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Risk perception in the elderly during the first phase of epidemiological emergence from Covid-19

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Abstract

Several studies have examined the impact of COVID-19 emergence on people's mental health, investigating the relationship between risk perception and psychological well-being, (especially for people in quarantine) and between risk perception and the adoption of healthy behaviors. Few studies have focused explicitly on the elderly, a population identified as particularly vulnerable to SARS-CoV-2 infection and its consequences. The objective of the present research was to study the relationship between the elderly experience of the pandemic and the perceived risk of infection with three variables: emotional regulation, perceived acute stress, and quality of life.

The results showed that Direct experience of the pandemic was related to lower stress levels and higher emotional regulation. While Indirect experience and the perceived risk of COVID-19 contagion were related to a higher level of acute stress, poorer emotional regulation, and a significant reduction in quality of life. The pandemic situation and, in particular, the fear of contagion seems to have left an important mark on older people, who manifest high levels of Risk as Feeling together with high levels of acute stress. Therefore, high risk perception may be an important peritraumatic factor.

Keywords: COVID-19; elderly; risk perception; emotion regulation; quality of life; stress; aging.

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Introduction

The epidemiological emergency from COVID-19 hit Italy in February 2020 and on March 11, the Italian government ordered restrictive measures throughout the country to contain contagion from the virus. During this phase (lock-down), it was forbidden throughout Italy to leave the house except for proven business needs, health reasons, or essential reasons such as purchasing food or medication. The lock-down lasted until May 4, when the so-called "Phase 2" began and people were slowly allowed to leave their homes with certain precautions (wearing a surgical mask indoors, prohibition of gathering activities, and social distancing). As a result, Italians experienced (at least) two months of social isolation and behavioral restrictions.

Several studies have examined the impact of COVID-19 emergence on people's mental health, both in Italy (e.g. Cannito et al., 2020; Savadori & Lauriola, 2021), and worldwide (e.g. Huang & Zhao, 2020; Torales et al., 2020; Zhu et al., 2020). Research on the viral epidemic has widely negative outcomes such as feelings of fear, stress, and worry (Ahorsu et al. 2020; Bao et al. 2020). The relationship between risk perception and psychological well-being has been investigated, especially for people in quarantine (Chong et al., 2004; Liu et al., 2012; Liu et al., 2020b; Wu et al., 2009), together with the relationship between risk perception and the adoption of healthy behaviors (Carlucci et al., 2020). However, few studies have focused explicitly on elderly subjects, a population identified as particularly vulnerable to SARS-CoV-2 infection and its consequences (Verity et al., 2020; Robb et al., 2020). Some researchers pointed out that older people could experience more stress and fear in this emergency and that forced isolation could impact their psychological well-being (Morrow-Howell et al., 2020; Wand et al., 2020). Other studies, however, have suggested that the elderly may be able to cope well with the emergency. For example, López et al. (2020) examined psychological well-being in the Spanish elderly, comparing the young (60-70 years old) and the elderly (71-80 years old). The results indicated that the elderly showed a level of well-being comparable to that of the young-old, suggesting that people in late adulthood have effective personal resources and coping adjustment strategies.

Beyond these studies, little is known about how older people are experiencing the health emergency and whether they perceive it differently than younger subjects. Based on social-emotional selectivity theory (SS; Carstensen et al., 2003), because of their narrow time horizon, older people are more focused on the present, less focused on the future, and more oriented toward positive emotions and meaning in life (Fung & Isaacowitz, 2016; Mammarella et al., 2013). Empirical evidence has shown that the elderly have selective attention toward positive stimuli and show aversion to negative stimuli; remember emotionally charged information better than neutral information and tend to remember events more positively (Fairfield et al., 2015); tend to avoid social conflict and negative emotions in general and report a high level of well-being and emotional regulation (Charles & Carstensen, 2010; Lecce et al., 2019). This phenomenon, known as the "positivity effect," may have an impact on how older people made experience of COVID-19 emergence. It is conceivable that older people, because of their aversion to negative stimuli, have more positive attitudes toward the pandemic than young and middle-aged adults (Löckenhoff & Carstensen, 2004). A U.S. population survey (n = 6666) examined the perception of COVID-19-related risk (i.e., perceived chance of being infected and perceived lethality of the disease) during adulthood (Bruine de Bruin, 2020). Results indicated a positive linear relationship between age and perceived risk of infection-mortality; however, age was negatively correlated with perceived risk of infection and risk of being quarantined. In addition, older people reported lower anxiety and depression scores. The author concluded that older people are relatively more optimistic than younger adults, perhaps because of their emotion regulation strategies.

