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Fatalistic beliefs and risk-taking on the covid-19 pandemic: Effect of level of study

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ABSTRACT: The objective of this research was to study the relationship between fatalistic beliefs, level of study and risk-taking of Cameroonians vis-à-vis COVID-19. Indeed, this pandemic that appeared in China towards the end of 2019 causes thousands of deaths around the world. In Cameroon, despite the many measures enacted by the Government, statistics indicate an evolution in the number of cases (nearly 20,000 cases, MINSANTE, 2020). Using the simple random sampling technique, 219 participants aged 18 to 63 were asked to complete a composite questionnaire (fatalistic belief scale, Shen et al., 2009; Protection Motivation Theory Scale, Rogers, 1973, sociodemographic variables). The results from the analysis of variances, correlations and regressions confirm our hypotheses. Overall, it is observed that the level of study influences fatalistic beliefs (F (2.115) = 5.83, p =.004) and risk-taking (F (2.115) = 9.29, p =.001). On the other hand, fatalistic beliefs explain the risk-taking vis-à-vis COVID-19 [r (219) = 0.175, p < 0.01; β = 0.175, t (217) = 2.613, p = 0.010, F (2.217) = 6.826, p = 0.010)]. Such results show the place of certain socio-demographic variables and fatalistic beliefs and the need to take them into account when addressing the issue of safety behavior.

KEYWORDS: Fatalistic beliefs, COVID-19, safety behaviors, prevention.

1 INTRODUCTION

The outbreak of the Covid-19 pandemic in China towards the end of 2019, has caused thousands of deaths worldwide and is a real public health concern. It generates substantial costs and is a burden, an economic brake for all societies (WHO, 2020; www.who.int/). There are approximately 11,797,213 cases of contamination with 6,415,379 cured and 543,595 deaths worldwide (WHO, 2020; www.who.int/). In the United States, for example, there are approximately 3,048,072 confirmed cases with 918,298 recoveries and 133,322 deaths. In Brazil, there are approximately 1,674,655 confirmed cases with 1,072,229 recoveries and 66,868 deaths. In India, there are approximately 2,647,663 confirmed cases with 1,919,842 recovered cases and 50,921 deaths. In Russia, there are about 694,230 confirmed cases with 463,880 recoveries and 10,494 deaths. In Egypt, there are about 77,279 confirmed cases with 21,718 cases of recovery and 3,489 deaths. In South Africa, there are approximately 215,855 confirmed cases with 102,299 recoveries and 3,502 deaths. In Kenya, there are approximately 8,067 confirmed cases with 2,414 recoveries and 164 deaths. In Cameroon, figures indicate about 18,118 confirmed cases with 16,540 recoveries and 401 deaths. Given the significant costs generated by the rise in the number of cases, the prevention of this pandemic has become a real concern for public authorities and the scientific community.

In general, human behavior very often comes back at the top of the list of factors mentioned to explain the insecure behavior of individuals (Chow & Mullan 2010; Clayton & Griffith, 2008; Milton & Mullan, 2012; Mullan & Wong, 2009; Yiannas 2009; Wright & Leach, 2013). The risks associated with non-compliance with barrier measures are one of the first risks for contamination because of their frequency. It is important to note that, for an individual to agree to respect barrier measures, he must first accept that the disease exists and that he is vulnerable. The concept of risk acceptability, the definition and determinants of which are not yet consensual, uses the perception of risks by the various actors but also their perception of barrier measures and risk management policy (Kouabenan, 1998). This brings to light the idea that changing behavior could go a long way towards reducing the number of infections linked to this pandemic.

