in Table 6, this process revealed a significant interaction effect between trust in the government and satisfaction with government measures on self-efficacy ( $\beta = 0.105$ ,  $p < 0.021$ ) and between risk perception and satisfaction with government measures on self-efficacy ( $\beta = 0.204$ ,  $p < 0.018$ ). Therefore, our proposed moderation was statistically significant. To help interpret these interaction effects, we followed previous recommendations by Dawson (2014) and plotted the high versus low satisfaction with government

**Table 2** Common Method Variance Assessment Via Full Collinearity Estimate Criteria

Variable	Risk Perception	Satisfaction with Government Measures	Self-Efficacy	Trust in the Government
VIF	1.308	1.151	1.267	1.137

VIF = Variance inflation factor



**Table 3** Measurement Model, Item Loadings, Construct Reliability, and Convergent Validity

Constructs	Labeled	Indicator Descriptions	Loading (>0.5)	CA (>0.7)	CR (>0.7)	AVE (>0.5)
Trust in the Government	TIGO1	During the COVID-19 pandemic, the government has cared about the well-being of citizens	0.869	0.820	0.893	0.737
	TIGO2	During the COVID-19 pandemic, the government has kept its promises	0.798			
	TIGO3	During the COVID-19 pandemic, the government has carried out its duties effectively	0.904			
Risk Perception	RISP1	If I do not take any preventive action, then I am likely to catch COVID-19 (SARS-CoV-2)	0.630	0.848	0.882	0.683
	RISP2	I have little control over whether I will catch COVID-19 (SARS-CoV-2)	0.724			
	RISP3	COVID-19 (SARS-CoV-2) would be a serious illness for me	0.665			
	RISP4	If I catch COVID-19 (SARS-CoV-2), it will have major consequences for my life	0.704			
	RISP5	COVID-19 (SARS-CoV-2) would be a mild illness for me	0.674			
	RISP6	If I catch COVID-19 (SARS-CoV-2), it will have a large effect on me	0.729			
	RISP7	If I catch COVID-19 (SARS-CoV-2), it will have serious financial consequences for me	0.682			
	RISP8	If I catch COVID-19 (SARS-CoV-2), it will cause difficulties for people who are important to me	0.747			
Satisfaction with Government Measures	SWGM1	How satisfied are you with how you are complying with the government measures to cope with the COVID-19 crisis?	0.738	0.856	0.796	0.517
	SWGM2	How satisfied are you with how the federal government is addressing the COVID-19 crisis?	0.749			
	SWGM3	How satisfied are you with how the federal government is communicating its measures for coping with the COVID-19 crisis?	0.740			
	SWGM4	How satisfied are you with how the Swedish population overall is complying with the measures enacted by the government to cope with the COVID-19 crisis?	0.918			
Self-Efficacy	Self-Eff1	I am confident in my ability to protect myself from COVID-19 (SARS-CoV-2)	0.878	0.802	0.866	0.573
	Self-Eff2	I am certain that I will take the required actions even if they are difficult or inconvenient	0.911			
	Self-Eff3	I have the willpower to engage in precautionary actions	0.789			
	Self-Eff4	I am confident that I can carry out precautionary actions	0.613			
	Self-Eff5	I am certain that I can control my behavior to reduce the chances of contracting COVID-19 (SARS-CoV-2)	0.518			

CA = Cronbach’s Alpha, CR = Composite Reliability, AVE = Average Variance Extracted

measures regression lines (+ 1 and –1 standard deviation from the mean) of each effect. The resulting graph of the first interaction effect shows that the positive relationship between trust in the government and self-efficacy is more substantial (the slope is more pronounced) when individuals have a high rather than a low level of satisfaction with

government measures, supporting H<sub>3a</sub> (Fig. 2). Regarding the second interaction effect, the graph reveals that the positive relationship between risk perception and self-efficacy is stronger (the slope is more pronounced) when individuals have a high rather than a low level of satisfaction with government measures, supporting H<sub>3b</sub> (Fig. 3).

