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Final dissertation

Validating the Italian version of Beliefs About Losing Control Inventory: Assessing its Psychometric Properties

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Abstract

In the past years, the critical role of cognitive aspects of obsessive-compulsive disorder (OCD) has been investigated. When it comes to OCD, it is crucial to explore the fear of losing control as a critical element of cognition, among several others. The existing experimental evidence essentially indicates that beliefs play a role in either worsening or alleviating symptoms of OCD. Relatedly, Radomsky and Gagné (2020) introduced the Beliefs About Losing Control Inventory (BALCI), the first self-report tool for examining OCD-related negative beliefs. It found strong psychometric evidence for three factors: 1) “negative beliefs about losing control over one's thoughts, behavior, and emotions (TBE), 2) the importance of staying in control (ISC), and 3) body/bodily functions (BBF)”. This study aimed to adapt and validate the Beliefs About Losing Control Inventory (BALCI) for non-clinical Italian adults using Confirmatory Factor Analysis (CFA). 325 participants were enrolled in two study phases; most were females between 18 and 32. A preliminary EFA analysis was conducted to ensure the validity of the structure of the BALCI within Italian population. Then, a CFA was conducted using Mplus 7 software to assess the model fit for the adapted BALCI version. The results indicated that the BALCI Italian Version validated 21 items in the three mentioned factors ($\chi2 = 459.671$, $\chi2/df = 2.47$, CFI = 0.93, TLI = 0.92, RMSEA = 0.06). The Italian version of BALCI demonstrated excellent scale score reliability with a McDonald's omega of .95, along with a test-retest correlation of. .56; These results underscore the BALCI Italian version's trustworthiness for use by Italian academics and mental health practitioners.

Chapter 1. Introduction

1.1. Background and Historical Evolution of Obsessive-Compulsive Disorder (OCD)

1.1.1. Characteristics and Manifestations

Obsessive-Compulsive Disorder (OCD) is a complicated mental health illness that has long confounded physicians and researchers alike. OCD is defined by the American Psychiatric Association (APA, 2013) as a condition characterized by persistent, intrusive thoughts (obsessions) and ritualistic actions or mental acts (compulsions). It comprises a wide range of symptoms that have a significant influence on an individual's everyday life. This section digs into the key characteristics and manifestations of OCD, setting the framework for a full understanding of the condition and its historical progression. The interaction of obsessive thoughts and compulsive behaviors is at the heart of OCD. Obsessions are recurring and painful ideas, visions, or urges that penetrate an individual's consciousness, causing severe anxiety or discomfort (Rachman, 1997). Compulsions, on the other hand, are recurring behavioral or mental activities undertaken in reaction to these obsessions. The compulsive character of these behaviors is a hallmark of OCD—individuals feel compelled to perform them to ease the discomfort produced by their obsessions (APA, 2013).

1.1.2. Common Obsessions and Compulsions

Obsessions encompass a wide range of topics, including contamination worries, anxieties about causing harm, concerns with symmetry and order, and intrusive ideas that violate personal or cultural norms (Ruscio et al., 2010). Compulsions are shown as overt activities (e.g., washing, checking) or covert mental acts (e.g., counting, praying) intended to prevent or alleviating the suffering caused by the obsessions (APA, 2013).

1.1.3. Severity and Impact on Daily Functioning

OCD severity ranges from moderate to severe, but its influence on daily functioning is frequently profound. Individuals suffering from OCD can devote a large portion of their day to obsessive thoughts and compulsive rituals, causing disturbances in relationships, vocational activities, and general quality of life (Fontenelle et al., 2011). Recognizing the severity of OCD is critical for developing evaluation instruments that capture the full range of symptoms.

1.1.4. Beyond Obsessions and Compulsions: Underlying Cognitive Processes

While obsessions and compulsions are obvious indications of OCD, underlying cognitive processes are crucial in the maintenance of symptoms. These cognitive processes include inaccurate beliefs, unreasonable fears, and poor assessment mechanisms, all of which contribute to the persistence of obsessive-compulsive behaviors. One such cognitive factor that deserves special emphasis in comprehending the larger spectrum of OCD manifestations is the fear of losing control (APA, 2013; Tolin et al., 2003).

1.1.5. Comorbidity and Heterogeneity

OCD rarely exists in isolation, often co-occurring with other mental health conditions such as depression, anxiety disorders, and attention-deficit/hyperactivity disorder (Abramowitz et al., 2010). This comorbidity adds complexity to the clinical presentation of OCD, and recognizing these coexisting conditions is crucial for tailoring assessment tools to the unique needs of individuals. Moreover, OCD displays a considerable degree of heterogeneity, with individuals presenting unique symptom profiles and responses to treatment (Simpson et al., 2013). Acknowledging this diversity is essential for designing

assessment tools that capture the multifaceted nature of OCD.

1.2. Theoretical Framework

Obsessive-Compulsive Disorder (OCD) has evolved in its understanding and conceptualization throughout the years. This detailed analysis digs into the historical milestones, diagnostic criteria shifts, and significant theories that have defined OCD research's trajectory.

1.2.1. Early Descriptions and Lack of Systematic Framework

In the early nineteenth century, there were scattered accounts of what we now call OCD symptoms under titles such as "compulsive insanity" and "obsessional neurosis" (Berrios, 1996). However, these early accounts lacked a systematic and consistent diagnostic framework, which hampered a thorough understanding of the condition (APA, 2013).

1.2.2. Cognitive Models in the Late 20th Century

The advent of cognitive models in the late twentieth century signaled a paradigm shift. Cognitive-behavioral theories were developed by visionaries such as Aaron Beck to explain OCD, emphasizing cognitive distortions and poor assessment mechanisms (APA, 2013; Clark, 2004). This cognitive shift widened the scope of OCD research beyond simply behavioral approaches.

1.2.3. Neurobiological Advances and DSM-5

From the late twentieth century to the present, advances in neuroscience, neuroimaging, and genetics have expanded our understanding of the neurological foundations of OCD. The serotonin theory gained traction, which resulted in the introduction of selective serotonin reuptake inhibitors (SSRIs) as a key pharmaceutical intervention (APA, 2013;

Goodman et al., 1989). The 2013 release of the DSM-5 reflects continuous efforts to capture the various forms of OCD within a nuanced diagnostic framework (APA, 2013).