Numerous studies highlight two major cognitive processes that underpin the adoption of protective behavior. This is the perception of risk (Kouabenan et al., 2006; Slovic et al., 1981) and the explanation of events (Kouabenan 1999). Kouabenan (2009) explains, for example, that these two cognitive processes have in common the fact that they are based on the representations and beliefs of

individuals, which beliefs can directly affect behaviors. Fatalistic beliefs (Claassen et al., 20l0; Kouabenan, 1998; Norenzayan & Lee, 2010; Omari & Baron-Epl, 2013; Ttirkiim, 2006), beliefs of control (White et al., 2006), beliefs in God's control (Howsepian & Merluzzi, 2009; Ngueutsa, 2012) and cultural beliefs are the increasingly studied forms of belief in social psychology. Taking into account beliefs thus becomes a widely used approach to better understand health and safety issues, and to define more effective and sustainable preventive actions (Bergvik et al., 2012; Kayani et al., 2012; Kouabenan 1998; Ngah Essomba, 2012; Sloan et al., 2009; Weinstein 1993). Among these forms of belief, fatalistic beliefs are presented in different models of adoption of protective behaviors as being able to directly affect insecure behaviors (Gouertoumbo Mete, 2019; Kouabenan, 2009; Mvessomba et al., 2017; Nguetsa & Kouabenan, 2014). They refer to an individual's belief that death is inevitable in case of grave danger (Powe & Jonhson, 1995). According to Mvessomba et al. (2017) and Ngah Essomba et al. (2022a), fatalism is a doctrine based on a belief or set of beliefs that denies the individual the ability to act on events, especially future ones. Whatever security measures he adopts, it will have no impact on what needs to happen to him. It's all about chance or luck or divine control and can be easily explained by theology or metaphysics (Mvessomba et al., 2017; Ngah Essomba et al., 2022a). The fatalist refuses the ability to deliberate on what will happen, he believes that even his own behavior does not depend on him.

Fatalism therefore leads to a type of information processing characterized by denying personal control (Neff & Hoppe, 1993) and the belief that death is inevitable in case of serious danger (Powe et al., 2005). It highlights one or all three dimensions: the individual perceives the lack of internal control over the events of his life (Chavez et al., 1997; Davison et al., 1992; Neff & Hoppe, 1993; Straughan & Seow, 1998); notions of fate, fate and predestination of an unfortunate problem or event (Cohen & Nisbett, 1998; Davison et al., 1992; Straughan & Seow, 1998) and perceptions of helplessness, despair, and insignificance due to expectations of negative consequences (Sheier & Bridges, 1995; Powe & Johnson, 1995).

It can therefore be said that the processing of the fatalist's information leads him to make external attributions on life events such as the contamination of COVID-19. Hence the pre-eminence of the concepts of predestination, luck and pessimism among most researchers who describe the conduct of the fatalist (Shen et al., 2009). Such attitudes are likely to influence behavior and cause the individual to make no effort to comply with safety measures, i.e. not be motivated to protect himself. Shen et al. (2009), in their work, highlighted the fact that fatalism is a multidimensional construct, composed of predetermination, luck and pessimism. Predetermination is a belief in a world predefined by the divine order, where a pandemic like COVID-19 is perceived as a punishment from God. Luck is a belief that tends to consider everything that happens to an individual as a matter of fate, chance or fate. Therefore, if you are to be infected with COVID-19, no matter how hard you try, you have to be lucky to be spared. Pessimism, on the other hand, is the belief that people's behaviors will not prevent anything and that contamination from a pandemic like COVID-19 is inevitable. Let us also note with Maercker et al. (2019) that fatalistic beliefs are universal. They are accentuated by a very high exposure to health information through the media and promote the adoption of inappropriate behaviors to fight diseases such as cancer, cardiovascular diseases, HIV/AIDS, etc. (Lee & Chae, 2016; Maercker et al., 2019; Mvessomba et al., 2017).

Much research has focused on the influence of fatalistic beliefs on the behaviors of individuals. For Powe and Winnie (2003), fatalistic beliefs lead to the rejection of the adoption of changes in cancer behavior. Other studies show that fatalistic people tend to neglect respect for protective behaviors towards cardiovascular disease (Urizar & Sears, 2006); diabetes (Egede & Bonadonna, 2003); extreme stress (Yeh et al., 2006; Zimrin, 1986); HIV/AIDS (Varga, 2001); cigarette consumption (Schnoll et al., 2002); safe behaviors on the road (Gouertoumbo Mete, 2019; Ngah Essomba, 2017; Rudmo & Hale, 2003) and even healthy sexual practices (Kalichman et al., 1997). The objective of all this research briefly mentioned was to show the need to eliminate fatalistic beliefs to maximize the likelihood of adopting safe behaviors and at the same time reduce risk-taking among individuals. However, few studies have tested the link between fatalistic beliefs and risk-taking in the context of a health crisis. The fact that the fatalist feels that he has no power over what happens to him risks leading him to a biased perception of the causes of events, which would not allow the adoption of precautionary measures and would lead to risk-taking. To this end, we therefore formulate in the context of this research the hypothesis that fatalistic beliefs induce risk-taking vis-à-vis Covid-19. In an attempt to explain the effect of these beliefs on protective behavior, the model of health beliefs and the theory of motivation for protection are regularly convened.