**Table 4** Descriptive Statistics, Correlation Matrix, and Square Roots of the Reflective Constructs' AVE

	Mean	SD	1	2	3	4	5	6	7
1. Trust in the Government	4.286	0.828	<b>0.737</b>						
2. Risk Perception	4.007	0.571	0.290	<b>0.683</b>					
3. Satisfaction with Government Measures	5.815	0.951	0.302	0.278	<b>0.523</b>				
4. Self-Efficacy	4.771	0.954	0.181	0.347	-0.057	<b>0.572</b>			
5. Age	2.635	0.897	0.037	0.039	0.006	0.146	--		
6. Gender	--	--	0.163	0.091	-0.005	0.092	0.092	--	
7. Education	2.615	0.749	0.111	0.143	-0.008	0.038	0.409	0.289	--

SD= Standard deviation. The bold values on the diagonal represent the square roots of the average variance extracted shared between the constructs and their respective measures. The off-diagonal elements below the diagonal are the correlations among the constructs; values between 0.12 and 0.15 are significant at  $p < 0.05$ , and values higher than 0.16 are significant at  $p < 0.01$  (two-tailed test)

**Table 5** Heterotrait-Monotrait Ratios of Correlations (HTMT)

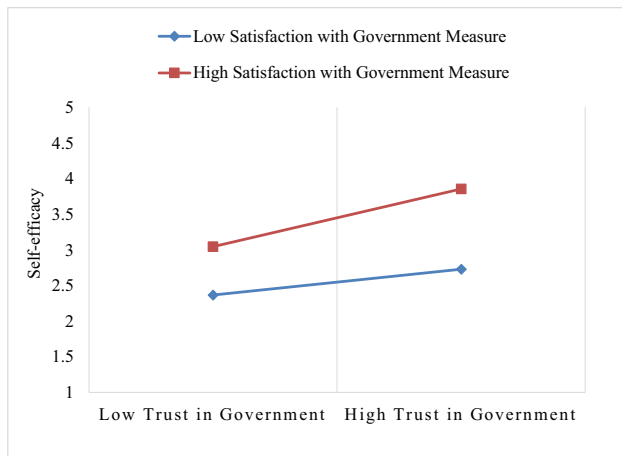
	1	2	3	4	5	6	7
1. Trust in the Government		0.291 [0.200;0.353]	0.198 [0.145;0.320]	0.183 [0.069;0.270]	0.036 [0.071;0.137]	0.163 [0.068;0.250]	0.110 [0.004;0.199]
2. Risk Perception			0.193 [0.044;0.312]	0.165 [0.263;0.246]	0.046 [0.191;0.124]	0.109 [0.289;0.116]	0.030 [0.156;0.172]
3. Satisfaction with Government Measures				0.373 [0.253;0.449]	0.054 [0.051;0.158]	0.061 [0.041;0.156]	0.128 [0.009;0.234]
4. Self-Efficacy					0.145 [0.048;0.236]	0.090 [0.004;0.196]	0.037 [0.074;0.132]
5. Age						0.092 [0.027;0.183]	0.289 [0.187;0.358]
6. Gender							0.289 [0.187;0.358]
7. Education							

For discriminant validity, HTMT values for each pair of constructs should be lower than 0.85 and their 95% confidence intervals should not contain the number 1

**Table 6** Direct and Interaction Effects

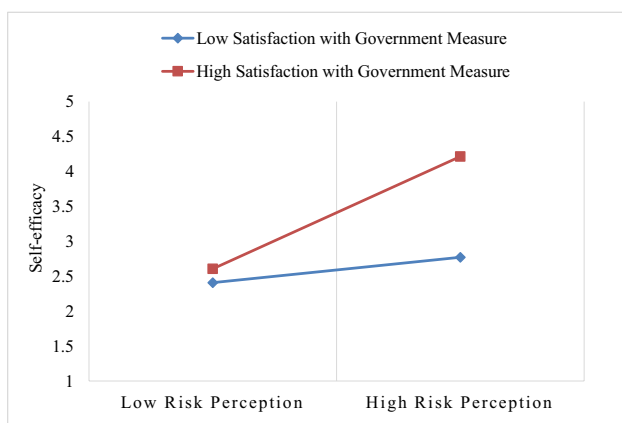
Direct Effect	Standardized $\beta$	t-value	95% Confidence Interval	Bias Correct
Self-Efficacy ( $R^2=0.56$ )				
Trust in the Government	0.120***	2.064	[0.039; 0.227]	sig
Risk Perception	0.391***	7.376	[0.300; 0.475]	sig
Interaction Effect				
Trust in the Government x Satisfaction with Government Measures Justice	0.105**	2.045	[0.015; 0.195]	sig
Risk Perception x Satisfaction with Government Measures	0.204**	2.105	[0.119; 0.344]	sig
Control Variable				
Age	0.154	3.091	[0.114; 0.399]	
Gender	-0.005	0.170	[-0.004; 0.061]	
Education	-0.006	0.616	[-0.002; 0.071]	

