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RESEARCH ARTICLE

Communicative Action in COVID-19 Prevention: Does Religiosity Play a Role?

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Abstract: Coronavirus disease (COVID-19) has presented the world with a major challenge in curbing infection. Information is important for public awareness of the pandemic and its prevention as part of the problem-solving efforts. Grounded on the situational theory of problem solving (STOPS), this study extends the theory by adding religiosity, an important factor that affects health-related behaviors, to examine its role as an antecedent to the situational perceptions that motivate people to take communicative action in preventing COVID-19, and to investigate the factors that lead to precautionary behavior in response to the pandemic. Based on the online survey responses from 371 respondents, the findings of the current study suggest that religiosity predicts problem recognition and constraint recognition, which further lead to communicative action in problem solving. Religiosity, however, does not predict involvement recognition. Religiosity and situational motivation were also found to be significantly related to precautionary behavior. The outcomes can serve as a guideline for the Malaysian Health Promotion Board in information dissemination during a pandemic.

Keywords: COVID-19, Situational Theory of Problem Solving (STOPS), religiosity, precautionary behavior, communicative action

Since the highly contagious Coronavirus disease, or commonly known as COVID-19, has rampantly affected the world by taking almost two million human lives in a year (WHO, 2021). Malaysia reported 180,455 cases and 667 deaths as of January 23, 2021 (Yusof, 2021). The impact of COVID-19 is far-reaching to the extent that the daily routine of people from all walks of life is affected after the Malaysian government has announced to implement the Movement Control Order (MCO) in the country to curb the pandemic (Povera & Yunus, 2020). Because

COVID-19 can be transmitted through humans (Chan et al., 2020), the situation will deteriorate if the public is not aware of the MCO directives and continues to perform high-risk behaviors such as going out freely and joining gatherings. Therefore, information regarding the COVID-19 and the prevention for the public is definitely indispensable during the pandemic.

Kim and Grunig (2011) argued that the public with situational perception on certain social or individual problems is likely to seek and attend to relevant information to communicate about those problems.

Voeten et al. (2009) claimed that updated and accurate information is intended to ensure that the public is well informed of the current situation. Wong and Sam (2010) agreed that information increases their awareness of the problem, helps alleviate their fear, and encourages them to take precautionary measures. However, information overload may be an obstacle to effective communication (Locatelli et al., 2012), especially on social media such as Facebook, which may be a useful platform for sharing information, but also fake news stories that mislead the public may be more popular than the real information (Sharma et al., 2017). This has been a concern in Malaysia, especially during the pandemic, because it is difficult to control misinformation that could interfere with the dissemination of accurate information (Parzi, 2020). Thus, it is imperative to study the factors that motivate the public to take communicative action in which people search for and disseminate accurate information related to COVID-19 in an effort to curb the spread of the pandemic.

In addition, the linkage between religiosity and health has long been acknowledged (Southwell, 2011). Recently, researchers across the globe also started paying attention to the impacts of religion in the context of the COVID-19 pandemic; they examined the influence of religiosity on physical and mental health (Counted et al., 2020; Lucchetti et al., 2020; Minton & Cabano, 2021; Pirutinsky et al., 2020), but the role of religiosity in leading to communicative action such as health information sharing has been underexplored (Southwell, 2011). Besides that, past studies also discovered inconsistent relationships between religiosity and precautionary behavior in the pandemic (Hill et al., 2020; Perry et al., 2020). To address the research gap, this study is initiated (a) to examine the role of religiosity as an antecedent to the situational perceptions that motivate people to take communicative action in preventing COVID-19, and (b) to investigate the factors that lead to precautionary behavior in response to the pandemic.

Literature Review

Situational Theory of Problem Solving (STOPS) as a Theoretical Framework

STOPS explains the factors that motivate a person to become an active problem solver and how they

solve a problem via communicative action (Kim & Grunig, 2011). This theory has been applied in various contexts, such as the crisis of public health (Chon & Park, 2021), employability (Hashim et al., 2014), organ donation (Kim et al., 2011), and sex crime (Shin & Han, 2016). According to the STOPS, three perceptual factors, known as situational perceptions, motivate an individual to become active in problem-solving: problem recognition, constraint recognition, and involvement recognition (Grunig, 1997; Kim & Grunig, 2011).