The Health Belief Model (HBM), which has its origins in the - theory developed by Watson (1930), shows that individuals take risks because their beliefs filter or amplify risk. This model is based on perceived vulnerability, perceived threat, perceived severity, effectiveness of recommendations and the ability to implement preventive measures. It can then be said that individuals who take risks rely on beliefs that do not allow them to assess them objectively (Mvessomba et al., 2017). HBM is often used as a support for the explanation and development of prevention strategies.

The Motivation to Protect model (Rogers, 1983) was developed to study the conditions and factors that may cause individuals to protect themselves by engaging in safe behaviors. This model is based on perception and evaluation. It is actually the perception of vulnerability, the severity of the threat, the effectiveness of the recommendations, the ability to put into practice the recommendations (the barrier measures to deal with COVID-19). For Rogers (1983), the individual will engage in risky behavior (e.g. not wearing a protective mask), if he considers the costs (masking his beauty, personal beliefs, etc.) above the benefits. It is a question of an individual making a

deliberate choice of the means that allow him to achieve the intended objectives so that individual efforts are made according to a cost-benefit approach. If the individual finds that the behavior he seeks to adopt (wearing a mask or washing hands) will be beneficial for him, he will adopt it; otherwise, it will not adopt it. In relation to the COVID-19 pandemic, if the individual finds that compliance with barrier measures allows him to avoid the disease, he will respect them; but if, on the other hand, he finds that he will waste time and energy unnecessarily by respecting these measures, he will not respect them. Rogers (1975) explains that the adoption of safe behavior is a combination of three variables (the probability of occurrence of the threat or vulnerability; the severity of the threat; the effectiveness of the recommendations) that are likely to arouse motivation for protection. This awakening of motivation is likely to promote the adoption of the recommendations proposed by a prevention message. For example, an individual will comply with barrier measures if the message persuades him that he may be contaminated in case of non-compliance with these measures (vulnerability) and that he may be in respiratory distress following COVID-19 (severity) or that an effective way to avoid COVID-19 is to comply with these measures (effectiveness of the recommendation).

The originality of PMT is that it has succeeded in highlighting the complex nature of the cognitive processes of a threat (to health) (Ngah Essomba, 2017). With this in mind, health messages must be conceived as appeals to fear that would lead to the adoption of preventive behavior. TMP shows that the degree of motivation to protect oneself results from two parallel cognitive information processes in response to a health threat: the assessment of the threat and the evaluation of measures to deal with it. The development of motivation to protect oneself depends on the conditions and factors that prevent and promote health behaviors. The ambition of this research is therefore to highlight the relationship between fatalistic beliefs and compliance with security measures in the context of a health crisis (hypothesis 1).

Another point in this work concerns a third variable that is discussed here: the level of study. Some studies on the relationship between fatalistic beliefs and risk-taking add culture as a third variable. From this perspective, it appears that risk-taking varies according to the cultures specific to certain nationalities. For example, for Sivak et al. (1989b), Germans are more cautious during a road crossing than Americans and Spaniards. In addition, some studies show that people from different countries have perceptions and attitudes towards risk that more or less reflect the ways of thinking and living specific to their cultural environment (Vaughan & Nordenstan, 1991). This study addresses the level of education as a new variable in this field. This variable is operationalized based on the primary, secondary and university model as practiced in Cameroon.