\*\*\*  $p < .001$  (one-tailed test):  $t_{(4,999)} = 3.10$ , \*\*  $p < 0.01$  (one-tailed test):  $t_{(4,999)} = 2.33$ , \*  $p < .05$  (one-tailed test):  $t_{(4,999)} = 1.65$ ; (to test the effects of the control variables, a two-tailed test of a student t distribution was conducted instead). Bootstrapping based on  $n=5,000$  subsamples, where a bootstrap t-statistic with  $n - 1$  degrees of freedom was used ( $n$  is the number of subsamples); ns=not significant, sig=significant



**Fig. 2** Interaction effects between trust in the government and satisfaction with government measures on self-efficacy

Regarding the explanatory power of the suggested model, the model explains 0.56% of the total variance in self-efficacy (Table 4), which implies a significant moderating effect of this model on this variable, according to Hair et al. (2017). In addition, the Stone-Geisser blindfolding sample reuse technique revealed a Q-square value greater than 0; thus, the model effectively predicts self-efficacy ( $Q^2 = 0.212$ ) (Hair et al., 2017). Finally, we also checked the overall goodness-of-fit (GoF). The standardized root means square residual (SRMR) index had a value of 0.043, which is far below the cutoff of 0.08 (Henseler, 2017). Additionally, the SRMR's 95% bootstrap quantile is 0.051 and, thus, higher than the SRMR value, indicating that the model is a good fit (Hair et al., 2017). The discrepancy indexes unweighted least squares discrepancy (dULS) and geodesic discrepancy (dG) are also under the bootstrap-based 95<sup>th</sup> percentile ( $dULS = 1.431 < HI\ 95\ of\ dULS = 2.512$ ;  $dG = 0.564 < HI\ 95\ of\ dG = 0.989$ ) (Hair et al., 2017). Overall, the discrepancy



**Fig. 3** Interaction effects between risk perception and satisfaction with government measures on self-efficacy

between the empirical and model-implied correlation matrixes is nonsignificant, suggesting that no reason exists to reject the model and that the tested model is likely valid (Henseler, 2017).

## Discussion and Conclusion

The primary purpose of this research is to examine the influence of trust in the government and risk perception on self-efficacy during the COVID-19 pandemic. Additionally, this study was designed to analyze whether satisfaction with government measures enhances the positive effects of trust in the government and risk perception on self-efficacy. More precisely, we built our argument based on the suggestion in Hussain (2020) that trust in a government's strategy and risk perception profoundly depends on satisfaction with the government measures implemented to combat the spread of COVID-19. Therefore, the findings of this study allow us to draw meaningful conclusions. First, trust in the government is significantly associated with self-efficacy, indicating that individuals with high levels of trust in the government, specifically during the current pandemic, have high levels of self-efficacy. Thus, people who trust their government during a public health hazard will likely demonstrate positive self-efficacy beliefs because trusting the government is essential in controlling public behavior during a health crisis (Bandura & Watts, 1996; Slovic, 2000).

An important aspect of trust is the asymmetry principle. This concept refers to trust as a fragile construct because it is fundamentally difficult to earn and easily destroyed (Slovic, 1993). In addition, the results reflect that, overall, individuals trust their government and follow the government's strategies for managing a public health hazard. Hence, people perceive themselves to have firm personal control in the situation (Kasperson et al., 1992; Vaughan & Tinker, 2009). In contrast, individuals with a low level of trust exhibit a low level of self-efficacy, and such individuals are more worried, tense, and anxious because they cannot make the behavioral changes needed to protect themselves. However, individuals with a high level of trust in the government are likely to depend on their government for protection (Huurne et al., 2009). Thus, according to the confidence model, when people trust their government, the public is encouraged to accept the government's decisions and adopt the recommended protective measures (Siegrist et al., 2003; Slovic, 2000). Logically, in this context, trust in the government and self-efficacy are intertwined and valid (Griffin et al., 2008). Therefore, the current findings contribute to both knowledge and practice, especially regarding the importance of trust in the government during critical situations (e.g., the COVID-19 pandemic) (Paek et al., 2008).

