**Title**

Somatisation and COVID-19 related PTSD symptoms: The role of hyperarousal

**Brief Title**

PTSD and somatisation

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**Abstract**

*Background:* Somatisation is commonly associated with histories of trauma and PTSD symptoms. Although previous research has demonstrated that PTSD symptoms predict somatic symptoms, there has been no systematic examination of this at the level of symptom clusters for COVID-19 related PTSD and multi-dimensional assessment of somatic symptoms.

*Aim:* It was aimed to test for an association between ICD-11 PTSD symptom clusters, with COVID-19 as the stressor, and somatic symptoms while controlling for potentially confounding variables.

*Method:* Participants were a nationally representative sample of 1,041 adults from the general population of the Republic of Ireland. Participants completed the PHQ and ITQ. Descriptive analyses were undertaken. A confirmatory factor analysis was conducted controlling for potentially confounding variables.

*Results:* All ICD-11 PTSD symptom clusters predicted the presence of pain, fatigue, gastro-intestinal, and cardiovascular symptoms in the PHQ. Sense of Threat individually predicted all physical health variables, and Avoidance predicted pain.

*Conclusions:* The study demonstrates the key role of sense of threat in the presence of COVID-19 trauma and somatisation. Findings suggest that interventions that tackle sense of threat might provide relief from somatisation.

**Keywords:** PTSD; Somatisation; Hyperarousal; Pandemic; Trauma; Physical health

**Introduction**

The experience of psychological distress in the form of physical symptoms without a known organic cause is known as somatisation and it can cause significant impairment to quality of life leading to repeated presentations to primary care settings [1]. The course of illness is often associated with a prolonged history of unenlightening medical investigations and treatments followed by a referral to psychiatric services. Co-morbid psychological disorders to somatisations is a contentious issue; many researchers identify that somatisation disorders are strongly but not exclusively linked to anxiety and depression [2], while others question the limited assumption of Western mind-body dualism that one causes the other, and the appropriateness of applying this conceptualisation across languages and cultures [3]. In an effort to increase the clinical utility of a diagnosis and refocus clinicians away from causation and towards the distress of the experiences, the ICD-11 redefined somatisation problems as Bodily Distress Disorder [4].

Somatisation has been repeatedly associated with a wide range of psychological disorders such as Posttraumatic Stress Disorder (PTSD). There are three criteria for a diagnosis of ICD-11 PTSD; re-experiencing of the trauma in the here and now through flashbacks and/or nightmares, avoidance of reminders of the trauma, and a sense of current threat often presented by excessive hyper-vigilance [4]. PTSD has been strongly associated with poor physical health and the presence of medical conditions [5] which is not surprising considering the disturbing impact of PTSD symptoms on sleep [6], the self-medicating use of alcohol and substances to supress flashbacks and to cope with interpersonal contact [7]. A large meta-analysis also found that individuals with PTSD were much more likely to be obese, to have poorer diets, to smoke, and to exercise less than the general population [8]. The impact of trauma and PTSD on physical health is pervasive and complex, and is an important context within which to explore the relationship between PTSD and somatisation.

A comprehensive meta-analysis into the relationship between trauma, PTSD, and somatic syndromes found that individuals exposed to a traumatic event were 2.7 times more likely to meet criteria for a somatic syndrome such as fibromyalgia, chronic pain, chronic fatigue, irritable bowel syndrome, or temporomandibular disorder [9]. This finding was regardless of trauma type or the age of trauma exposure. Karatzias et al. [10] evaluated the trauma histories and symptomatology between those with organic neurological disorders and those with functional, or unexplained, neurological disorders. Childhood trauma, specifically physical neglect and sexual abuse, predicted those in the unexplained symptoms group. This group also scored significantly higher on emotional dysregulation, stress, anxiety, and post-traumatic stress. Naturally, having significant unexplained ailments would cause psychological distress over time and it can be complicated to decipher whether somatisation is caused by or is the cause of psychological difficulties.