This study therefore explores the relationship between fatalistic beliefs and health risk-taking in three levels of study: primary level (person who has studied from kindergarten to middle school), secondary level (person who has obtained a Certificate of Primary Education and has done pre-university studies) and university level (person who has obtained a bachelor's degree and has done post-secondary studies). Starting from the idea of Powe (2001) who states that people with little education are more fatalistic than those with a better education and that of Shen et al. (2009), Mvessomba et al. (2017) and Ngueusta (2012) who show that people with a low level of education (primary) are categories of participants who are particularly fatalistic and take more risks, we predict an effect of the level of study on fatalism and on the risk-taking of participants (hypothesis 2).

2 METHOD

2.1 PARTICIPANTS AND PROCEDURE

Our sample consisted of 219 participants aged 18 to 63 years (108 men and 111 women, mean age = 26 years). The sample consisted of 48% men and 52% women. The average age of participants was 28 years (SD = 12 years). More than 45% of respondents are under the age of 36 and just over 60% have less than 10 years of seniority. 88 participants had a primary level of education, 71 participants had a secondary level of education, and 60 participants had a university level of education. Tous were French speakers from the city of Yaoundé selected using the simple random sampling technique. The study was presented as an investigation into attitudes towards Covid-19. Participants who met the inclusion criteria were first informed verbally of the purpose of the study, the confidentiality and voluntariness of their participation, and the possibility of withdrawing from the study at the desired time. They were then given an informed consent form that they had to read and sign if they approved the study. For those who agreed to participate, they completed the questionnaire and gave it to the researcher.

2.2 INSTRUMENTS

Fatalistic beliefs were assessed using the measurement scale proposed by Shen et al., (2009). This instrument is composed of 20 items that question participants about how they felt over the past month. For each item, participants were invited to position themselves on a five-point Likert-type response device ranging from "from not at all agree (1) to completely agree (5)". The factorial structure of the construct of fatalistic beliefs revolves around three dimensions: **Predetermination** (10 items, example: "If someone was predestined to have COVID-19, no matter the barrier measures, he will have this disease"), **Luck** (4 items, example: "My good health is a matter of luck"),

and **Pessimism** (6 items, example: "I will suffer a lot from my vulnerability in society"). Analysis of the internal coherence index (α) yielded acceptable Cronbach alpha scores (fatalism α = .67; predetermination α = .70; chance α = .69; *pessimism* α = .79).

Risk-taking was measured through the items of motivation to protection and attitude to barrier measures namely wearing a mask and washing hands. For this model, five measurements were made: the intention to wash hands with soap and wear the protective mask in public; perceived vulnerability (if I have COVID-19 for lack of handwashing with soap, I will probably be very severely weakened; perceived severity (if I go out without a mask, I will probably be infected with COVID-19); effectiveness of the recommendation (if I always wash my hands with soap, I won't have COVID-19) and the cost of motivation (regular handwashing with soap wastes my time). The attitude was measured using a 5-point bipolar item (For you, washing your hands with soap is bad/good, serious/not serious, exciting/not exciting).

2.3 DATA ANALYSIS

The data collected was processed from the analyses of variance, correlation and regression on SPSS software version 23. First, the analysis of variance made it possible to test the effect of the level of study on fatalism and risk-taking vis-à-vis the Covid-19 pandemic. Then, the correlation analysis made it possible to test the linear relationship between the dimensions of fatalism and those of risk-taking. Finally, the regression analysis made it possible to test whether fatalism is a predictor of risk-taking vis-à-vis the Covid-19 pandemic.

3 RESULTS

The results of this study are presented in two stages. First, we test the effect of the level of study on fatalistic beliefs and on the motivation to protect one self. In a second step, correlations and regressions are analyzed. The results, through the indices of linear associations (*r*), make it possible to assess the strength of the links between the variables of the study and their respective dimensions. Subsequently, we report on the analysis of the regression between fatalistic beliefs and risk-taking related to Covid-19. This regression analysis will examine the causal relationship between these two quantitative variables, highlighting the weight of the effect of the first (fatalistic beliefs) on the second (risk-taking related to Covid-19). This weight is concretely analyzed thanks to the standardized beta coefficients (β) and beta *t-values*.