1.2.4. Contemporary Perspectives: Integration of Models

An integrative approach to OCD research, combining cognitive, behavioral, and neurobiological approaches, is prevalent nowadays. The emphasis has turned to identifying specific cognitive processes and elucidating specific cognitive dysfunctions that are at work in OCD. A) Exaggerated Responsibility: People with OCD frequently believe they are responsible for averting harm or catastrophic situations (Salkovskis, 1985). This cognitive distortion causes compulsive activities to be performed in order to avoid perceived undesirable results. Someone with OCD, for example, may assume that failing to check the stove on a regular basis will result in a home fire, driving them to participate in ritualistic checking. B) Threat Overestimation: People with the illness regard events as more threatening than they are (Rachman, 1997). Someone who is obsessed with contamination, for example, may overestimate the probability of acquiring a severe illness from minor contact. Compulsive habits such as excessive handwashing are fueled by this cognitive distortion. C) Uncertainty Intolerance: Uncertainty Intolerance is a cognitive process that greatly contributes to OCD. Individuals with OCD frequently find it difficult to tolerate ambiguity in situations, which leads to increased anxiety (Dugas et al., 1998). This cognitive impairment fuels compulsive actions that seek certainty. For example, someone suffering from OCD may repeatedly seek reassurance to reduce anxiety caused by obsessive concerns. D) Perfectionism and Symmetry; Some people become upset when things aren't properly or symmetrically arranged (Frost et al., 1993). In this context, compulsions are defined as repetitive

arranging or organizing activities that are performed to reduce the discomfort associated with perceived defects. E) Magical Thinking: This is the assumption that one's thoughts have the ability to influence occurrences in the outside world. This cognitive process is especially important in cases of OCD, including religious or superstitious elements (Rachman, 1993). Individuals may participate in rituals to protect themselves against imagined damage, motivated by the mistaken idea that their thoughts have the ability to influence unfavorable consequences.

1.3. Significance of Assessing Beliefs About Losing Control in OCD

1.3.1. Control and loss of control

Obsessive-Compulsive Disorder (OCD) is inextricably tied to the concept of control, which serves as a key cognitive function in the disorder's expression (Abramowitz et al., 2014). The need to manage intrusive thoughts and prevent anticipated catastrophic outcomes is exacerbated in OCD (APA, 2013). This increased need for control frequently leads to compulsive behaviors aimed at restoring order and security (Steketee, 1993). The definition of control in the context of OCD differs from normative understandings. OCD appears as an excessive and unreasonable fear of losing control (Fontenelle et al., 2011). Individuals with OCD have an intense urge to exert control over their thoughts and actions in order to avoid perceived harm, which contrasts sharply with the common feeling of control in non-OCD populations. Individuals with OCD perform obsessive rituals to relieve anxiety caused by a perceived loss of control over their thoughts and to avoid anticipated consequences (Tolin et al., 2003). The fear of losing control becomes a major and distinguishing aspect of OCD. Individuals suffering from OCD frequently experience intrusive thoughts about inflicting damage to oneself or others as a result of a

perceived inability to regulate their behaviors (APA, 2013). Fear becomes a driving force behind compulsive actions as people try to restore control and avoid the feared results (Abramowitz et al., 2014). The fear of losing control, which is a core and distinguishing aspect of OCD, is intertwined with these discovered cognitive processes. Individuals struggle with intrusive thoughts, and their compulsive behaviors evolve into complicated strategies to restore control over perceived threats and feared outcomes (Tolin et al., 2003). The modern view of OCD emphasizes the delicate interplay between the fear of losing control and specific cognitive dysfunctions, leading therapy strategies that address these underlying cognitive processes (APA, 2013; Salkovskis & Bass, 1997). This holistic viewpoint not only increases our understanding of OCD but also informs specific interventions for individuals navigating the complexity of this condition.

Radomsky and Rachman (2014) investigate the complex link between memory biases, confidence levels, and a sense of responsibility in patients with obsessive-compulsive disorder (OCD) who demonstrate compulsive checking activities. Memory bias, defined as the selective recollection of information that supports pre-existing views or anxieties, leads to the dread of losing control. These biases are likely to exacerbate fears about potential damage or catastrophic events in the context of OCD.

Another critical factor studied by the authors is the impact of confidence in individuals with OCD who participate in compulsive checking. The dread of losing control is substantially influenced by one's level of confidence in the accuracy of one's actions or perceptions. The study most likely examines how individuals with OCD may lack trust in their abilities to avert imagined undesirable outcomes, leading to increased worry and the need for repetitive monitoring rituals. The issue of accountability is also addressed in the

context of compulsive checking. Individuals with OCD frequently struggle with an inflated sense of responsibility for preventing harm or guaranteeing the faultless performance of specified behaviors. This increased duty is inextricably tied to the fear of losing control, as individuals believe that failure to do these duties flawlessly will result in disastrous repercussions.

Individuals suffering from obsessive-compulsive disorder (OCD) frequently struggle with controlling their thoughts, instilling a profound fear of eventual loss of control across various domains such as thoughts, behavior, emotions, body, and bodily functions (Clark & Purdon, 1993; Carr, 1974; Reuven-Magril et al., 2008). Individuals with OCD, for example, frequently engage in avoidance behaviors, such as avoiding sharp objects, because they are afraid of acting on undesirable impulses (Rachman & Hodgson, 1980). Clark and Purdon's (1993) studies, as well as the OCD Collaborative Genetics Study (OCCWG, 1997), highlight the importance of beliefs about the likelihood, significance, consequences, and severity of losing control in the area of control-related cognitions in OCD.

Froreich et al. (2016) found a positive link between doubts about managing impulses/emotions and the severity of OCD symptoms, lending further credence to the essential role of worries about losing control. Haslam, Williams, Kyrios, McKay, and Taylor (2005) discovered that only an obsessional subtype with beliefs about the significance and control of thoughts met criteria as a distinct taxon, whereas subtypes with more dimensional characteristics included inflated responsibility, perfectionism, checking, and contamination. Experimental studies, such as those conducted by Myers and Wells (2013), show that changing metacognition, specifically the assumption that

regulating thoughts is necessary to avoid undesirable consequences, causes symptoms resembling obsessive-compulsive disorders. Further study has offered evidence in favor of beliefs' causal role in symptom aggravation (e.g., Arntz, Voncken, & Goosen, 2007; Lopatka & Rachman, 1995). Gagné and Radomsky (2017) made a substantial contribution to this domain by demonstrating that negative views about losing control were associated with increased OCD (checking) symptoms. Participants in this study who were made to believe they were more prone to losing control engaged in significantly more checking activities during a subsequent task.