Problem recognition happens when someone recognizes a problem by realizing the gap between the expected state (e.g., healthy society) and experiential state (e.g., public health crisis) but does not find a way to resolve the problem (Kim & Grunig, 2011). Constraint recognition is a barrier that prevents someone from doing anything about the problem; the public will not communicate about the problem if they feel that they are incapable of doing anything about the situation (Grunig, 1997). In contrast, involvement recognition refers to the perceived link between people and the problematic situation (Grunig, 1997). People will actively search for information and discuss the issue with others if they recognize the link between the problem and themselves (Grunig, 1976).

However, STOPS proposes that situational motivation in problem solving should be considered before moving from the perceived state (e.g., situational perceptions) to information behaviors (e.g., communicative action). The situational motivation in problem-solving is, according to Kim and Grunig (2011, p. 132), defined as “a state of situation-specific cognitive and epistemic readiness” to make a solution to problems. Theorists suggested that this motivational variable helps the public identify something to be done instead of thinking about what to do (Kim & Grunig, 2011).

According to STOPS, people can solve a problem using communicative action. Kim and Grunig (2011) defined communicative action as the behaviors of problem solvers in acquiring, disseminating, and choosing information when dealing with a problem. The three active behaviors of communicative action are information seeking, information forwarding, and information forefending. Information seeking happens when people intend to search for information, news, and opinions on an issue instead of waiting for others to provide the information. Information forwarding

means providing information on an issue actively and voluntarily to others. Information forefending occurs when people do not simply accept all information but filter it by assessing its value and relevance, especially when the information is overloaded. The theory suggests that, when individuals are motivated to solve a problem, they tend to actively seek and forward information, as well as to be selective in the use of information (Chen et al., 2017).

Inclusion of New Constructs in STOPS

Although STOPS suggests the three situational perceptions (e.g., problem recognition) as factors that motivate communicative action in problem solving, other cross-situational factors, depending on different problematic situations, that could possibly influence the public's situational perceptions are worth to be explored (Kim et al., 2012). This has been proven by the previous studies whereby insightful findings were obtained when new constructs such as demographics, political interest, protest participation, health consciousness, and government trust were included as antecedents to the situational perceptions in the STOPS research (Chen et al., 2017; Kim et al., 2012; Zheng & McKeever, 2016).

In the past, many studies have been looking at the role of religiosity in the problem-solving process. Religiosity has always been significantly affecting family relationship problems (i.e., husband-wife relationship; Sullivan, 2001), social issues (Button et al., 2010; French et al., 2019; Mutti-Packer et al., 2017; Noon et al., 2003), and disaster (Lim et al., 2019). In a health context, You et al. (2019) studied the influence of religiosity in dealing with mental health. The abovementioned studies showed that religiosity is an important antecedent in different types of problem-solving scenarios. In addition, recent studies have begun to incorporate religiosity into the theoretical model (Bautista et al., 2020; Hameed et al., 2019). Although religion influences one's perception (McAuley et al., 2000), to the authors' best knowledge thus far, there are no studies exploring religiosity in the STOPS theoretical framework. Hence, this study extends STOPS theoretical framework by including religiosity as an antecedent to the situational perceptions.

Besides that, this study explores both communicative action and non-communicative action (i.e., precautionary behavior) when dealing with the

pandemic. Extensive past studies have confirmed that individual's religiosity predicts their different preventive behaviors on health problems such as obesity (Ansari et al., 2017; Bruce et al., 2016), Human immunodeficiency virus or HIV (McCree et al., 2003), and diabetes (Bhattacharya, 2013). The findings corroborated the correlation between religiosity and precautionary behavior. Hence, it is relevant to include precautionary behavior in the current research framework.