Exploring emotions and attitudes in reaction to the COVID-19 epidemic is therefore critical as impacts people's behaviors, mediating the relationship between risk perception and mental health (Han et al.,2021). Moreover, perceived risk may influence how people adapt to respond to the emergency (Carlucci et al., 2020). Several contributions have shown that people with a higher level of COVID-19-related fear showed greater compliance with public health measures (Brouard et al., 2020; Jørgensen et al., 2021). Risk perception has been extensively explored in many different contexts, and the literature has highlighted the influence of both demographic and social factors on risk perception (Lanciano et al., 2020; Weber et al., 2002). Measures to counter the pandemic have emphasized the role of individual differences in the assessment and response to the emergency, and the challenges inherent in promoting precautionary behaviors (Lo Presti et al., 2022; Han et al., 2021). In particular, risk perception appears to decrease with increasing age (Bruine de Bruin, 2020; Pasion et al., 2020) and has been described as greater in women than men (Gustafson, 1998; Harris & Jenkins, 2006). Lower risk perception has been reported in older adults than in younger adults during H5N1 and COVID-19 outbreaks (Fielding et al., 2005; Pasion et al., 2020). In addition, social proximity with people affected by the virus may also influence risk perception. For example, one study found that people who knew someone infected with COVID-19, perceived higher risk and more anxious thoughts than others (Liu et al., 2020b). Given the global scale of the current COVID-19 pandemic along with the need for governments to quickly communicate preventive measures to the entire population, it was necessary to examine the weight that information sources had in determining the perceived risk associated with COVID-19.

Personal responses to a critical event can vary in type and intensity, showing a high degree of interindividual variability (Kwok et al., 2020). Some individuals exhibit a fair level of stress tolerance and can retain the clarity necessary to cope with the emergency, showing the ability to manage their emotions and behave appropriately to the situation. However, deferred reactions may occur over time, which may later evolve into pathology. In recent years, it has been recognized that overregulation of emotions may be related to several serious psychophysical illnesses. Rachman (Baker et al., 2007) first introduced the concept of "emotional processing" in the context of anxiety disorders. He noted that while most people

successfully process the majority of disturbing events that occur in their lives, sometimes, however, failures in emotional processing occur. Excessive avoidance or prolonged, rigid inhibition of negative emotional experiences would prevent their reintegration and resolution. Signs of this failure may be, for example, the return of fears, obsessions, and/or intrusive thoughts. In a recent paper (Yang et al., 2020), it reports how the pandemic can exacerbate pre-existing disorders.

In light of these considerations, it is clear that investigating risk perception in the elderly to the COVID-19 pandemic is most important. It is especially crucial to consider factors such as perceived stress, quality of life, and emotional regulation to assess the impact of the health emergency on their lives. Therefore, this study aimed to investigate the relationship between the perceived risk of contagion by a group of elderly people with three variables: emotional regulation, perceived acute stress, and quality of life. It can be hypothesized that the perceived risk of contagion may be positively correlated with perceived acute stress and may negatively correlate with both quality of life and emotional regulation of participants.

Methods

Participants

The present research was conducted on a group of 150 participants (104 female and 46 male) aged 65 to 92 years (mean=73.25, ds=4.74) and an education ranging from 5 to 21 years of schooling (mean=14.17, ds=3.91). The majority of the sample (63%) resides in the center of the country, 21% in the north and 16% in the south or islands. Table 1 shows the distribution of subjects by two age groups and by gender. All subjects joined the research on a volunteer basis and were recruited through six channels: sports clubs, community centers, Caritas, Sant'Egidio community, volunteer centers, and by word of mouth with psychologists who work with elderly people.