Table 1. Effect of level of study on fatalistic beliefs and risk-taking

	Primary	Secondary	Academic		
	M	M	M	F	p
	(SD)	(SD)	(SD)		
Predetermination	2.71	2.59	2.28	5.46	.0006
	.531	.720	.731		
Luck	2.76	2.11	1.92	7.12	.002
	1.015	.865	.853		
Perceived vulnerability	3.80	3.29	3.34	3.61	.032
	.885	1.06	1.15		
Intention	4.50	3.74	3.69	14.8	.001
	.624	1.08	1.13		
Perceived severity	3.79	3.30	3.01	4.21	.019
	1.13	1.11	1.25		
Effectiveness of the recommendation	3.86	3.24	2.84	7.41	.0001
	1.07	1.17	1.30		
Cost of the recommendation	4.25	3.78	3.85	3.71	.029
	.788	1.01	1.55		

Table 1 shows that the level of education has an effect on fatalistic beliefs (F (2.115) = 5.83, p =.004), and on risk-taking (F (2.115) = 9.29, p =.001). In other words, the degree of fatalism and risk-taking among participants varies according to the level of study. On the one hand, at the level of fatalism, this variation is expressed at the level of predetermination and luck. At the level of predetermination, compared to participants with a university level of education, participants with a primary education level tend to feel that the world is predefined by a divine order and therefore a pandemic like COVID-19 is perceived as a punishment from God (F (2.115) = 5.46, p =.0006). At the level of luck, compared to participants with a university level of education, participants with a high school level tend to consider

that everything that happens to an individual is a matter of fate, chance or fate. Therefore, for them, if you are to be infected with COVID-19, no matter how hard you try, you have to be lucky to avoid it (F (2.115) = 7.12, p =.002). On the other hand, at the level of risk-taking, this variation is expressed in the level of perceived vulnerability, intent, perceived severity, effectiveness of the recommendation and cost of the recommendation.

In terms of perceived vulnerability, compared to participants with secondary and university education, those with primary education feel that they will not be sick even if they do not wear a mask or wash their hands regularly (F (2.115) = 3.61, p =.032). In terms of intent, compared to participants with secondary and university education, those with primary education do not show an intention to respect mask wearing and do not wash their hands regularly (F (2.115) = 14.8, p =.001). In terms of perceived severity, compared to participants with primary education, those with secondary and university education feel that they are likely to be very severely weakened if they do not wear a mask or wash their hands regularly (F (2.115) = 4.21, p =.019). In terms of the effectiveness of the recommendation, unlike participants with secondary and university education, those with primary education consider that mask wearing or routine handwashing is not effective against COVID-19 (F (2.115) = 7.41, p =.0001). Finally, with regard to the cost of the recommendation, compared to participants with secondary and university education, those with primary education consider it a waste of time to wear a mask and wash their hands regularly (F (2.115) = 3.71, p =.029). These results confirm our first hypothesis that the level of study influences fatalism and risk-taking. To test the second hypothesis we proceeded to the calculation of correlations and regressions.

Table 2. Correlations between COVID-19 beliefs and risk-taking

	Pr	Attmask	Attmain	Vul	Intention	Grav	Eff	Cost
Fatalism	.175**	-.206**	-.163*	.156*	.062	.213**	.105	.106
Pessimism	.153*	-.127	.033	.110	.099	.238**	.089	.022
Predetermination	.071	-.140*	-.182**	.146*	-.048	.076	.013	.065
Luck	.175**	-.205**	-.163*	.061	.164*	.214**	.189*	.172*

Note: PR: risk-taking; Attmask: attitude towards the mask; Attmain: attitude towards hand washing; Vul: perceived vulnerability; Grav: perceived gravity; Eff: effectiveness of the recommendation.

*****.** The correlation is significant at the 0.01 level (bilateral). ***.** The correlation is significant at level 0.05 (bilateral); with n= 219.*