Relationships between STOPS Constructs

STOPS suggests that problem recognition and involvement recognition are positively related to situational motivation in problem-solving, whereas constraint recognition is negatively related to situational motivation in problem-solving (Kim & Grunig, 2011). In other words, people will be motivated in problem-solving when they have high problem recognition, low constraint recognition, and high involvement recognition (Kim & Grunig, 2011). The relationships between situational perceptions and situational motivation in problem-solving have been supported by past researchers (Li et al., 2019; Ouyang et al., 2020; Zheng, 2020). In the present context, people who perceive COVID-19 as a threat to health feel the connection between the pandemic and themselves, as well as do not see anything that limits their ability to do something about the pandemic will often think about and be interested to know the pandemic. Therefore, this study proposes the following hypotheses:

- H1: Problem recognition is positively related to situational motivation in problem-solving.
- H2: Constraint recognition is negatively related to situational motivation in problem-solving.
- H3: Involvement recognition is positively related to situational motivation in problem-solving.

In health communication, an active problem solver is motivated to seek and forward information, as well as be cautious in seeking and forwarding information. Krishna (2018) found that people are active in information acquisition, dissemination, and selection

in the context of the anti-vaccine movement. Chon and Park (2021) also found that people with situational perceptions of an infectious disease are more likely to obtain and transmit information from the Centre for Disease Control and Prevention. Given the assumptions of STOPS, the current study predicts that the public will take the initiative to search for information about COVID-19 (e.g., preventive measures, number of cases, etc.) from reliable sources, and share with others if their situational motivation is high. Thus, this study formulates the following hypotheses:

- H4: Situational motivation in problem-solving is positively related to information seeking.
- H5: Situational motivation in problem-solving is positively related to information forwarding.
- H6: Situational motivation in problem-solving is positively related to information forefending.

Religiosity

According to Koenig et al. (2001, p. 18), “religion involves beliefs, practices, and rituals related to the transcendent, where the transcendent is God, Allah, HaShem, or a Higher Power in Western religious traditions, or to Brahman, manifestations of Brahman, Buddha, Dao, or ultimate truth/reality in Eastern traditions,” whereas religiosity refers to the degree that a worshipper believes in God and is committed to behave and act in accordance with God’s rules (McDaniel & Burnett, 1990).

Religiosity has received attention from scholars in the studies pertaining to the COVID-19 pandemic. Kranz et al. (2020) studied the relationships between religiosity, COVID-19 anxiety, and preventive behavior. Minton and Cabano (2021) found that religious consumers tend to exhibit deeper concern about the pandemic and be more active in purchasing behavior to seek stability than less or non-religious consumers. Koenig (2020) even suggested that strengthening religious faith may help one maintain spiritual and mental resilience during the pandemic. Others discovered that religious coping provides mental health benefits and reduces the risk of a depressive illness during the pandemic (Pirutinsky et al., 2020; Thomas & Barbato, 2020).

According to Singhapakdi et al. (2000), there is a positive relationship between religiosity and perception of a problem. This is due to the strong influences of religiosity in the evaluation of a situation (Clark & Dawson, 1996). A study conducted by Yeterian et al. (2015) on adolescents that identified alcohol or other drugs as a problem found out that religiosity has an influence on problem recognition. The experimental research showed that adolescents who are more religious perceive alcohol or other drugs as a problem compared to the less religious respondents.

On the other hand, prior studies showed that religiosity is associated with the belief in one’s ability to deal with a situation. For instance, Cuevas et al. (2019) found that religiosity predicts self-efficacy among people with hearing impairment. A positive correlation was also discovered among the Filipino elderlies who are religious and believe in their capability in achieving their goals (de Guzman et al., 2015). In Kuwait, Abdel-Khalek and Lester (2017) explained that religious college students possess positive traits such as mental health, happiness, and self-efficacy because religion is a source of strength and hope in their lives. Similarly, with the COVID-19 pandemic, Kowalczyk et al. (2020) agreed that religion allows people to uphold hope to carry on their lives and enables them to control the situation. In short, the more religious the people are, the fewer obstacles they have when facing COVID-19. Based on the past studies, this study posits the following hypotheses:

- H7: Religiosity is positively related to problem recognition.
- H8: Religiosity is negatively related to constraint recognition.