One avenue for understanding the relationship between trauma and somatisation is through observing the impact of psychological treatments on somatisation symptoms. Psychogenic Non-Epileptic Seizures (PNES) are another form of somatisation that have been associated with greater trauma exposure and in particular with histories of sexual and physical abuse [11]. Fascinatingly, in a small trial (n=18) which used prolonged exposure therapy for those with PTSD and PNES, 81% of treatment completers (n=16) documented a cessation of seizures by the end of therapy as well as a reduction in PTSD and depression symptoms [12]. There is a clear, albeit not well understood, relationship between trauma, PTSD and physical manifestations of distress. Further understanding of the mechanisms of change would enable clinicians to identify those in need and direct effective interventions more quickly.

As somatisation is linked to adverse events and PTSD it is particularly pertinent to understand amidst times of societal distress, such as in the COVID-19 pandemic. This has been a global crisis in which societies were required to respond to a life-threatening disease incredibly quickly. COVID-19 pandemic has necessitated dramatic lifestyle changes such as social isolation and taking significant precautions against exposure and transmission of coronavirus. Individuals with PTSD are uniquely affected by these circumstances. In particular, the global uncertainty and risk of viral transmission could have a significant impact on levels of hyperarousal or sense of threat in those who are traumatised. Hyperarousal can sensitise individuals to stressors which are of increased intensity and frequency during a pandemic. Hyperarousal alone has been identified as a key predictor of the other core PTSD symptoms of avoidance and re-experiencing, of developing chronic PTSD and of poor response to treatment [13-14].

One study on trauma-exposed war civilians demonstrated that hyperarousal and avoidance partly mediated the relationship between trauma exposure and somatic symptoms [15]. It could be hypothesised that in the context of COVID-19, increased hyperarousal might drive an increase in other post-traumatic sequelae and somatisation. Somatisation symptoms experienced by individuals with PTSD could theoretically be adversely affected by elevations in stress and hyperarousal. Additionally, physical health behaviours could likely be changed during COVID-19 social isolation. Stress and isolation might lead to further reductions in physical activity, sleep impairment, poorer diet, and an increase in maladaptive coping behaviours such as smoking or substance use. As a virus which causes physical symptoms is the key threat, the elevated attention to threat in PTSD [16] may additionally influence the experience of physical symptoms during the pandemic.

Although there is an emerging understanding of the relationship between PTSD symptoms and somatisation, there is a need to further delineate which particular symptom clusters drive this relationship. Previous research tends to analyse at the disorder level, i.e. presence of PTSD or physical symptoms, whereas analysis at the symptom-level provides more insight into the nature of this relationship. Based on previous research, there is a particular need to unpick the role of chronic hyperarousal on the development and maintenance of somatisation. This would inform how to target interventions for specific groups and improve their efficacy. To date, it is unknown how individuals with COVID-19 PTSD symptoms express somatisation symptoms.

Although previous research has demonstrated that PTSD symptoms predict somatic symptoms, there has been no systematic examination of this at the level of symptom clusters for ICD-11 PTSD and multi-dimensional assessment of somatic symptoms. Furthermore, the extant evidence of the severity of PTSD symptoms in the general population, and their association with other psychological variables, in Western countries during pandemic quarantine is sparse. The primary aim of this study was to test for an association between ICD-11 PTSD symptom clusters, with COVID-19 as the stressor, and somatic symptoms while controlling for potentially confounding variables. It was predicted that there would be a positive association between all symptom clusters and different forms of somatic symptoms, and there is some evidence that sense of threat, or hyperarousal, symptom cluster may have the largest effect.

**Methods**

An online research panel representative of the general adult population of the Republic of Ireland was used to recruit 1,041 participants using stratified quota sampling to ensure that the sample characteristics of sex, age, and region of Ireland matched known population parameters from the 2016 Irish census. Data collection was from 31st March 2020 (31 days after the first confirmed case of COVID-19 in the Republic of Ireland, 19 days after the first physical distancing measures were enacted, and two days after it was announced that people were not to leave their homes) until 5th of April 2020. Participants had to be aged 18 years or older at the time of the survey and be able to complete the survey in English. Participants were contacted by the survey company, Qualtrics, via email with an offer to participate. Consenting participants completed the survey online (median time of completion = 37.52 minutes) and were reimbursed by the survey company for their time. Ethical approval for the study was granted by the ethical review boards of the University of Sheffield and Ulster University. The sample characteristics are presented in Table 1.