1.3.2. Significance of Anxiety Sensitivity in OCD

Anxiety Sensitivity (AS), an important individual difference factor, has been studied for its role in mental health development and maintenance. AS is a lasting anxiety of arousal-related sensations caused by the tendency to interpret them catastrophically, believing they will have major bodily, psychological, or social implications. Psychometric studies support the premise that AS, as measured by the Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992), is a global construct with multiple lower-order variables specifying fear of specific anxiety symptoms and catastrophic consequences. The ASI factor structure with three lower-order factors—physical, cognitive, and social—is most consistent (Taylor, 1999). High physical worries scores indicate anxiety about the health effects of arousal experiences (e.g., heart palpitations causing a heart attack). High cognitive concerns include fears that psychological symptoms like focus problems could lead to mental incapacitation. Finally, fears that public anxiety symptoms will be judged or rejected raise high social concerns. These lower-order factors may reveal distinct ways via which AS makes some mental health

symptoms vulnerable. In an important study Raines and colleagues found a strong correlation between anxiety sensitivity and OCD subscales in healthy adults (Raines et al., 2014). In another study, Wheaton et al. (2012) assessed anxiety sensitivity and OCD symptoms in 636 non-graduate students. Additionally, the study assessed generalized anxiety disorder and cognitive impairment linked to OCD. Regression analysis indicates that anxiety sensitivity predicts OCD symptoms, even after controlling general anxiety and beliefs. Additionally, anxiety sensitivity (physical, social, and cognitive aspects) is linked to obsessive symptoms (contamination, infection, responsibility for harm, symmetry, and unacceptable thoughts). Ferreira et al. (2021) found that fear of negative emotions was associated with OCD symptoms, and anxiety sensitivity was a relevant core concept in OCD individuals (Ferreira S et al., 2021; Khakpour S et al. 2018). The role of AS and OCD symptoms seems to extends beyond an association as Blakey and colleagues (2017) found that baseline AS positively correlated with baseline OCD severity, and (b) greater baseline AS prospectively predicted higher posttreatment OCD symptom severity even after controlling for pretreatment OCD and depression severity.

1.3.3. Significance of the transdiagnostic role of beliefs about losing control

It has been shown in the literature that fear and beliefs about losing control are prevalent across a wide range of mental health disorders. This includes a wide range of psychological conditions, including but not limited to: anxiety disorders and their related conditions, impulsivity issues, eating disorders, and mood disorders. According to Harvey and colleagues (2004), a transdiagnostic framework that seeks to understand commonalities among various problems must include an examination of beliefs and fears related to losing control. With this method, we may be able to gain a better

understanding of these areas and maybe even direct interventions. There is hope that treatment approaches that target fears and beliefs about loss of control in relation to one particular problem could be effective in addressing many other issues if these approaches are proven to be effective.

1.3.3.1. Beliefs about losing control in Social Anxiety Disorder

As defined by the American Psychiatric Association in 2013, Social Anxiety Disorder (SAD), also known as Social Phobia, is characterized by marked fear or anxiety in social situations and/or in contexts where being scrutinized is possible. Fear of embarrassing oneself and losing control in social situations has been linked to SAD cases. Researchers Butler & Wells (1995), Clark & Wells (1995), Kelly-Turner & Radomsky (2020), and others have studied this phenomenon, and it has even been incorporated into symptom measures like those developed by Mattick & Clarke (1998). This fear of losing control is closely related to processes that have been shown to be maladaptive in SAD, like post-event processing and using safety behaviors. To avoid uncontrollably shaking their hands, people might, for example, tightly hold a glass or analyze their performance after social interactions, emphasizing the negative aspects (Clark & Wells, 1995). According to Clark and Wells' cognitive model, people with SAD may believe they are in danger of acting inappropriately, which implies that thoughts about losing control may be the root cause of SAD symptoms and processes. Increased anxiety in non-clinical samples has been associated with a greater sense of uncontrollability in social settings, especially when combined with the possibility of unfavorable social outcomes (Rapee, 1997). According to correlational research, people with high levels of social anxiety frequently believe they have little control over social circumstances, especially when it comes to

their feelings. Furthermore, regardless of the degree of social anxiety, confirming these beliefs strongly predicts overall anxiety levels (De Castella et al., 2014). According to research by Spokas et al. (2009), people with higher levels of social anxiety work harder to control their emotions, show a greater fear of expressing their feelings, and believe that emotions should be controlled more than people with lower levels of social anxiety. Furthermore, Hofmann (2005) found that the relationship between social anxiety and the perceived social repercussions of embarrassing events can be partially explained by perceived control over reactive anxiety and emotions.

People who seek treatment for social anxiety frequently describe symptoms that include a perceived incapacity to control their emotions, behavior, reactions, and perceived negative outcomes of losing control. These elements collectively make up negative beliefs about losing control.

1.3.3.2. Beliefs about losing control in Panic Disorder

According to Barlow (1988), the concept of losing control is thought to play a fundamental role in the development of behaviors associated with excessive fear and avoidance. The symptoms that are observed during panic attacks are consistent with the convictions that are presented regarding the loss of control. Beliefs about (a) losing control over behavior, which can result in involuntary actions such as trembling or shaking; (b) losing emotional control, which can lead to feelings of unreality or urges to cry; (c) losing cognitive control, which is characterized by chaotic thoughts; and (d) beliefs about undergoing fundamental changes, such as feeling detached from oneself or fearing insanity, are included in these symptoms. Inadequate frameworks for comprehending and reasoning about these experiences

can result in *exconsequential reasoning* (Arntz, Rauer, & van den Hout, 1995). This type of reasoning is characterized by the use of feelings as evidence of catastrophic occurrences, such as the statements "I am losing control because it feels that way" or "It feels dangerous because I am afraid." It is possible for people who are experiencing strong emotional impulses to be afraid of being unable to think or act rationally. Beliefs about physical catastrophes have the potential to influence avoidance behaviors and play a predictive role in the early stages of panic disorder.