Furthermore, it is essential to examine whether involvement recognition is affected by an individual’s religiosity. Nonetheless, the effect of religiosity on the connection between people and problem, especially the public health crisis, is yet to be clearly identified. Thus, the following research question is formulated:

- RQ1: What is the effect of religiosity on involvement recognition?

Precautionary Behavior

It is advisable to take precautionary measures to prevent infection before any vaccine is developed. The World Health Organization (WHO) has prepared the guidelines for fighting the disease, and the Health Department in each country has also outlined steps for virus prevention; for example, general sanitation checking, community infection-control measures, social distancing and quarantine, and restrictions of travel and trade (WHO, 2020).

The impact of religiosity on human behavior has been extensively discussed with competing findings in health-related behavior. Some studies have found that religiosity does not play a role in health-related behavior (Meng et al., 2016; Ritchwood et al., 2017; Stephenson et al., 2008). Others showed that religiosity is vital in affecting health-related behavior and problem-solving process (You et al., 2019). Religiosity was also found to be significantly affecting preventive behavior of pregnancy (McCree et al., 2003). In the COVID-19 context, Perry et al. (2020) found that religious people are more likely to wash hands, wear a mask, and avoid touching their faces. Similarly, past studies have shown that motivation is significantly associated with behavior (Andersson & Johannsen, 2016; Panuwatwanich et al., 2017). Therefore, the following hypotheses are proposed:

- H9: Religiosity is positively related to precautionary behavior.
- H10: Situational motivation in problem solving is positively related to precautionary behavior.

Methods

This study employed a quantitative approach in which a cross-sectional survey was used to examine the proposed hypotheses. A questionnaire was developed to collect the data using the network sampling method. Network sampling, also known as snowball sampling, starts the recruitment of a sample with a modest number of initial respondents in which the second batch of sample is derived from initial respondents' network connections (Wejnert & Heckathorn, 2008). The method has been used to reach a highly dispersed

population in the past (Apuke & Omar, 2021). In the current study, the online questionnaire using Google form was sent to the respondents through Facebook and WhatsApp. They were requested to forward the Google link to the members of their network. The data collection was conducted from April 3 until April 13, 2020 during the MCO period in Malaysia, where physical data collection was prohibited. The study targeted Malaysian adults aged 18 and above as they are considered having mature thinking (Hirschmann, 2019; Liitos et al., 2012). A total of 376 questionnaires have been collected. Five responses from those under 18 years old and without religion were excluded.

Questionnaire Development

A bilingual questionnaire (i.e., English and Malay) was designed to measure the constructs of this study. The first section of the questionnaire included demographic questions such as sex, age, ethnic group, and religion.

The second section measured the constructs from STOPS by adapting the items from Kim and Grunig (2011). We employed three items for each construct: problem recognition (e.g., "I think COVID-19 is a serious social and national problem"), constraint recognition (e.g., "I cannot improve the problematic situation of COVID-19 by advising others to take precautionary action"), involvement recognition (e.g., "I think COVID-19 can affect my life"), and situational motivation in problem-solving (e.g., "I would frequently think about the problems of COVID-19"). Likewise, three items were used to measure each communicative action: information seeking (e.g., "I regularly check to see if there is any new information about COVID-19 on the Internet"), information forwarding (e.g., "I believe raising the topic of COVID-19 among the people I know is important"), and information forefending (e.g., "I am careful in accepting information regarding COVID-19"). All items were measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

The third section consisted of four items for religiosity. The construct was measured using items adapted from Reiland and Lauterbach (2008) as they covered different dimensions of religiosity (e.g., belief, commitment, and behavior). The nature of the measurement items, which is not skewed towards any

particular religion, is appropriate for the context of multi-religions in Malaysia. One of the items was, "In general, religious or spiritual beliefs are important in my daily life." Similar to the second section, all items were measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

The last section measured the precautionary behavior derived from the preventive measures suggested by the WHO and the Malaysian Ministry of Health (*Coronavirus disease (COVID-19) advice for the public*, 2020). There were three items used to measure the construct. One of the questions was, "I rarely go out to avoid COVID-19 infection." A 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was utilized in this section as well.