**Measures**

*Demographic information*

Self-reported gender and age were recorded.

*Pre-existing health problems*

Participants were asked “Were you diagnosed with a health condition (e.g. heart or lung disease; diabetes; cancer) before December 31st 2019 (i.e. before the start of the coronavirus COVID-19 outbreak)?” and the response options were ‘Yes’ (1) and ‘No’ (0).

*Income*

Participants were asked “Please choose from the following options to indicate your approximate gross (before tax is taken away) household income in 2019 (last year). Include income from partners and other family members living with you and all kinds of earnings including salaries and benefits” to choose one of 10 categories: “0-€19,999, €20,00-€29,999, €30,000-€39,999, €40,000-€49,999, €50,000-€59,999, €60,000-€69,999, €70,000-€79,999, €80,00-€89,999, €90,000-€99,000, €100,000 or more”.

*PTSD symptoms*

Participants completed the International Trauma Questionnaire (ITQ) [17].

The ITQ is the only self-report measure of ICD-11 PTSD and CPTSD symptoms.11 Six symptoms and three items assessing functional impairment were used to assess PTSD. Participants indicate how much they have been bothered by each of their core symptoms in the past month, considering their most traumatic event, using a five-point Likert scale ranging from ‘not at all’ (0) to ‘extremely’ (4). Two symptoms reflect the ‘re-experiencing’ cluster (i.e., upsetting dreams and feeling the experience is happening again in the here and now), the ‘avoidance’ cluster (internal reminders and external reminders) and the ‘sense of threat’ cluster (hypervigilance and exaggerated startle response). Three items screened for functional impairment associated with relationships and social life, work or ability to work, and other important aspects of life, such as parenting, school/college work or other important activities. Diagnostic criteria for PTSD require a score of ≥2 (‘moderately’) for at least one of two symptoms from each of the re-experiencing, avoidance and threat clusters, and at least one functional impairment item to be endorsed (≥2).

*Somatic symptoms*

Somatic symptoms were measured using the Patient Health Questionnaire (PHQ-15) [18]. The PHQ-15 is a 15-item self-report measure that asks participants, “Over the last 2 weeks, how often have you been bothered by any of the following problems?” and lists 15 commonly reported physical complaints. The response options are “Not bothered at all” (0), “Bothered a little” (1), and “Bothered a lot” (2). The scale was scored using the factor analytic based multi-dimensional approach proposed by Cano-García et al. [19]: summed scores were created to represent pain symptoms (1. back pain, 2. pain in arms, legs, or joints, 3. headaches) gastrointestinal symptoms (1. stomach pain, 2. pain or problems during sexual intercourse, 3. constipation, loose bowels, or diarrhea, 4. nausea, gas, or indigestion), cardiopulmonary symptoms (1. chest pain, 2. Dizziness, 3. feeling your heart pound or race, 4. shortness of breath), and fatigue symptoms (1. trouble sleeping, 2. feeling tired or having low energy). The ‘menstrual problems’ item was excluded due to its gender-specific nature that would preclude analysis of the entire sample. Item 9 (fainting spells) was also excluded as it had previously been found to have low endorsement rates [20]. A total scale score, of the 13 items, was also computed.

**Analysis**

Descriptive statistics were calculated, means and SD for continuous variables and counts and percentages for categorical variables, and correlations were estimated. The main analyses were conducted in three stages as proposed by Anderson and Gerbing [21]. First, a confirmatory factor analysis (CFA) measurement model was specified to assess the fit of the ITQ and PHQ. The six ITQ items were specified as measuring three latent variables (Re-experiencing, Avoidance, and Sense of Threat) and the 13 PHQ items were specified as measuring four latent variables (Pain, Gastro(intestinal), Cardio(pulmonary), Fatigue). Each item was specified to load only on its respective factor, all factors were allowed to correlate and the unique variances were all uncorrelated. Second, the ITQ latent variables were specified to predict each of the PHQ latent variables and the control variables were also introduced to the model (age, gender, health and income were added as predictors of the PHQ latent variables). The ITQ latent variables and the control variables were correlated and the unique variances were all uncorrelated. This model is presented in Figure 1. Third, the final model replaced the four PHQ latent variables with a single summed score of the 13 PHQ items to represent general somatisation.