Second, risk perception and perceived self-efficacy during the current pandemic are positively correlated. This relationship explains that people who perceive a high level of risk regarding COVID-19 are more likely to increase their individual self-efficacy beliefs. Thus, this finding is consistent with the theoretical proposition. In addition, individuals who perceive a high level of susceptibility to and a high level of severity of COVID-19 are likely to adopt behavioral changes and implement protective measures (El-Toukhy, 2015). Therefore, based on social motivation theory (SMT), people who perceive a high level of risk and have a high level of self-efficacy are viewed as responsive individuals who can adapt and implement protective health measures to ensure that their chances of becoming infected are low (Flora et al., 1997; Witte, 1992). Therefore, risk perception is an influential factor in self-efficacy, particularly during the current pandemic.

When considering satisfaction with government measures, the study data reflect the following interesting phenomenon: the relationship between trust in the government and self-efficacy is stronger when people are highly satisfied with government measures. This finding can be explained by the fact that individuals trust their government to protect them during the current pandemic. This trust enhances their belief in their ability to protect themselves from COVID-19, particularly when they are highly satisfied with government measures, making them more likely to comply with government measures during public health crises (Bandura, 1997; Siegrist et al., 2003). Similarly, as predicted, our results revealed a relationship between risk perception and self-efficacy. The analysis reveals the following exciting result: when individuals are highly satisfied with government measures, the relationship between risk perception and self-efficacy is strengthened; furthermore, such individuals are aware of their susceptibility to and the severity of the virus and are motivated to implement precautionary actions (self-efficacy) (Flora et al., 1997; Slovic, 2000). Specifically, the relationship is stronger when satisfaction with government measures is higher. Hence, this study sheds light on the importance of satisfaction with government measures during a pandemic and the critical role of satisfaction in shaping risk perception regarding COVID-19 and individuals' abilities to adapt their personal preventive measures (Rimal & Real, 2003; van der Weerd et al., 2011).

In conclusion, the study highlights the degree of trust Swedish citizens have in their government and their self-awareness of the risk of COVID-19. As indicated by the findings, the Swedish citizens surveyed in this study reported a high level of trust in their government to protect them during the pandemic and a high level of perceived risk from the COVID-19 virus, both of which enhance individuals' awareness of the risk posed by COVID-19. These factors enhance their belief in their ability to adopt the recommended

preventive measures and enact behavioral changes to combat the spread of COVID-19 in Sweden. Importantly, as revealed in this study, Swedish people are likely satisfied with the government measures implemented to combat the virus. In turn, their satisfaction with the government measures augments the positive effects of trust in the government and risk perception on self-efficacy. Therefore, the findings of this study are significant because they highlight that, although governments worldwide are implementing measures such as social distancing, nationwide lockdowns, and stay-at-home orders during the pandemic (Hussain, 2020), people's satisfaction with these government measures plays a critical role in the public's ability to protect itself and in shaping its trust in the government and how to perceive the risk of the threat.

## Limitations and Future Research

The first limitation of the current research is that sampling for the study was conducted via a convenience sample through researchers' networks and disseminated through different social media platforms (e.g., WhatsApp, Facebook, Twitter). As a result, the possibility of bias exists because disadvantaged populations might not have been able to participate in the study. Therefore, limitations also exist regarding the representativeness of the findings. A more systematic, inclusive sampling method is warranted to improve the representativeness and generalizability of the findings. A further limitation of the present study is the possibility that the participants provided socially desirable responses. Because this study used self-reported data, the participants might have answered the attitude and practices questions differently based on what they thought would be expected of them (Van de Mortel, 2008). Therefore, we urge academic scholars to perform more work using more longitudinal or experiential studies to examine the relationship between these variables to clearly observe the dynamic shifts in trust, risk, and self-efficacy. Finally, prior research indicated that the sources people use to obtain information regarding the pandemic, such as social media or official news outlets, considerably impact the cognitive issues of both individuals and groups (Tsui et al., 2020; Wiederhold, 2020). Thus, the structures examined here might be influenced by other factors or variables missing from this study, such as social media usage or exposure. Hence, the use and impact of social media during the COVID-19 crisis require further investigation (Hassan et al., 2020).

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## Declarations

**Availability Statement** The datasets generated and/or analyzed during the current study are available from the corresponding authors on reasonable request.

**Conflict of Interest** The authors declare that they have no conflicts of interest.

**Ethical Approval** This study was approved by the University of Malaya Research Ethics Committee (Approval No UM. TNC2/UMREC—967).

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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