1.3.3.3. Beliefs about losing control in eating disorders

According to Fairburn, Cooper, and Shafran (2003), themes of control in eating disorders point to underlying worries of losing control. It is suggested that control problems have a major role in the emergence and persistence of eating disorders (EDs), especially Anorexia Nervosa (AN). Bruch (1978) described AN as a fight for efficacy, competence, identity, and control. As early characterizations have shown, people who binge and purge frequently characterize these behaviors as attempts to recover control over food (e.g., Bemis, 1978). An excessive amount of behavior linked to eating disorders is focused on attempts to regulate body image and weight. Numerous Anorexia Nervosa maintenance theories highlight the role of control within the illness, proposing that people view their ability to regulate their weight and shape as measures of their own value and ability to exercise self-control (Fairburn, Cooper, & Shafran, 2003).

Chapter 2. Review of Literature

Preamble

The following section will provide a full summary of the existing assessment techniques for assessing OCD symptoms. Their advantages and disadvantages will be addressed. It is important to note that some of these instruments are not specifically designed for OCD; rather, they address symptoms that are shared with other diseases or are typically associated with OCD.

2.1. OCD symptoms assessment tools

2.1.1. *The Yale–Brown Obsessive–Compulsive Scale (Y-BOCS)*

The Yale–Brown Obsessive–Compulsive Scale (Y-BOCS) includes a Symptom Checklist and Severity Scale. The checklist comprises 54 items categorized by theme or behavior. Clinicians assess the symptoms experienced over the past week using a five-point scale for dimensions such as time/frequency, interference, distress, resistance, and degree of control. It is widely regarded as the gold standard for assessing OCD severity. The Y-BOCS Total Severity score exhibits robust psychometric properties, including good internal consistency ($\alpha = 0.87$), excellent interrater reliability (ICC = 0.98), and solid test–retest reliability ($r = 0.81–0.97$ over a two-week interval). Additionally, the Y-BOCS demonstrates favorable convergent validity, showing good to fair correlation with clinician-rated measures of OCD impairment and self-reported obsessive–compulsive symptoms (Frost et al., 1995; Antony et al., 2001).

Despite being widely used, the Y-BOCS is subject to two main criticisms. First, it shows limited discriminant validity with depression, as indicated by moderate-to-strong correlations with depression severity. This may be influenced by the high co-occurrence

of OCD and depression, with studies suggesting that 25%–50% of individuals with OCD also experience Major Depressive Disorder (MDD). Second, the Y-BOCS exhibits inconsistent factor structures across studies. While some studies support the original two-factor structure (obsessions and compulsions), others propose a "disturbance factor" and a "symptom severity factor." Additionally, some studies suggest a three-factor structure, including "severity of obsessions," "severity of compulsions," and "resistance to symptoms." (Rapp et al., 2016; Taylor, 1995; Storch et al., 2005; Nestadt et al., 2001; Hong et al., 2004)

2.1.2. Florida Obsessive Compulsive Inventory (FOCI)

Transitioning to the Florida Obsessive Compulsive Inventory (FOCI), The FOCI includes a 20-item Symptom Checklist, with 10 obsessions and compulsions, each derived from the Y-BOCS (Storch et al., 2005). Additionally, it incorporates a five-item Severity Scale that assesses symptom severity and impairment over the past month, considering factors such as time occupied, distress, control, avoidance, and interference. Both the FOCI Symptom Checklist and Severity scores exhibit strong internal consistency (Symptom Checklist KR-20 = 0.78–0.83; Severity score $\alpha = 0.86–0.89$). Convergent validity is demonstrated by robust associations; specifically, the Symptom Checklist shows a strong correlation with self-reported obsessive–compulsive symptoms ($r = 0.76$), and the Severity score correlates strongly with the Y-BOCS Total Severity score ($r = 0.61–0.78$). In terms of discriminant validity, the FOCI shows fair discrimination from anxiety ($r = 0.33–0.46$) and fair to poor discrimination from depression ($r = 0.30–0.73$). However, there is currently no available information on the FOCI's test–retest reliability or established diagnostic cutoff scores (Storch et al., 2005; Aldea et al., 2009).

2.1.3. Vancouver Obsessional Compulsive Inventory (VOCI)

The Vancouver Obsessional Compulsive Inventory (VOCI), developed by Thordarson and colleagues in 2004, serves as a succinct yet robust instrument for the evaluation of obsessive-compulsive symptoms. The VOCI functions as a self-report instrument for assessing OCD symptoms, differing from the Y-BOCS in its primary objective, which is not to gauge OCD severity but to serve as a checklist for 55 OCD symptoms. Each symptom is rated on a 5-point Likert scale, and scores are derived by summing ratings across six dimensions: Contamination, Checking, Obsessions, Hoarding, Just Right Experiences, and Indecisiveness. The original VOCI has consistently shown strong psychometric properties. The VOCI is designed to assess symptom severity across six dimensions: Contamination, Checking, Obsessions, Hoarding, Just Right, and Indecisiveness. Notably, it is the only multidimensional OCD measure that introduces two new subscales—Indecisiveness and Just Right. While Indecisiveness has been recognized as a significant aspect of OCD (e.g., Abramowitz & Foa, 1998), its utility as a measure for OCD symptoms is questionable due to the construct's low specificity, as evidenced by previous research (Thordarson et al., 2004). Thordarson et al. (2004) described the contents of the Just Right scale as involving precise actions, adherence to strict routines, repetition, memorization, concerns about perfection, and a compulsion to count (Ghassemzadeh et al., 2017)

A notable strength of the VOCI lies in its brevity, making it a practical choice for both clinical assessments and research endeavors where time constraints may be a consideration. This efficiency, however, is balanced with a potential limitation inherent in self-report measures – the susceptibility to subjective bias. Given its reliance on

individuals' self-perception and interpretation, the VOCI's outcomes should be interpreted with a keen awareness of this inherent limitation.

2.1.4. Obsessive Compulsive Inventory-Revised (OCI-R)

Finally, the Obsessive Compulsive Inventory-Revised (OCI-R), a self-report measure demonstrating strong psychometric properties, offers brevity and specificity in assessing distinct symptom dimensions. Its utility extends to capturing changes in symptomatology over time and assessing treatment outcomes.

The OCI-R's brevity is a significant asset, particularly in settings where time efficiency is crucial. However, its focus on specific dimensions may limit its ability to capture the full complexity of OCD. While valuable for specific assessments, it should be complemented with measures that provide a more comprehensive understanding of the diverse dimensions of OCD symptomatology.