Tab. 1. Distribution of subjects by Two Age Groups and Gender

	Gender		
Age	**F**	**M**	**Totals**
65-74 years	73	30	103
75-92 years	31	16	47
Totals	104	46	150

Instruments

The following instruments were used:

1) A semi-structured interview was used and it was adapted from Savadori and Lauriola (2021) work to investigate the following six topic areas: (a) affective attitude toward the coronavirus, which investigates the general affective assessment that the people do about the hazard; (b) performing activities, which assess the impact of the pandemic on the daily activities; (c) support received from the community (e.g. volunteer associations, local care service, neighbors, friends); (d) any other changes in their life; (e) risk perception in its two components, Risk as Feeling (how afraid the respondent feels of the virus and how risky the infection would be to their health) which relay on a instinctive and intuitive reaction to a threat, and risk as analysis which refer to likelihood of contracting the virus, and relay on reason, logic and deliberate process; (f) direct(through people near them) and indirect experience (through media) of the virus. All items and descriptions of their areas of affection are reported in Table 2. Five scales were obtained from the sum of the row scores: (1) Direct experience; (2) Indirect Experience; (3) Risk as Feeling; (4) Risk as Analysis; (5) Total Risk, which is the sum of the previous two.
2) Emotional Processing Scale (EPS-A): an Italian adaptation, by Lauriola et al. (2021), of the Emotional Processing Scale (EPS-38; Baker et al., 2007; 2010) was used. It's a self-report questionnaire consisting of 2 open-ended questions and 25 items rated on a 9-point Likert scale. The scales examines the mechanisms and processes involved in emotional processing and any signs of unprocessed emotional material. This multidimensional scale incorporates Rachman's (1980) original conceptualization of emotional processing. The EPS includes 5 subscales each consisting of 5 items: Suppression, referring to attempts to control or suppress feelings; Unregulated Emotions, intrusive and persistent emotional experiences indicating that important emotional material that has not yet been processed; Control, relating to experiences and behavior, suggesting a failure to control emotional expression; Avoidance, experiential or internal of stimuli that trigger an emotional response; Emotional Experience, related to the concept of alexithymia, in which patients have difficulty labeling emotions, linking them to events, or feeling detached from their emotional experiences. The total EPS-A score represents the overall assessment of all items. Higher subscale scores and total scores indicate greater emotional processing deficits.
3) National Stressful Events Survey Acute Stress Disorder Short Scale (NSESSS) Severity of Acute Stress Symptoms - Adult (American Psychiatric Association, 2013). The NSESSS is a 7-item instrument that assesses the severity of acute stress disorder symptoms in individuals older than 18 years following an extremely stressful event or experience in the past seven days. Each item is rated on a 5-point scale (0 = Not at all; 1 = Slightly; 2 = Moderately; 3 = Somewhat; 4 = Very much). The total score ranges from 0 to 28; the higher the scores, the greater the severity of the acute stress disorder. The mean total score converts the total score to a 5-point scale, which allows the clinician to rate the severity of acute stress disorder in the subject as none (0), mild (1), moderate (2), severe (3), or very severe (4). The mean total score was found to be reliable, user-friendly, and clinically useful in DSM-5 Field Trials.
4) Older People Quality of Life-35 (OPQOL-35, Bowling, 2009). The OPQOL-35 is a multidimensional QoL questionnaire with a constructivist approach firmly embedded in the older person's perspective. It consists of 35 items with a 5-point Likert scale from "Strongly Disagree"

to "Fully Agree". The dimensions investigated are: life overall, which assesses how enjoyable or unpleasant the life of the person is; health, which focuses on how much the person feels healthy; social relationships, which explore the social network of the subject; independence, control over life, and freedom; home and neighborhood, which focus on feelings regarding the neighborhood and home; psychological and emotional well-being, which assess the capacity of the individual to do not be overwhelmed and to cope with negative events; financial circumstances, items reflect the possibility of the subject to pay household bills and repairs, to buy things they want, and do enjoyable activities; and leisure, activities, and religion, which assess how much the person is leaving an active life in different areas (e.g. cultural/religious events and festivals are important to my quality of life). Higher scores are linked to higher QoL; the scale ranges from 35 (QoL this bad could not be worse) to 175 (QoL this good could not be better). Cronbach's Alpha reliability index was calculated for each of the measures used in this research. Reliability coefficient was excellent for EPS-A (α = .93), acceptable for NSESSS (α =.76), good for OPQOL-35 (α =.84), and for the measures included in the interview: Direct experience showed an Alpha level of .74, instead Indirect experience showed a coefficient of .36, Risk as Feeling showed a coefficient of .90, Risk as Analysis .67, and the Total Risk score.74.

Data analysis

The particular health emergency situation imposed a telephone type of data collection mode; occurring immediately after the lock-down, between the beginning of phase 2, in which there was a relaxation of containment measures, and phase 3 of living with the virus (12/05/2020 - 18/07/2020).