Table 2 presents the results of the correlations between fatalistic beliefs and the dimensions of risk-taking with which it has a significant correlation. Overall, it appears that individuals with fatalistic beliefs tend to neglect compliance with COVID-19 barrier measures (r (219) = 0.175, p < 0.01). Detailed analysis indicates that the three dimensions of fatalistic beliefs are correlated with different indicators of risk-taking. Individuals who feel that there are certain things in life, including serious events, that would occur regardless of the measures they take tend to neglect hand washing with soap (r (219) = -0.182, p < 0.01) and wearing a mask in public (r (219) = -0.140, p < 0.05). They also estimate that if they have COVID-19 for lack of hand washing with soap or not wearing a mask in public, they will probably be very seriously weakened (r (219) = 0.146, p < 0.05). Subsequently, pessimistic participants, i.e. those who tend to view things on the wrong side, in the present or in the future, take the risks (r (219) = 0.153, p < 0.05). For the latter, if they go out without a mask, they estimate that they will probably be infected with COVID-19 (r (219) = 0.238, p < 0.01). Finally, participants for whom life events such as being infected with COVID-19 are random, neglecting behaviors such as washing hands with soap (r (219) = -0.163, p < 0.01) and wearing the mask in public (r (219) = -0.205, p < 0.01). For the latter, the intention to wash their hands with soap and wear the protective mask in public is not useful (r (219) = -0.164, p < 0.05). They also estimate that, if they go out without a mask, they will probably be infected with COVID-19 (r (219) = -0.214, p < 0.01). They also feel that even if they always wash their hands with soap or regularly wear the mask in public, they would still have COVID-19 if it were to happen to them (r (219) = -0.189, p < 0.05). For them, washing their hands regularly with soap wastes their time (r (219) = 0172, p < 0.05).

Table 3. Regression analysis (fatalistic beliefs, risk-taking)

Predictor	Vd	Beta	t	GIS	R2 adjusted	F	GIS
Fatalism	Pr	.175	2.613	.010	.026	6.826	.010[b]
	attmask	-.163	-.2.438	.016	.022	5.943	.016[b]
	attmain	-.206	-3.099	.002	.038	.606	.002[b]
	Grav	.213	3.210	.002	.045	10.302	.002[b]
Pessimism	Grav	.238	3.609	.000	.052	13.026	.000[b]
Predetermination	attmask	-.140	-2.076	.039	.015	4.309	.039[b]
	attmain	-.182	-2.727	.007	.029	7.438	.007[b]
	vul	.146	2.710	.031	.017	4.708	.031[b]
Luck	Pr	.211	3.173	.002	.040	10.080	.002[b]
	attmask	-.205	-3.078	.002	.037	9.472	.002[b]
	Grav	.214	3.232	.001	.042	10.434	.001[b]

Note: PR: risk-taking; attmask: attitude towards the mask; attmain: attitude towards hand washing; Vul: perceived vulnerability; grav: perceived gravity.

Table 3 presents all the predictors that are relevant for a dimension of risk taking. Overall, we observe that fatalistic beliefs explain risk taking (β = 0.175, t (217) = 2.613, p =.010, F (2.217) = 6.826, p = 0.010). Moreover, we observe at the level of the pessimism dimension that the participants who think that there are certain things in life, including serious events, which are justified whatever the measures they will take tend to estimate that s 'they go out without a mask or if they do not wash their hands regularly, they will probably be contaminated (β = -.238, t (217) = 3.609, p =.000, F (2.217) = 13.026, p =.000). On the other hand, with respect to the predetermination dimension, the belief that if an individual was predestined to have COVID-19, regardless of the barrier measures, he will have this disease explains the non-wearing of a mask (β = -.140, t (217) = -2.076, p=0.039, F (2.217) =4.309, p=.039); not washing hands with soap (β = -0.182, t (217) = -2.727, p =.007, F (2,217) = 7.438, p =.007) and the fact that participants would probably be very seriously weakened in case of contamination (β =.146, t (217) = 2.710609, p =.031, F (2.217) = 4.708, p = 0.031). Finally, with respect to the luck dimension, the belief that good health is a matter of luck predicts risk taking (β =.211, t (217) = 3.173, p =.002, F (2.217) = 10.080, p =.002). Participants who believe their lifespan depends on luck tend to neglect wearing a mask in public (β = -.205, t (217) = -3.099, p = 0.002, F (2.217) = 9.472, p =.002) and estimates that they will probably be contaminated with COVID-19 in the event of non-compliance with barrier measures (β =.214, t (217) = 3.232, p =.001, F (2.217) = 10.434, p =.001).