Results

Respondents' Profile

This study used IBM SPSS Statistics 22 for descriptive analysis and AMOS 23 to examine the structural relationship between the constructs. Of the 371 respondents, there were more females (60.6%) than males (39.4%). The sample covered a wide range of age groups ranging from 18 to 69 years old, most of which were between 31 to 40 years old (39.4%), followed by ages ranging from 21 to 30 (29.1%) and 41 to 50 (12.9%). Approximately 35.3% of the respondents were Malay, followed by Chinese (32.6%), Indian (16.7%), as well as Sabah and Sarawak natives (12.9%). In addition, 41.8% of them were Muslims, followed by Buddhists (26.4%), Christians (15.6%), and Hindus (14.8%).

Measurement Model

A two-step approach was run to ensure reliability and validity. CFA was conducted to check the construct reliability, convergent, and discriminant validity before running structural equation modeling (Anderson & Gerbing, 1992). After one item was deleted from problem recognition, situational motivation in problem-solving, and information forefending due to low factor

loading, the results were as follows: $\chi^2/df=1.762$, root mean square error of approximation (RMSEA) of .046, goodness-of-fit index (GFI) of .910, standardized root mean square residual (SRMR) of .047, comparative fit index (CFI) of .950, and incremental fit index (IFI) of .951. As shown in Table 1, standardized factor loading (SFL) ranged from 0.52 to 0.94. The average variance extracted (AVE) of these constructs ranged from 0.44 to 0.71. The reliability value of all constructs ranged from 0.61 to 0.89. In sum, the scales of this study were reliable and valid (Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Hu & Bentler, 1999).

Structural Model

The model's fit indices of the estimated structural model were as follows: $\chi^2/df = 1.667$, RMSEA = .042, GFI = .915, SRMR = .056, CFI = .959, IFI = .959. Problem recognition ($\beta = .27$, $p < .01$) was positively related to situational motivation in problem solving, and constraint recognition ($\beta = -.47$, $p < .001$) was negatively related to situational motivation in problem solving, supporting H1 and H2. However, involvement recognition was not significantly related to situational motivation in problem-solving ($\beta = .07$, $p > .05$); therefore, H3 was rejected. Situational motivation in problem-solving showed a positive relationship with information seeking ($\beta = .87$, $p < .001$), information forwarding ($\beta = .86$, $p < .001$), and information forefending ($\beta = .74$, $p < .001$), supporting H4, H5, and H6. Religiosity appeared to be positively related to problem recognition ($\beta = .18$, $p < .05$) and negatively related to constraint recognition ($\beta = -.40$, $p < .001$), supporting H7 and H8, but did not have a significant effect on involvement recognition ($\beta = .07$, $p > .05$). In addition, religiosity ($\beta = .18$, $p < .01$) and situational motivation in problem-solving ($\beta = .43$, $p < .001$) were positively related to precautionary behavior, and H9 and H10 were supported. The results were shown in Figure 1.