Figure 1 about here

All the models were specified and estimated using Mplus 8.1 [22] using robust maximum likelihood [23]. The fit of the models were assessed using standard criteria: a non-significant chi-square (χ2) test, Comparative Fit Index (CFI) [24] and Tucker Lewis Index (TLI) [25] values greater than .90; Root-Mean-Square Error of Approximation (RMSEA) [26] with 90% confidence intervals (RMSEA 90% CI); and Standardized Root-Mean-Square Residual (SRMR) values of .08 or less reflect acceptable model fit [27].

**Results**

Table 1 shows the bivariate correlations among the study variables. The ITQ symptoms clusters were positively correlated (r = .646 - .781) as were the PHQ subscales (r = .459 - .867), and the correlation among these were positive, moderate and statistically significant (r = .282 to .371). The 2 factor CFA of the ITQ and PHQ items was acceptable in terms of model fit (*χ2* (131)= 281.506, *p* < .001; RMSEA = .033, 90% C.I. = .028 - .039; CFI = .974; TLI = .966; SRMR = .034).

Table 1 about here

The fit of the model latent variable model with ITQ latent variables predicting PHQ latent variables was acceptable (χ2 (179)= 409.893, p < .001; RMSEA = .035, 90% C.I. .031 - .040; CFI = .966; TLI = .952; SRMR = .034). The estimates are presented in Table 2. The Sense of Threat symptom cluster was a significant predictor of all PHQ subscales, and Avoidance also predicted pain (β=.347)

Table 2 about here

**Discussion**

We sought to explore whether COVID-19 related PTSD symptom clusters were specifically associated with multi-dimensional somatisation variables. It was found that the PTSD sense of threat symptom cluster significantly predicted all PHQ subscales, and avoidance was found to significantly predict the presence of pain. Re-experiencing did not individually predict any of the health outcomes measured. Results highlight the role of hyperarousal in experiencing symptoms of somatisation. These findings extend previous research on the specific role of sense of threat, or hyperarousal, on somatisation using a population based sample. Hyperarousal is increasingly recognised as potentially the driving symptom in the development and maintenance of PTSD [13] and the present study supports these findings. Chronic hyperarousal in PTSD is understood to alter the stress response of the body via the Hypothalamic-Pituitary-Adrenal (HPA) axis [28]. A previous meta-analysis by Miller et al. [29] discussed that chronic stress from traumatic experiences can lead to poor physical health. Dysfunction in the HPA axis has been associated with somatic syndromes including irritable bowel syndrome [30], low cortisol in chronic fatigue [31], pathway sensitisation in chronic pain [32], and reduced adrenal activity in fibromyalgia [33]. Both chronic hyperarousal and somatic symptoms are strongly associated with HPA-axis dysfunction and the present findings indicate the role of the PTSD sense of threat symptom cluster in the presentation of somatic symptoms.

Clinically, for those presenting with somatisation and experiencing PTSD symptoms it may be useful to tackle chronic states of arousal. A review on CBT interventions for PTSD which also measured the impact on somatic symptoms reported reductions in medically unexplained symptoms, self-reported physical ill health, and levels of chronic pain 35 [34]. A study on combat veterans with PTSD demonstrated that by adding in controlled breathing to treatment resulted in physiological changes in Heart Rate Variability, a proxy for the autonomic nervous system function, and significantly improved response to treatment than those not in the breathing condition [35]. For those presenting to trauma-specific psychological services it may indicate a benefit to focus on soothing the threat system during initial stages of therapy if somatisation symptoms are prominent. At a service level, one approach which aims to increase a sense of safety in patients is the development of trauma-informed care [36]. This approach recognises the pervasive impact trauma can have on an individual’s sense of threat and beliefs about themselves, others, and the world. Medical settings may enhance an individual’s sense of threat if they have previous experienced trauma and are now experiencing distressing physical symptoms. For example, long periods in busy, loud waiting areas, being intimately physically assessed by a stranger in a position of power, or awaiting test results may all heighten the arousal system and potentially contribute to somatisation symptoms [37]. Clinical interventions that might benefit from recognising the impact of hyperarousal on somatic symptoms and engagement in medical care would be to redesign services in line with a trauma-informed care approach.