2.2. Assessment tools for cognition in OCD

2.2.1. Cognitive Assessment Instrument of Obsessions and Compulsions (CAIOC-13)

The CAIOC-13 (Dittrich et al., 2011) was created as a new tool for clinicians to evaluate the primary cognitive and executive deficits believed to be the cause of the effects of obsessive-compulsive symptoms on the functioning of individuals with obsessive-compulsive disorder (OCD). The thirteen items in the new scale were selected based on their propensity to be linked with functional impairment. These items encompass a variety of symptoms that are typically not evaluated in OCD rating measures, such as reading difficulty, doubt, slowness, indecisiveness, procrastination, and flexibility. The values of Cronbach's alpha for the CAIOC-13 scale were found to provide satisfactory internal consistency. Specifically, the scale showed a Cronbach's alpha of 0.92 for

clinician-rated assessments and a Cronbach's alpha of 0.93 for self-rated assessments. Factor analysis verified that all the items on the CAIOC-13 exhibited significant loading on a single factor, indicating that all the items are related to the scale's presumed framework of functional impairment. Crucially, it was concise enough to be utilised in a therapeutic environment. This provides a preliminary method for quantifying functional cognitive impairment in individuals with OCD.

2.2.2. Obsessive Beliefs Questionnaire-46 (OBQ-46)

The Obsessive Beliefs Questionnaire-46 (OBQ-46), as outlined by the OCCWG (2005) and further discussed by Dorz et al. (2009a; 2009b), is a 46-item assessment tool designed to evaluate specific domains deemed crucial to obsessive-compulsive disorder (OCD). This instrument encompasses five distinct subscales: excessive responsibility for omission, excessive responsibility for damage, over-importance of thoughts, excessive control of thoughts, and perfectionism. The Italian version of the OBQ showed good internal consistency values (Cronbach's αs ranging from .68 to .86; Dorz et al., 2009a;2009b). In correlational analyses conducted on undergraduate samples, the associations among the desire for control, sense of control, Obsessive-Compulsive (OC) symptoms, and the dysfunctional beliefs assessed by the Obsessional Beliefs Questionnaire (OBQ; Obsessive Compulsive Cognitions Working Group, 2005) were examined. The findings indicated that a higher desire for control, coupled with a lower sense of control, was predictive of increased dysfunctional beliefs and OC symptoms (Moulding & Kyrios, 2007; Moulding, Kyrios, Doron, & Nedeljkovic, 2009). Additional research has also proposed a connection between beliefs about control and phenomena related to OC.

2.3. Critical Evaluation of Existing Scales

We notice some common issues when we look closely at the tools used to understand how people feel about losing control in obsessive-compulsive disorder (OCD). The Vancouver Obsessional Compulsive Inventory (VOCI) and the Obsessive-Compulsive Inventory-Revised (OCI-R) appear to lack the necessary detail. They cover a lot of ground on different OCD symptoms, but they may overlook specific thoughts about losing control.

Similarly, scales designed to assess overall OCD severity, such as the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) and the Florida Obsessive Compulsive Inventory (FOCI), may not delve deeply enough into specific concerns about losing control. Their broad approach to all OCD symptoms may dilute the precision required to comprehend this specific fear.

Regarding the newly invented CAIOC-13 screening tool, an important consideration lies in the potential overlap between symptoms of obsessive-compulsive disorder (OCD) and Obsessive Compulsive Personality Disorder (OCPD), as highlighted by Fineberg et al. (2007). This overlapping symptomatology poses a potential limitation, potentially complicating the differentiation of specific functional impairments related solely to OCD within the proposed assessment tool. Furthermore, A possible limitation that could implicate functional impairment in the OCD group is obsessive compulsive personality disorder, which symptoms have been found to overlap with OCD (Fineberg et al., 2007). Furthermore, the CAIOC was not created in order to replace thorough clinical test and diagnostic instruments nor can it be used as a diagnostic instrument itself. It could be regarded as a tool that would provide additional information about a patient's condition,

as the CAIOC items may not normally be enquired upon during clinical assessments. Therefore, it is intended for a quick assessment of subjective and objective cognitive and functional impairments that have been found to be present in OCD.

Other tools, such as the Anxiety Sensitivity Index - 3 (ASI-3) indirectly address concerns about losing control by focusing on anxiety. They may, however, overlook the detailed understanding required for the unique thoughts associated with OCD's fear of losing control.

In the context of OCD research, beliefs about control have primarily been assessed using scales at a broader, more generalized level. Even when specialized scales, such as the Anxiety Control Questionnaire (Rapee, Craske, Brown, & Barlow, 1996), are used, as in the work of Moulding, Kyrios, Doron, and Nedeljkovic (2009), these scales tend to measure a general inclination toward a particular aspect of life rather than beliefs tied to a specific situation (Burgdorf et al., 2015). However, more precise scales are thought to be more effective for establishing practical connections between beliefs about control and other factors, a recommendation supported by Logan et al. (1991) and Skinner (1996).

2.4. Introduction to the Beliefs About Losing Control Inventory (BALCI Scale)

2.1.1. Origins and Development of BALCI

Dysfunctional beliefs are important, especially in OCD (Radomsky & Gagné, 2020). There is limited coverage of the aspect related to the fear of losing control, which includes OCD-related behaviors and emotions, the importance attached to maintaining control, and bodily functions. The Beliefs About Losing Control Inventory (BALCI) is heavily based on Clark's (2004) cognitive control theory, which states that failure to

control unwanted sexual intrusions is interpreted as evidence that one may lose control over other domains as well (e.g., "If I can't control unwanted sexual intrusions, then I might lose control over my sexual behavior"; Clark, 2004, p. 145). The BALCI provides a comprehensive perspective on beliefs about losing control. BALCI assesses negative beliefs about losing control that are self-reported.

2.1.2. Rationale for Italian Validation

As previously stated, even if the factorial structure of a scale is confirmed, it may not be deemed appropriate for use in diagnosis or assessment in a variety of cultural contexts. On the importance of cultural influences on the manifestation of OCD symptoms in different cultures, Nicolini (2017) discovered that OCD symptoms might be more severe, and cases of OCD may be more prevalent among Catholics (Steketee et al., 1991; Assarian et al., 2006). Variations in OCD symptoms have also been linked to specific religions, according to reports. OCD symptoms differ between ultra-Orthodox Jews and Muslims, for example, due to religious perspectives on rules and rituals (Okasha et al., 1994; Vinker et al., 2014). The factor structure of the scale can be influenced by a variety of linguistic and cultural factors. It is not reasonable to assume that the factor structure of a measurement tool developed in one cultural context will remain the same when applied in another (Sharma et al., 2009). In addition, considering the existing socio-cultural and socio-religious differences between Italy and the originating country where the BALCI was developed (North America), the need for confirmation of the BALCI's application arises. To date, only one published study on validating the BALCI Turkish version has been found in the literature, which is the work of Mercan and Kabaday

(2023). Based on the results of the confirmatory factor analysis (CFA), the BALCI Turkish Version (BALCI-TV) confirmed 21 items in three factors.