Table 1*Confirmatory Factor Analysis Results*

Construct	Mean	SD	SFL	AVE	CR
Problem Recognition				0.44	0.61
I think Covid-19 is a serious social and national problem.	4.78	.55	0.67		
Something needs to be done to stop Covid-19 from being widespread.	4.93	.27	0.65		
Constraint Recognition				0.56	0.79
I cannot do anything to prevent Covid-19.	1.60	.83	0.75		
I cannot improve the problematic situation of Covid-19 by advising others to take precautionary action.	1.60	.76	0.82		
My opinion would not change public opinion on Covid-19.	2.31	1.01	0.66		
Involvement Recognition				0.57	0.79
I think Covid-19 can affect my life.	4.66	.63	0.89		
I think Covid-19 can affect me and those I care about.	4.67	.64	0.81		
I think Covid-19 is relevant to most people, including me.	4.57	.77	0.52		
Situational Motivation in Problem Solving				0.56	0.71
I would frequently think about the problems of Covid-19.	3.99	.99	0.73		
I would like to better understand the impacts of Covid-19 on society.	4.41	.75	0.76		
Information Seeking				0.71	0.88
I actively search for information about Covid-19 using different ways.	3.96	1.01	0.82		
I regularly check to see if there is any new information about Covid-19 on the Internet.	4.22	.93	0.84		
I search for information about Covid-19 from any sources that are available to me.	4.09	.97	0.86		
Information Forwarding				0.58	0.81
I love to start a conversation about Covid-19 with others.	3.45	1.13	0.74		
I believe raising the topic of Covid-19 among the people I know is important.	4.14	.92	0.84		
I make sure that my friends know about Covid-19.	4.31	.86	0.70		
Information Forefending				0.69	0.82
I have a selection of trusted sources that I check for updates on Covid-19 in Malaysia.	4.27	.84	0.78		
I am careful in accepting information regarding Covid-19.	4.55	.65	0.88		
Religiosity				0.68	0.89
In general, religious or spiritual beliefs are important in my daily life.	4.36	.99	0.77		
I often attend religious services.	3.16	1.25	0.62		
When I have problems or difficulties in my family work or personal life, I often seek spiritual comfort through religion.	3.84	1.26	0.94		
I often seek religious guidance when I make a decision in my daily life.	3.80	1.30	0.92		
Precautionary Behavior				0.46	0.71
I rarely go out to avoid Covid-19 infection.	4.72	.61	0.67		
I clean my hands regularly with soap or sanitizer.	4.60	.65	0.73		
I practice social distancing when I am outside.	4.72	.55	0.62		

Note: SD = standard deviation; SFL = standardized factor loading; AVE = average variance extracted; CR = construct reliability.