4 DISCUSSION

The objective of this study was to examine the relationship between educational attainment, fatalistic beliefs and risk-taking related to barrier measures in the face of the COVID-19 pandemic. The analysis of the data collected from our sample highlights the effect of the level of study on fatalism and risk-taking. Indeed, the results of the first hypothesis confirm that the level of study acts on fatalism and risk-taking. In other words, participants with a relatively low level of study (primary), tend to be more fatalistic and less respect barrier measures. This result can be understood to the extent that those with a low level of study do not have enough knowledge about the disease, do not properly master the transmission/contagion process. They regularly use beliefs in their daily lives and therefore use them to act. Indeed, when an individual at a low level of study, he is more inclined to believe that he has greater control over life events. The lack of education prevents him from acquiring scientific and technological skills but also and above all from increasing his cognitive abilities (Cuna & Neckman, 2007). As a result, these individuals regularly appeal to fatalistic beliefs when called upon to explain complex life events such as the onset and contagiousness of COVID-19.

Kouabenan (2007) explains, for example, that during risk assessment, an ordinary individual is subjected to a complex operation that requires a large cognitive load to process five registers of information. Thus, to assess a situation as risky or not (the case of COVID-19), the individual is called upon to integrate simultaneously: multiple active variables to be taken into account to have a satisfactory description of the situation; clues from multiple sources that need to be gathered and integrated to get an idea of the risk; uncertainty related to the equivocal nature of the meaning of the signs and indices used to describe the risk; the presence of positive objectives whose activities implemented to achieve them are at the origin of the risky situation to be assessed and the assessment of the effects of the risk in the short and long term, at the individual, group and societal levels. Thus, simultaneously processing these five registers of information to assess the risk is almost a difficult bet for the ordinary individual. This is the reason why people with a low level of education regularly resort to beliefs. This is also shown by the work of Powe (2001), Ngueusta (2012), Shen et al (2009), Freeman (1989) for whom the level of education influences fatalistic beliefs and therefore risk-taking.

The results from the correlation and regression analysis confirm our second hypothesis. In other words, fatalistic beliefs that reflect a lack of control are linked to risk-taking related to barrier measures vis-à-vis the COVID-19 pandemic. These results confirm those of previous studies showing that fatalistic beliefs can have a negative effect on the achievement of safety-related actions and can reduce the motivation to engage in safety-related behaviors (Claassen et al. 2010; Kayani et al. 2012; Kouabenan 1998; Peltzer & Renner 2003;). For example, Kouabenan (1998) shows that fatalists generally tend to attribute road accidents to factors over which the driver has no control in order to minimize the role of factors involving initiatives on their part. For him, "fatalistic beliefs, which can lead to a weak sense of control over events, are likely to induce resignation and passivity with regard to measures of security and self-protection" (p. 339). Claassen et al. (2010) state that a fatalistic belief is a belief that risk is unavoidable and can "harm the motivation to engage in risk-reducing behavior" (p. 184). In other words, participants for whom the conviction that death is inevitable in the event of serious danger, will tend to neglect compliance with barrier measures. In the same logic, Straughan and Seow (1998) add that the perceived lack of internal control of the individual over the events of his life (external locus of control) promotes resignation and therefore neglect of compliance with security measures. The notions of fate, chance, perception of powerlessness, despair, insignificance are for this purpose elements on which the fatalists rely to emit a behavior (Chavez et al., 1997; Cohen & Nisbett, 1998 Davidson et al., 1992; Neff & Hoppe, 1993; Straughan & Seow, 1998).

For Powe and Jonhson (1995), fatalistic individuals rely on fear, inevitable death, pessimism and predetermination in explaining the serious events that happen to them. In addition to these factors, Straughan and Seow (1998) add the perceived lack of the individual's internal control over life events (external locus of control). The notions of fate, luck, perception of powerlessness, despair, and insignificance will also be taken into account in the explanation of life events (Chavez, Hubbel, Mishra & Valdez, 1997; Cohen & Nisbett, 1998; Davidson, Frankel & Smith, 1992; Neff & Hoppe, 1993; Straughan & Seow, 1998).