2.1.3. Importance of Confirmatory Factor Analysis

Exploratory factor analysis (EFA) could be described as orderly simplification of interrelated measures. EFA, traditionally, has been used to explore the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome (Child, 1990). The 3-factor solution in the BALCI was found in the original paper using EFA. However, there is a critical inferential issue to this method; correlations are the basis of factor analysis and they describe relationships. No causal inferences can be made from correlations alone. Unlike EFA, CFA is used when there is a strong model assumption. With CFA, the existence of a previously proven structure is investigated with a new data set. In scale development studies, CFA should be used to test the validity of the structure obtained after EFA (Worthington & Whittaker, 2006). Methodologically, EFA is theoretically less demanding than CFA, which requires a priori hypotheses or explicit "theory." (Schriesheim et al., 1993; Hurley et al., 1997) As a result, an EFA can always be applied to a data set, but a CFA is not always necessary. It goes without saying, though, that theory-based research is more compelling than more exploratory work in many aspects. As a result, CFA makes sure that the researcher does more than just gather data and "grind it" through exploratory procedures—rather, they take into account the relationships between data and theory.

2.1.4. Research Gap and Study Objectives

In the review of existing literature (see Figure 1 in Appendix 1), no published studies on the BALCI scale itself in an Italian population were found. The need for a

confirmatory approach to the BALCI in an Italian setting fills a critical gap when cultural, methodological, and theoretical factors are taken into account. The goal of this study is to be the first to attempt to validate the BALCI scale in an Italian context, taking into account the aforementioned methodological, cultural, and theoretical factors.

Second, it is unclear if fear of losing control contributes to the onset and persistence of anxiety-related disorders. Anxiety-related disorders, such as panic disorder (Chambless et al., 1984) and social anxiety disorder (Spokas, Luterek, & Heimberg, 2009), as well as anxiety-provoking events of life have been linked to fears of losing control. The 2020 study's narrow focus on OCD symptoms may have limited how broadly BALCI can be applied to address a wider range of difficulties related to anxiety. More, from the mentioned studies on beliefs about losing control in SAD (refer to Chapter 1), it is unclear if participants' anxiety stemmed from a fear of their observable behavioral and physiological reactions (e.g., foolish behavior/embarrassing physiological responses) or from a perceived loss of control. In addition, in the literature to this point, most of the emphasis was put on OCD symptoms, but fears of losing control have been captured in other anxiety-related problems, such as panic (e.g., Chambless et al., 1984). Hedley and colleagues (2010) found that while there was a tendency for beliefs about losing control to directly influence avoidance behaviors, there was a significant indirect effect mediated through a fear of bodily sensations. This result was unexpected from a cognitive theory perspective but suggests that the measurement instrument used to assess avoidance may not have been sensitive enough to detect more subtle forms of avoidance. The current study has incorporated the use of robust measurement tools, ACQ, PDSS and SPS, for

this specific purpose to assess BALCI-IT's generalizability and possible transdiagnostic clinical and laboratory use in anxiety-related disorders and in anxiety-provoking situations, panic and social anxiety disorder, not necessarily related to OCD. It is of importance to keep in mind that the mentioned desire for maintaining control in anxiety-related circumstances is theoretically hypothesized to be different from a desire for control over general life events as captured by DCS.

Third, unfortunately, the original ASI measurement of AS limits research on AS lower-order factors and psychopathology (Olthuis et al., 2014). Eight items make up the physical concerns element in the original 16-item ASI, while four items make up the social and cognitive concerns factors. This may limit the reliability of these latter two factors and would not be sufficient to index the social and cognitive concerns constructs. Some ASI items may lack content validity since they do not target specific dimensions (Taylor et al., 2007). Previous ASI revisions lacked a consistent factor structure. Due to these limitations, results from earlier investigations of the ASI subscales and emotional and anxiety disorders cannot be entirely trusted in, including the association of this scale with the BALCI underlying factors scores, as used in the original paper of BALCI development. In this study, we aimed to obtain a measure of anxiety sensitivity among our participants using ASI-3 for improvements in item content, factor structure, and comprehensiveness, making it a more refined and updated measure of anxiety sensitivity compared to the original ASI.

Lastly, OCD and ED have a high degree of comorbidity (Kaye et al., 2004) and many researchers have hypothesized that the two illnesses may be maintained by overlapping mechanisms or by common risk factors (Altman and Shankman, 2009; Vartanian and

Grisham, 2012). The theory that perceived loss of control plays a major role in the development of eating disorders is supported by qualitative research (Espindola and Blay, 2009). Quantitative data on the connection between eating disorders and control problems, however, is sparse and inconsistent. The various interpretations of the concept "control" that result in a variety of terminology such as "control," "locus of control," "sense of control," "desire for control," "fear of losing control," and "ineffectiveness" present a challenge to this field of study. Despite their similarities, these terminologies produce conflicting results on EDs, which makes it more difficult to grasp how EDs and control are associated, as Froreich (2016) states that no concrete predictions could have been made so far because there is an inadequate amount of research in this area. It seems possible that OCD and ED share functionally similar clinical presentations, meaning that both disorders are attempts to regain control, albeit in different ways. Given these apparent parallels between OCD and ED, we investigated the possibility that OCD symptoms are associated with the same control constructs that are relevant to ED as an exploratory aim of this study.

Chapter 3. Methodology (Research Design & Methods)

3.1. Introduction

In this chapter, Research design and relating methods will be elaborated to ensure replicability of the findings and transparency on the procedure and instruments used to conduct this study. The research hypotheses and design along with information on the setting and the sample of study will be presented. Methods (the processes followed to analyze the data), Instruments of Measurement (the instruments employed for data collection), and Data Analysis (the statistical or qualitative methods adopted to analyze the data) will be detailed as well.