Several correlation analyses were performed and the investigated indices were correlated with each other to investigate possible relationships among them. Cohen's guidelines (Cohen, 1990) are followed to interpret the correlations: r between .10 and .29 small correlation; r between .30 and .49 medium correlation: r between .50 and 1.0 large correlation.

Tab. 2. Items of the Semi-structured Interview and their respective afference areas

Area	Description	Item	Response scale
Affective attitude	The holistic affective reaction associated with the hazard	Do you feel like trying to describe your emotional state in reference to this pandemic?	Free answer
		Are you concerned about your health? Have you been vaccinated? Will you get vaccinated?	Free answer
		Were there times when you felt lonely and afraid?	Free answer
Performing activities	Impact of the coronavirus on daily activities	Did you find it difficult to adapt to the changes and modify your daily habits?	Free answer
		How many times do you go out per week?	Free answer
		How do you invest your time?	Free answer
Support received from the community	Assess if the person has received help from others	During difficult times, did anyone help you? (public agencies, family, friends, neighbors, etc.)?	Free answer
		Have you used voluntary solidarity services for your personal needs such as groceries, food, and/or medicines? (Italian Red Cross, voluntary associations?)	Free answer
Changes in their life	This area aims to collect any information on how the pandemic changes different part of people lifes	Can you describe what kind of changes you have experienced in your life?	Free answer
Risk perception: Risk as Feeling	Describes one's instinctive and intuitive reactions to threat	When you think of coronavirus, how scared do you feel?	Not at all, Slightly, Moderately, Vary, Extremely
		Your first reaction when you hear about someone who has the coronavirus is "someday it might be me."	Strongly in disagreement, Quite in disagreement, Neither in agreement nor in disagreement, Quite in agreement, Strongly in agreement
		If you were infected with coronavirus, how risky would it be for your health?	Not at all risky, Slightly risky, Somewhat risky, Very risky, Extremely risky, Don't know
		How likely do you think it is that you will contract the coronavirus?	Not at all likely, Slightly likely, Somewhat likely, Very likely, Extremely likely, Don't know
Risk perception: Risk as analysis	Is based on logic, reason, and deliberative processes	If you did not follow the rules to prevent coronavirus infection, how much do you think your chances of contracting the virus in the next month?	0 = Almost nothing; 10 = Almost certain
		Compared to a person of the same age, gender, type of work, and lifestyle as you, how much do you think you are likely to contract the coronavirus in the next month?	0 = Much less likely; 5 = Equally likely; 10 = Much more likely

Area	Description	Item	Response scale
Direct experience	Explore if the individual had a contact with someone that have died or contracted the coronavirus	Indicate one of the three answers:	At least one of my close friends or relatives died of coronavirus, Someone I know (who is not a close friend or relative) has died of coronavirus, No one I know died of coronavirus
		Indicate one of the three answers:	At least one close friend or relative of mine has contracted coronavirus, Someone I know (who is not a close friend or relative) contracted the (but did not died of) coronavirus, No one I know has contracted (but not died of) coronavirus
Indirect experience	Explore how often the individual has a contact with information regarding the coronavirus through mass-media	How often have you heard about coronavirus in the media (newspapers, radio, television, internet) as a cause of death?	Never, Rarely, Sometimes, Often, Always
		How often have you heard about coronavirus from the mass media (newspapers, radio, television, internet) as a cause of suffering?	Never, Rarely, Sometimes, Often, Always

Results

The elderly's perceived risk of contagion as a function of his or her emotional regulation, acute stress, and quality of life was studied. Correlations between the dimensions of risk perception with the other constructs were then calculated. Moreover, the relation between two different ways in which the elderly experience the pandemic (direct and indirect) with their emotional regulation, acute stress, and quality of life was analyze. The results obtained are shown in Table 3.

From an analysis of the relationship between the elderly's experience of the pandemic and emotional regulation, emerges a significant negative correlation between the direct experience that the elderly have through contact with family members or friends who have contracted the virus (Direct Experience) and all EPS scales. These results suggest that high levels of Direct Experience correspond lower degree of: the tendency to suppress emotional states (EPS-Suppression), to make experience of intrusive, persistent, and unprocessed emotional material (Unregulated emotions), uncontrolled emotional expression (EPS-Control), avoidance of inner or external elements that can trigger unpleasant emotions (EPS-Avoidance), emotional detachment (EPS-Emotional experience), in general, problems in processing emotion of stressful events. On the other hand, the frequency with which the elderly hear about coronavirus from mass media, either as a cause of death or as a cause of suffering (Indirect Experience), is positively associated with the EPS scales Suppression, Unregulated emotions, emotional experience, and the Total score. This result suggests that the more the elderly hear about the pandemic and more they tend to suppress their emotion, to have unprocessed emotional