The results obtained in this study can also be explained by reference to the theory of motivation for protection (Rogers, 1983). This theory shows that, in general, the effectiveness of a response minimizes the rejection of a protection message (Lewis et al., 2008). As a result, the lower the effectiveness of a perceived response (e.g. wearing a mask), the less individuals believe in the recommended conduct to overcome the threat and the more they adopt less safe behaviors. As a result, predetermination that leads to biases on participants' perception of the effectiveness of recommendations that suggest wearing a mask in public or washing hands regularly with soap to avoid or reduce the risk of COVID-19 contamination leads to non-compliance with barrier measures. This theory also suggests that self-efficacy is an important component capable of successfully stimulating behavior change. The stronger the individual's perceived self-efficacy, the more effort he will make to implement the recommended behavior (Bandura, 1977). It therefore turns out that the bias generated by predetermination is also noticeable on the participants' ability to comply with the recommendation that suggests wearing the mask in public or washing their hands regularly with soap. In addition, the HBM gives an important place to the beliefs of the individual in its adoption of preventive measures (Mvessomba et al., 2017). This theory holds that beliefs influence individuals whether or not to adopt security measures. Thus, luck that conveys the belief that life events are random, lucky or bad luck could have a detrimental influence on the adoption of safe driving. For Teigen (1998), luck increases in the individual who believes in it self-confidence and generates an illusion of control. The latter will minimize losses and overestimate gains when he has to engage in driving. The individual who believes in luck is the one who consciously engages in risky conduct and gets away with it. The latter will therefore associate the favourable outcome of the exposure to the risk with the behavior it has adopted. Luck thus increases self-confidence without increasing skills, which also amplifies reactions (Teigen, 1998). The individual who believes in luck will try to repeat the lucky action, but in addition he will do it with more confidence.

Several studies show that believing in luck or bad luck promotes an underestimation of risk and pushes individuals to adopt less safe behaviors (Kouabenan; 1998, 1999, 2006, 2009; Ngueusta, 2012; Peltzer & Renner, 2003). These authors show that individuals who believe that life events are a matter of chance, feel that they have control over happy events and that they do not have control over unfortunate events. A pessimistic individual on the other hand is one who has experienced several negative events in his life, he believes that these events are uncontrollable and that there is no point in protecting himself. We generally observe in the pessimist a form of resignation that will lead him not to believe in the effectiveness of the recommendations that aim to protect him. Referring to our results, it is therefore understandable why pessimistic participants do not believe in the effectiveness of the recommendation that suggests wearing the mask in public or washing hands regularly with soap to avoid or reduce the risk of COVID-19 contamination.

5 CONCLUSION

Going through the literature on issues relating to the consideration of compliance with safety measures, it is clear that many studies have looked at it while insisting on the need to adopt the prescribed behaviors in order to minimize complications, negative consequences and risk factors, of the disease. Overall, these studies show that perceptions related to disease are decisive in the health behaviors of populations and that their influence is often at the origin of non-compliance, which particularly affects compliance with safety measures in the event of a pandemic (Maercker et al., 2019). The results obtained in this work point in the same direction. They showed that the level of study influences the use of fatalistic beliefs and risk-taking on the one hand. On the other hand, they show that

fatalistic beliefs influence the respect of barrier measures in participants. The present work has therefore made it possible to highlight to some extent the place occupied not only by certain beliefs but also by the level of study in the adoption of safety behaviors. In particular, when an individual feels unable to act on events (mainly in those with a relatively low level of education), especially future ones regardless of the security measures he adopts, and this will have no impact on what should happen to him. The fatalist refuses the ability to deliberate on what will happen; he believes that even his own behavior does not depend on him (Mvessomba et al., 2017). This study offers important results in the field of prevention. It points out that, like previous studies, awareness related to hygiene or barrier measures is necessary but insufficient to trigger safety or protective behavior (Clayton et al. 2002; Kouabenan & Ngueutsa, 2016). It suggests improving the design of preventive measures oriented towards actions that take into account the beliefs of the target population. It is therefore important to design actions and messages aimed at generating beliefs not only in the effectiveness of preventive measures but also in the ability of populations to implement them. This could be done both by highlighting the effectiveness of security measures and by creating conditions for their implementation that requires less effort. Awareness programs must demonstrate to the public the effectiveness of preventive measures rather than simply enacting barrier measures.

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