3.2. Materials

3.2.1. Beliefs About Losing Control Inventory (BALCI)

The scale is made up of 21 items and has three dimensions. Thoughts, behavior, and emotions (factor 1), beliefs about the importance of maintaining control (factor 2), and beliefs about losing control over one's body/ bodily functions (factor 3) are the subdimensions. The scale is a 5-point Likert scale (0 = very little, 4 = a lot). The first dimension is concerned with "thoughts, behavior, and emotions," emphasizing their regulation (e.g., item 9: I'm concerned about my ability to manage my emotions). The second dimension is "the importance of maintaining control" and emphasizes the act of maintaining control (e.g., item 14: It's critical for me to maintain control of my thoughts). Finally, the third factor, "beliefs about losing control over one's body/bodily functions," is linked to psychosomatic symptoms (e.g., item 6: I am afraid of losing control of my bladder and/or bowels). The overall BALCI ($\alpha = .93$) and TBE subscale ($\alpha = .94$) exhibited excellent internal consistency. The internal consistency of the ISC subscale ($\alpha = .81$) and the BBF

subscale (α = .67) were considered to be good and fair, respectively. Item loads of the scale are minimum 0.40 for the sample (Radomsky & Gagné, 2020). BALCI, in essence, introduces a distinct structure that differs from previous measurement tools.

3.2.2. Vancouver Obsessional Compulsive Inventory (VOCI; Italian version by Chiorri et al., 2011)

Thordarson et al. (2004) introduced the Vancouver Obsessive Compulsive Inventory (VOCI), a self-report tool for evaluating OCD symptoms. It encompasses six subscales: contamination, checking, obsessions, hoarding, "just right", and indecisiveness. With 55 items, each graded from 0 (not at all) to 4 (very much), the VOCI exhibited strong internal consistency (α = .97) within this sample. Previous research has affirmed its sound convergent and divergent validity (Radomsky et al., 2006; Thordarson et al., 2004). The Italian version of the VOCI has been validated on a non-clinical sample (n=455) and exhibits excellent internal consistency for the total scale (α = .94) and ranges from good to excellent for the subscales (α = from .78 to .89). In this study, internal consistency was excellent for the total scale (α= .96) and for the checking (α= .91) and obsession (α= .90) subscales, and good for the other subscales: contamination (α= .88), hoarding (α= .83), indecisiveness (α= .81), just right (α= .86).

3.2.3. The Obsessive Beliefs Questionnaire – 46 (OBQ-46; Italian version by Dorz et al., 2009; Novara et al., 2011)

The OBQ-46 evaluates the core cognitive domains involved in the development and maintenance of obsessive-compulsive disorder. The Italian version has 46 items and

five subscales: perfectionism, responsibility for injury, mind control, responsibility for omission, and the relevance of thoughts. Cronbach's alpha coefficient was used to assess internal consistency. Three out of five scales had values greater than.70 (.80 < α <.86), with the exception of the responsibility for omission scale (α =.65) and relevance of ideas scale (α =.68) in the non-clinical group. Internal consistency was excellent in the current study for the total scale (α =.96) and the perfectionism subscale (α =.91), and good for the other subscales: responsibility for harm (α =.87), thought control (α =.90), responsibility for omission (α =.85), and importance of thoughts (α =.80).

3.2.4. The Anxiety Sensitivity Index-3 (ASI-3; Italian version by Petrocchi et al., 2014)

Developed by Taylor et al. (2007), the Anxiety Sensitivity Index-3 (ASI-3) is an 18-item tool derived from the original Anxiety Sensitivity Index (Peterson and Reiss, 1992). It measures individuals' apprehensions regarding potential adverse outcomes of anxiety-related symptoms, such as the fear induced by rapid heartbeats (Jardin et al., 2018). Respondents rate their responses on a 5-point Likert scale, ranging from 0 (Very Little) to 4 (Very Much), which are then aggregated to generate a total score. The ASI-3 comprises three subscales: physical concerns, cognitive concerns, and social concerns. Previous studies have affirmed the ASI-3's robust psychometric properties as a valid measure of anxiety sensitivity, with both the overall score and each subscale demonstrating acceptable to good internal consistency (Taylor et al., 2007). In the Italian version, the questionnaire demonstrates excellent internal

consistency (α = .90) and good for the physical (α = .87), social (α = .81), and cognitive (α = .83) subscales.

3.2.5. The Anxiety Control Questionnaire (ACQ; Italian version by Sassaroli et al., 2015)

The ACQ measures perceived control over emotional reactions and perceived control over external threats. It consists of 30 items rated on a 6-point Likert scale ranging from 0 (Strongly Disagree) to 5 (Strongly Agree). The items are divided into two subscales: "events" and "reactions". In the Italian version, the ACQ demonstrates good internal consistency (α = .82). In this study, internal consistency was good with α = .86 for the total scale and α = .72 and .84 respectively for the events and reactions subscales.

3.2.6. The Dutch Eating Behaviour Quetionnaire (DEB-Q; Italian version by Dakanalis et al., 2013)

The DEBQ is a self-administered survey that examines eating behaviour. The assessment comprises 33 items that are evaluated on a 5-point Likert scale, ranging from 1 (Never) to 5 (Very often). These items are categorized into three subscales: restrained eating, emotional eating, and external eating. The current study demonstrated excellent overall internal consistency, with a Cronbach's alpha coefficient of .92. The subscales of restrained eating and emotional eating also exhibited high internal consistency, with alpha coefficients of 0.93 and 0.95,

respectively. However, the subscale of external eating showed good but slightly lower internal consistency, with an alpha coefficient of 0.71.

3.2.7. The Desirability of Control Scale (DCS)

The DCS is a self-report questionnaire comprising 20 items that assess the desire for control over general life events. Respondents rate the statements on a 7-point Likert scale ranging from "1 = never" to "7 = always". The Italian translation was conducted by four researchers within the scope of the aforementioned research. In this study, internal consistency was good ($\alpha = 0.76$). This instrument, recognized for its brevity and versatility, offers insights into an individual's desire for control. Its reliability ensures consistency in capturing this aspect, while its brevity enhances its adaptability across diverse populations.

3.2.8. Social Phobia Scale (SPS; Italian version by Sica et al., 2007)

The SPS is a survey that examines symptoms associated with social anxiety disorder. The inventory comprises 20 items, and participants rate statements using a 5-point Likert scale that ranges from "0 = not at all" to "4 = very much." The internal consistency of the current study was deemed excellent, with a coefficient alpha of 0.94.