Tab. 3. Correlations among Key Study Variables between Risk Perception and EPS, NSESSS, and OPQOL (n=150)

		Direct Experience	Indirect Experience	Risk as Feeling	Risk as Analysis	Total Risk
Emotion Regulation	EPS-Suppression	-.260**	.185*	.196**	.171*	.188*
	EPS-Unregulated emotions	-.337***	.192*	.248**	.141*	.188*
	EPS-Control	-.191*	.073	.067	.127	.086
	EPS-Avoidance	-.184*	.076	.292**	.215**	.259**
	EPS-Emotional experience	-.356***	.223**	.260**	.241**	.252**
	EPS TOT	-.332***	.187*	.266**	.222**	.242**
Acute Stress	STRESS (NSESSS)	-.370***	.225**	.270**	.226**	.247**
Quality of life	OPQOL- life overall	.224**	-.164*	-.274**	-.236**	-.269**
	OPQOL- social relationships	.157	-.159	-.033	-.075	-.060
	OPQOL- independence, control over life and freedom	.028	-.069	-.090	-.076	-.098
	OPQOL- Home and neighborhood	.032	.002	.139*	-.044	.058
	OPQOL- Psychological and emotional well-being	.123	-.103	.033	.102	.076
	OPQOL- Financial circumstances	-.049	-.120	-.054	-.025	-.073
	OPQOL- leisure, activities and religion.	.053	-.096	.312**	.124	.231**
	OPQOL TOT	.160	-.174	-.002	-.062	-.038

material, to be less aware of their emotion, and to have problems with the regulation of emotions in general.

Regarding the systematic relationships between aspects of emotional regulation and risk perception, a small significant positive correlation emerges between the elderly's tendency to suppress their negative emotional states (EPS- Suppression) with their fear of possibly contracting the virus (Risk as Feeling); Moreover, significant positive correlations are found between suppression and manifestation of negative emotional states with Risk as Analysis and risk of infection (Total Risk). A similar relationship was found between a greater inability to properly process emotional experiences (EPS- Unregulated Emotions) with high levels of the three scales of risk perception (Risk as Feeling, Risk as Analysis, and Total Risk). In addition, those three dimensions are associated with reduced levels of emotional awareness (EPS- Emotional Experience) and a tendency to systematically avoid stimuli that trigger the negative emotional experience (EPS- Avoidance). No data emerged in favor of a relevant relationship between risk perception and the ability to manage strong emotional experiences (EPS- Control).

Concerning stress related to the pandemic, it is found that a high level of acute stress (NSESSS) is slightly associated with high levels of Indirect Experience, Risk as Feeling, and with the Risk as Analysis and the Total risk. While is negatively associated with Direct Experience.

Correlations between Indirect experience and risk perception with the domains investigated by the OPQL show a small association between reduced quality of life in general (OPQL- Life in general) with increased Indirect experience, Risk as Feeling, Risk as Analysis, and higher Total Risk perception. Instead, Direct experience was positively associated with OPQL's scale Life in general, which means that the more the subject has a direct experience of the pandemic the more find life pleasant in general. Perceptions of how safe the daily environments visited may be (OPQL- Home and neighborhood) also correlate positively and significantly with fear of the disease (Risk as Feeling).

Discussion And Conclusion

The purpose of this study was to investigate the relationship between the elderly experience of the pandemic and perceived risk with quality of life, acute stress, and emotional regulation of elderly subjects.

The results obtained confirm what was initially hypothesized: the perceived risk of COVID-19 contagion is related to a higher level of acute stress, poorer emotional regulation, and an important reduction in quality of life. The pandemic situation and, in particular, the fear of contagion seems to have left an important mark on older people. Indeed, when they show high levels of Risk as Feeling they manifest also high levels of acute stress. Thus, high risk perception may be an important peri-traumatic factor. What we have observed in our study is consistent with other contributions in the literature, showing that, due to the pandemic, young adults, healthcare personnel, and the general population manifest symptomatology compatible with some characteristics of post-traumatic stress disorder (Carmassi et al., 2020; Forte et al., 2020; Liu et al., 2020b). It should be noted, however, that our sample consists of twice as many female subjects as male participants.