The finding that avoidance predicts pain symptoms is particularly pertinent in the context of COVID-19 quarantine. Avoidance of trauma reminders may be inadvertently enforced during societal lockdown. If the mechanism by which avoidance predicts pain is reduced physical activity, then reduced activity in lockdown might anticipate an increase in pain symptoms. The Perpetual Avoidance Model [38] posits that hyperarousal may increase pain sensations and reinforce maladaptive beliefs that activities will be painful leading to increased avoidance. This inactivity is theorised to increase perceived pain sensation which feeds into further inactivity. The authors suggest a focus of psychological interventions should be to reduce the avoidance which mutually maintains PTSD and pain symptoms. Furthermore, using relaxation and breathing exercises as biofeedback strategies to reduce perceived pain and increase a sense of control over the body.

The study suffers from a number of limitations including the use of self-reported scales and the lack of temporal data regarding the expression of PTSD and somatisation symptoms. Our results can also be generalised only in western cultures. As mentioned previously, physical health problems are understood and experienced uniquely across cultures, and so the present findings must be understood within a Western context. For instance, studies have identified that refugee population report increased medically unexplained symptoms as compared to the general Western population [39]. Furthermore, physical health behaviours are known to be adversely affected in those with PTSD, in that sufferers are significantly more likely to have poor sleep, poorer diets, reduced levels of exercise, and increased levels of obesity, smoking, and substance abuse [8]. These factors will all impact on physical health and the body stress response. Thus it is a limitation of the current study that physical health behaviours were not controlled for in analysing the relationship between PTSD symptoms and somatisation symptoms. Furthermore, there is evidence that physical health problems differ for those exposed to different types of trauma, such as torture survivors [38], although this study only dealt with COVID-19 related PTSD symptoms. Hyperarousal has been theorised to sensitise the threat system to future traumas, increasing the physiological response to subsequent stressors [40] and so multiple trauma exposure may be another complicating factor which unfortunately was not considered in the present study.

Future research is required to expand upon these findings by looking at whether this relationship holds true across the types of trauma, such as physical, sexual, emotional, neglect, multiple traumatisation, and the age at which these were experienced. Furthermore, the time since trauma may be an important factor to focus on as it could be hypothesised that the longer an individual has been in a state of hyperarousal may have a stronger association with somatisation symptoms. Although the relationship between hyperarousal and somatisation is becoming clearer, the mechanism by which this occurs is not yet known. Further research, which assesses the biomarkers of hyperarousal, as well as including potential moderators such as levels of physical activity, health behaviours, substance use, and sleep, may help to outline this relationship further and therefore target interventions more effectively.

In conclusion, the current findings demonstrate the relationship between ICD-11 PTSD symptom clusters and multidimensional somatic symptoms. It highlights the key role of sense of threat in predicting the presence of unexplained physical ailments, and also points to a significant relationship between avoidance and pain. Conducting this study in the context of COVID-19 pandemic is significant. There is little evidence on the presentation of PTSD symptoms during societal quarantine and the relation of these to somatic symptoms. Our findings indicate the importance of the stress response, avoidance, and physical inactivity in this relationship. Through understanding of the underlying processes driving the relationship between trauma and somatisation we can develop and refine effective interventions to alleviate the mental and physical suffering in this population.