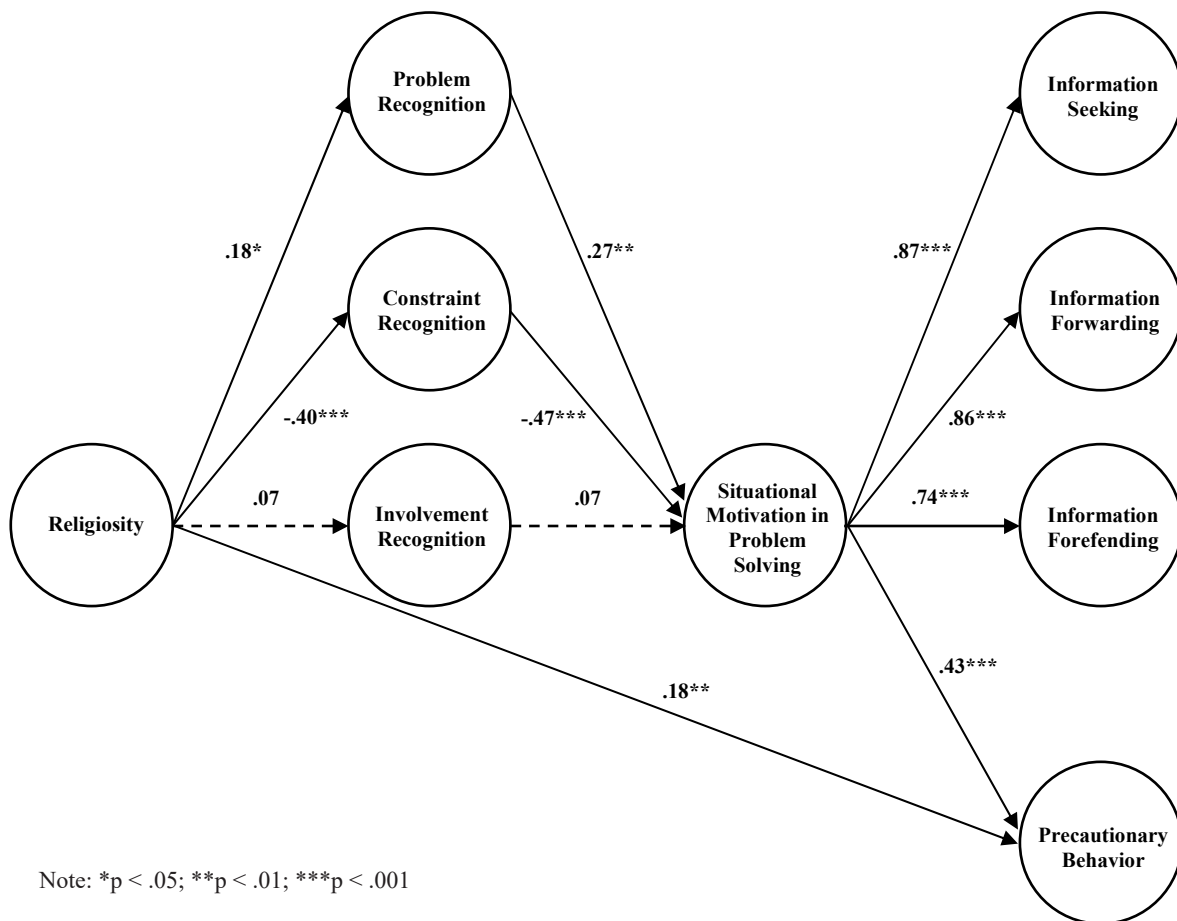


Figure 1. The Results of the Proposed Model

Discussion

In line with the assumptions of STOPS, problem recognition and constraint recognition contribute significantly to situational motivation in problem-solving, indicating that individuals who perceive COVID-19 as a threat and think that nothing limits their ability to do anything about the pandemic show higher motivation in problem-solving. On the contrary, the result does not support the hypothesized significant relationship between involvement recognition and situational motivation. This could be attributed to the lower severity of the pandemic during the data collection, which was at the early stage of MCO and the COVID-19 clusters did not spread widely yet. Thus, participants did not pay much attention to the issue as they were unaware of their impacts. Another possible reason is that the public lacked interest in the public health crisis; therefore, whether or not COVID-19

affects them or their loved ones, it does not motivate them to look for more information or discuss the topic with others.

The result supports that situational motivation is positively related to information seeking, forwarding, and forefending. This is consistent with the past studies (Kim et al., 2011; Li et al., 2019; Shin & Han, 2016). When people keep thinking about COVID-19 problems and want to understand the pandemic better, they will be searching for information such as the mortality statistics, precautionary steps, and other government announcements on the pandemic. They will also take the initiative to tell their family about the latest updates on COVID-19 or to share the information with others through phone calls or social media. In addition, they will be selective in choosing a platform of news resources to ensure the reliability of the information. Internet users may only turn to reliable websites such as online news portals or e-newspaper for information

instead of believing any information on COVID-19 shared by friends in the social media post without an identifiable source of information.

Religiosity is incorporated in the STOPS theoretical framework as an antecedent to situational perceptions. Consistent with the previous studies (Abdoli et al., 2011; Singhapakdi et al., 2000), the findings of this study have shown that religiosity has a significant impact on problem recognition and constraint recognition. Individuals who are highly devoted to a religion are guided by their religious beliefs about the way one should live (Hwang, 2018). In view of the current situation in which the majority of people's lives are largely affected by COVID-19, religious people may be more likely to recognize such a situation as a problem. This explains the positive relationship between religiosity and problem recognition in this study. The negative relationship between religiosity and constraint recognition found in this study is consistent with the research conducted by Abdoli et al. (2011), who found that people show confidence in their ability to overcome their disease when they have the support from God. This shows that having a strong faith in religion empowers them to continue to hope in the future.