The results show that fear and high Risk as Analysis are associated with an inability of the elderly to adequately regulate their emotional states. It is conceivable that acute stress and risk perception, in addition to being strongly interdependent, its greatly related to emotional regulation. It could be hypothesized that increased risk perception is part of a constellation of anxious traits, which is intrinsically linked to ineffective emotion management, (Notebaert et al., 2016) rooted in an underlying anxious disposition (Kallmen, 2000). The association between trait anxiety and risk perception has also been reported in the context of previous epidemics (Leung et al., 2003), and is consistent with theoretical hypotheses that assume that trait anxiety increases the propensity of individuals to perceive themselves as at risk of negative outcomes (Maner & Schmidt, 2006; Stöber, 1997) with a predisposition to worry and negatively evaluate the future (Stöber, 1997). It can be assumed that higher perceived risk is associated with more pathological emotional coping traits.

From our study relationship emerges between the perception of risk and how people are aware of the virus. Direct experience with people affected by the virus seems to mitigate emotional regulation, perceived acute stress, and life in general. As pointed out by Siebenhaar et al. (2020), while exposure to epidemic-related information can lead to adequate risk perception (Garfin et al., 2020), it is also true that excessive and/or inconsistent information can cause negative feelings about the perceived risk for health conditions (Cava et al., 2005). Our study confirms work already present in the literature, media exposure to information about COVID-19 played a crucial role in increasing risk perception and anxiety during the pandemic (Liu et al., 2020a) as an effect of an infodemic co-evolving with the virus (Gallotti et al.2020). A recent study by Liu et al. (2020a) showed that media exposure to information about COVID-19 played a crucial role in increasing perception of risk and anxiety during the pandemic (Liu et al.,2020a). The poor relationship between indirect experience and risk perception, constitute an additional variable that can be negatively associated with psychological well-being and, therefore, the aspects measured in our research, such as acute stress and the ability to regulate one's emotional states. The first limitation of the present study is that the sample was not controlled for gender unbalance. In fact, the results could be influenced by the gender variable, as some studies show that females are more susceptible to developing symptoms typical of PTSD (Hu et al., 2017). A second limitation consists of an imbalance in the years of schooling, with most individuals showing a high education level. This source of bias could have an impact on the results and on the generalizability of the study. Indeed, it has been highlighted by the literature that educational level has some influence on the implementation of protective behaviors, risk perception, factual knowledge about the virus, and the source of information consulted (Rattay et al., 2021).

All variables that could influence the levels of stress or the quality of life. Future studies should consider a sample with a larger and more representative educational level to investigate the complex relationships among different factors. A third limitation is that Indirect experience and Risk as Analysis were strongly unreliable for the first one and questionable for the second one, and it could have affected the results. Therefore, future studies should consider a more reliable measure of those constructs.

In conclusion, this work has shown that risk perception is strongly associated with acute stress. Moreover, risk perception seems to be strongly related to quality of life of older people and appears to worsen emotional regulation capacity conditioning, to a greater or lesser extent, decision-making processes under risky conditions (Butler & Mathews, 1987; Gasper & Clore, 1998; Kallmen, 2000). Future research assessing direct consequences and indirect effects on mental health is highly needed to improve treatment, mental health planning, and preventive measures during potential subsequent pandemics (Vindegaard & Benros, 2020). Future studies will therefore be responsible for investigating the effect of this pandemic more thoroughly and from a longitudinal perspective, which would allow us to further investigate if risk perception is influenced by experience or not. If this is the case, it would reinforce the idea that risk perception represents a manifestation of an anxious personality trait. Moreover, they should investigate the mediation role of emotion regulation between direct and indirect experience and Risk as Feeling.

Author Contributions

The authors discussed the contents of this article together. Lina Pezzuti and Monica Figus conceptualized the study elaborated on the research design and hypotheses, and contributed to the interpretation of research findings. Lina Pezzuti collected data. Lina Pezzuti and James Dawe devised the methodological content, analyzed the data, and contributed to the interpretation of research findings. Monica Figus and James Dawe contributed to writing and editing of this paper and collected the references, and wrote the final version of this paper

Conflict of interest
We confirm that we have no conflict of interest in this research.

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Ethical approval
The research has been approved by the ethical committee board of the University of Rome "La Sapienza".

Data availability statement
The data that support the findings of this study are available from the corresponding author, James Dawe, upon reasonable request.

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