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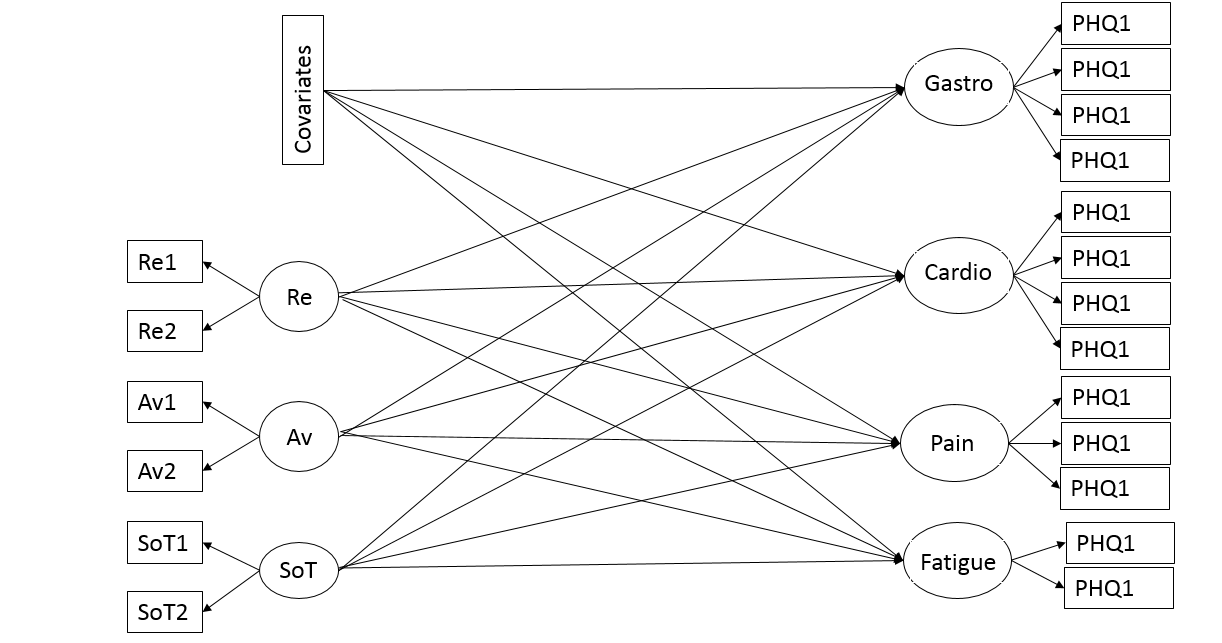
Table 1. Descriptive Statistics and Correlations for all Main Study Variables.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Age | Gender | Income | Health | Re | Av | SoT | Pain | Gastro | Cardio | Fatigue | Total PHQ |
| Gender | -.145\*\* | 1.000 |  |  |  |  |  |  |  |  |  |  |
| Income | .073\* | -.163\*\* | 1.000 |  |  |  |  |  |  |  |  |  |
| Health | .171\*\* | -.015 | -.069\* | 1.000 |  |  |  |  |  |  |  |  |
| Re | -.320\*\* | .050 | .030 | .026 | 1.000 |  |  |  |  |  |  |  |
| Av | -.324\*\* | .000 | .031 | .027 | .781\*\* | 1.000 |  |  |  |  |  |  |
| SoT | -.304\*\* | .028 | -.006 | .038 | .646\*\* | .692\*\* | 1.000 |  |  |  |  |  |
| Pain | -.086\*\* | .113\*\* | -.005 | .184\*\* | .282\*\* | .303\*\* | .311\*\* | 1.000 |  |  |  |  |
| Gastro | -.270\*\* | .106\*\* | .025 | .133\*\* | .321\*\* | .331\*\* | .340\*\* | .557\*\* | 1.000 |  |  |  |
| Cardio | -.204\*\* | -.011 | .033 | .184\*\* | .371\*\* | .364\*\* | .358\*\* | .582\*\* | .639\*\* | 1.000 |  |  |
| Fatigue | -.172\*\* | .175\*\* | -.080\* | .142\*\* | .298\*\* | .285\*\* | .330\*\* | .459\*\* | .539\*\* | .394\*\* | 1.000 |  |
| Total PHQ | -.230\*\* | .119\*\* | -.005 | .198\*\* | .393\*\* | .398\*\* | .414\*\* | .810\*\* | .867\*\* | .810\*\* | .726\*\* | 1.000 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Mean | 44.97 |  |  |  | 1.481 | 1.487 | 2.103 | 1.173 | 1.227 | .599 | 1.202 | 4.203 |
| SD | 15.76 |  |  |  | 2.024 | 2.051 | 2.215 | 1.421 | 1.615 | 1.294 | 1.231 | 4.494 |