However, religiosity did not appear to be significant with involvement recognition. A possible reason is that there might be divergent perceptions of COVID-19 among the religious people in terms of the possibility of themselves being infected. Many worshippers joined religious congregation during the pandemic period as they were more afraid of God than the virus (Allard & Costa, 2020), but there were also devotees who perceived the disease to be highly dangerous to them and suggested that the government should have canceled the religious gathering to ensure the safety of the pilgrims (Ananthalakshmi & Sipalan, 2020).

Our findings also showed that religiosity has a significant impact on precautionary behavior and is in line with the study conducted by Riazi et al. (2017). Besides religiosity, situational motivation in problem-solving is found to be significantly related to precautionary behavior as well. This is consistent with Balami et al.'s (2019) study on insecticidal net use, where motivation appeared to determine behavior. Several actions will be taken by people who are cognitively prepared to stop the pandemic, such as taking hygiene measures, keeping distance from others, wearing masks, avoiding gatherings, and so on.

Implications

There are some theoretical contributions to this study. First, this is the pioneering study integrating religiosity in public relations theory in solving the health-related issue. Past researches have been studying religiosity by using social psychology theories such as the health belief model, social cognitive theory, and theory of planned behavior (Chin & Mansori, 2019; Noar et al., 2015; Shafer et al., 2018) in the health context. Limited studies have actually applied communication-related theory with religiosity in solving health-related communication issues. STOPS, a public relations theory, has been applied in health communication, but human spiritual belief is rarely studied as a factor influencing one's health communicative action. By incorporating religiosity as an antecedent to situational perceptions, which lead to problem solving in health communication, the current study not only contributes to the theoretical implications by adding new insight to the existing health communication literature but also to the body of knowledge in the study of religion.

Second, STOPS stresses communicative action in dealing with the problem. The antecedents to communicative action have rarely been used to predict non-communicative action. This study extends the theory by adding a non-communicative action (i.e., precautionary behavior) to examine the predictors of this new construct.

Third, religiosity has been studied in mono religious countries in the past; however, the data for this study was collected from a multicultural and multi-religious country. Past studies either focused on Christian or Catholic majority religion or Islamic majority countries. Thus, the present study advances the previous literature by providing new findings for religiosity concept where it was applied in the context of multi-religions.

In terms of practical implications, this study benefits the government in understanding the factors that motivate the public to select, search for, and share the latest pandemic information provided by the Malaysian Health Promotion Board and to take precautionary behavior during a pandemic. This subsequently assists the authority in designing messages in a manner that places more emphasis on the impact of a pandemic (increase problem recognition) and enhances the public's self-efficacy in dealing with the crisis (reduce constraint recognition). Besides that, religious leaders

can play a role in problem-solving because this study also sheds light on one's religiosity in the problem-solving effort. Religious leaders are among the crucial influencers in affecting their followers' religious practices. Advice from religious leaders could be very influential in guiding the followers to tackle their situational problems. Based on the findings of this study in which religiosity is significantly related to problem recognition and constraint recognition, religious leaders can help increase the followers' realization of the impact of the pandemic and alleviate the obstacles that hinder them from doing anything about the problem. The Malaysian Health Promotion Board can also work with religious organizations by appointing key religious leaders as opinion leaders in disseminating the information to the followers and encourage them to comply with the authority's directives.

Limitation and Recommendation

The study only examined religiosity as a single antecedent to situational perceptions and precautionary behavior. There might be other possible factors influencing both constructs; therefore, future study is recommended to consider other constructs such as social influence, peer support, and personality in the problem-solving process. In addition to its role as an antecedent, religiosity can be considered as a moderator in a research model of future research. Lastly, the current research examined religiosity as a whole regardless of Islam, Buddhism, Hinduism, or Christianity. It is suggested that future research compares the problem-solving mechanism of different religions due to Malaysia's multi-religious society.

Declaration of ownership

This report is our original work.

Conflict of interest

None.

Ethical clearance

This study was approved by our institution.

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