Table 2. Standardised Regression Coefficients (β) for Model Predicting Somatic Symptoms.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Gastro | Cardio | Fatigue | Pain | Total PHQ |
|  |  |  |  |  |  |
| Age | -0.161\*\*\* | -0.139\*\*\* | -0.066 | -0.006 | -0.100\*\* |
| Gender | 0.045 | 0.012 | 0.182\*\*\* | 0.178\*\*\* | 0.107\*\*\* |
| Health | 0.155\*\*\* | 0.230\*\*\* | 0.160\*\*\* | 0.188\*\*\* | 0.200\*\*\* |
| Income | 0.082\* | 0.025 | -0.048 | 0.016 | 0.021 |
| Re-experiencing | 0.033 | 0.201 | 0.120 | -0.169 | 0.056 |
| Avoidance | 0.127 | -0.031 | -0.059 | 0.347\* | 0.107 |
| Sense of Threat | 0.234\*\*\* | 0.239\*\* | 0.332\*\*\* | 0.254\*\* | 0.279\*\*\* |
|  |  |  |  |  |  |
| R-squared | 0.238\*\*\* | 0.259\*\*\* | 0.246\*\*\* | .256\*\*\* | .273\*\*\* |
|  |  |  |  |  |  |

Figure 1. Latent Variable Model with PTSD Symptom Clusters Predicting Somatic Symptom Clusters.



**Table 1.** Sociodemographic characteristics of the Republic of Ireland sample.

|  |  |
| --- | --- |
|  | % |
| **Sex** |  |
| Female | 51.5 |
| Male | 48.2 |
| **Age** |  |
| 18-24 | 11.1 |
| 25-34 | 19.2 |
| 35-44 | 20.6 |
| 45-54 | 15.9 |
| 55-64 | 21.0 |
| 65+ | 12.2 |
| **Birthplace** |  |
| Ireland | 70.7 |
| **Region of Ireland** |  |
| Leinster | 55.3 |
| Munster | 27.3 |
| Connaught | 12.0 |
| Ulster | 5.4 |
| **Ethnicity** |  |
| Irish | 74.8 |
| Irish Traveller | 0.3 |
| Other White background | 17.3 |
| African | 1.9 |
| Other Black background | 0.3 |
| Chinese | 0.4 |
| Other Asian | 3.2 |
| Mixed Background | 1.8 |
| **Living location** |  |
| City | 24.5 |
| Suburb | 18.1 |
| Town | 26.8 |
| Rural | 28.8 |
| **Highest Education** |  |
| No qualification | 1.2 |
| Finished mandatory schooling | 6.4 |
| Finished secondary school | 22.4 |
| Undergraduate degree | 22.5 |
| Postgraduate degree | 19.8 |
| Other technical qualification | 27.9 |
| **2019 income** |  |
| 0-€19,999 | 24.6 |
| €20,000-€29,999 | 21.3 |
| €30,000-€39,999 | 19.5 |
| €40,000-€49,999 | 12.7 |
| €50,000+ | 21.9 |
| **Employment status** |  |
| Full-time (self)/employed | 43.3 |
| Part-time (self)/employed | 15.7 |
| Retired | 15.0 |
| Unemployed | 8.4 |
| Student | 6.3 |
| Unemployed (disability or illness) | 5.6 |
| Unemployed due to COVID-19 | 5.7 |
| **Religion** |  |
| Christian | 69.8 |
| Muslim | 1.6 |
| Jewish | 0.2 |
| Hindu | 1.1 |
| Buddhist | 0.6 |
| Sikh | 0.1 |
| Other religion | 3.8 |
| Atheist | 15.3 |
| Agnostic | 7.5 |
| **Lone adult in household** |  |
| Yes | 18.4 |
| **Children in the household** |  |
| Yes | 39.7 |