3.2.9. Panic Disorder Severity Scale (PDSS; Shear et al., 2001)

The PDSS is a questionnaire that investigates the severity and frequency of symptoms in panic disorder over the last month. It consists of 7 items rated on a 5-

point Likert scale ranging from "0 = none" to "4 = very severe/very disabling". In this study, internal consistency was good (α = .89). It is a well-established tool for assessing panic disorder severity, its strong reliability and validity contribute to its clinical utility. The structured approach of the Panic Disorder Severity Scale facilitates the systematic evaluation of panic-related symptoms, aiding in accurate diagnosis and treatment planning for panic disorder.

3.3. Research Design

As stated before, the aim of this study is to validate the firstly-translated version of the BALCI (Beliefs About Losing Control Inventory) into Italian language while ensuring the adaptation accuracy and cross-cultural suitability to further encourage the use of it in an array of contexts such as research, clinical screening, etc. It can be challenging to adapt a scale from a different culture since a concept or phrase may make sense in one culture but not in another, or it may not make sense at all.. Translation is a procedure of creating a document based on a source text in a different language. Adaptation, however, refers to the process of identifying the disparities between the source and target culture in order to preserve equivalent meaning. The purpose of cross-cultural verification is to guarantee that the new survey operates as planned and has identical features and functionalities as the original scale (Mokkink et al., 2010).

The forward-backward (FB) and dual-panel (DP) methods are the two widely employed translation methods in health-related research. However, in an important study by Hagell, no superiority has been established between the two methods (Hagell et al., 2010). Essentially, In the forward-backward translation, independent translators generate one or more forward translations into the target language, followed by back-translation into the source language by other translator(s). Differences between forward and back translations are usually addressed at

each step. Alternative translation approaches include the Dual Panel (DP) approach, in which a panel of bilingual people local to the target language produces a consensus translation. According to Ortiz-Gutiérrez and Cruz-Avelar (2018), the translator must be a native speaker of the source language and possess adequate understanding of the target language. In addition, members of the panel should include experts familiar with the concept of interest, a methodologist, forward and backward translators, and, if possible, original questionnaire developers.

To achieve a translation that is both reliable and valid, multiple procedures were performed. Upon obtaining consent from the author, the BALCI was translated from English to Italian. This task was carried out by five distinct translators: four bilingual researchers to perform the forward translation into English, one researcher to perform the backward translation along with a professional translation service to both avoid bias and to ensure the accuracy of the translation. Finally, a bilingual faculty member to review all versions of the translations and determine whether the translated and original versions achieve semantic and conceptual equivalence. the translations were assessed for clarity in consultation with the bilingual faculty member, and subsequently were merged into a single translation, selecting for the clearest language. The prefinal version of the translated questionnaire was pilot-tested on a small sample of about 30–50 individuals (Perneger et al., 2015), representing the intended respondents (Tsang et al., 2017). Following the completion of the translated questionnaire, respondents were asked to elaborate on their interpretation of each inventory item and its corresponding response. This approach enabled the investigator to verify that the translated items retained the same meaning as the original items and to determine evidence whether it has cultural similarities or differences. With this cross-

cultural evidence normality and linearity, reliability analysis, structural validity and factor loadings are calculated.

In addition to the BALCI, eight more scales/inventories were presented to the participants in a double-blind randomized order, both to the researchers and the participants. The scales/inventories the participants were subject to answer were the BALCI, Vancouver Obsessional Compulsive Inventory (VOCI), Obsessive Beliefs Questionnaire-46 (OBQ-46), Anxiety Sensitivity Index - 3 (ASI-3), Anxiety Control Questionnaire (ACQ), The Desirability of Control Scale (DCS), Panic Disorder Severity Scale (PDSS), Social Phobia Scale (SPS), Dutch Eating Behavior Questionnaire (DEBQ). These inventories/scales were presented to measure the convergent, divergent and construct validity. The assessment of convergent validity involved analyzing the correlations between BALCI scores and scores from the OBQ-46, VOCI, and ASI-3. Strong correlations in this context indicate a high level of convergent validity, as stated by Hinkin (1998). On the other hand, to evaluate divergent validity, we analysed the correlation between the BALCI and DCS, assuming weaker correlation is translated to higher level of divergent validity. The construct validity was measured using conducting zero-order Pearson correlation between BALCI scores and scores from ACQ, DEBQ, PDSS and SPS scales.

This study consisted of 2 phases. The first phase for collecting data from a pool of participants and the second phase which was completing the same survey after 5-7 weeks after the first compilation for test-retest reliability. The survey was built on Qualtrics©, survey builder platform, and was sent to the participants who enrolled in the study. Each participant must have agreed to a module of information and consent form for participation and data processing before proceeding with the survey. a series of tailored demographic questions were presented in a fixed order to the participants, including information of gender, age, education level, nationality, any

record of past or existing psychological, psychiatric, neuromuscular, neurological, cardiovascular, and other psycho-somatic diseases. a unique identifier has been assigned to each participant to discern the responses in case of duplicate or incomplete records. The participants were also asked if they agree to participate in the second compilation of the study (2^{nd} phase) after 5-7 weeks of first compilation. From those who agreed, contact information was collected and stored securely. The inventories/scales were presented in a randomized order, with the items within each being presented in the same order as in original version. A brief explanation was provided before participants start to answer each set of scales/inventories on how they are expected to rate each question in a quantitative way in accordance with each score descriptors.

3.4. Research Question(s) and hypotheses

This study is set to adapt and validate the beliefs about losing control inventory (BALCI) in the non-clinical Italian population. Cultural adaptation, according to Paula, Haddad, Weiss, Dini, and Ferreira (2014), minimizes the cost and time spent on creation and allows the previously widely used instrument to be used for intercultural comparisons.

It is worth noting to state that primary objectives of this study are in line with the limitations of the original paper on the BALCI development by Radomsky and Gagné (2020). The key limitations that were selected to be addressed will be explained and the methods to overcome these limitations in the present study will be further detailed.

First, Radomsky and Gagné (2020) used an Exploratory Factor Analysis (EFA) to reach a factor structure for the first time to assess negative beliefs about losing control as they pertain to OCD. EFA, on the other hand, is unique among scale development techniques. It is employed in situations in which it is unknown how many factors exist between the scale's items or which

factors are influenced by which particular item. EFA, as its name implies, aids in the explanation of the existing structure (Hayton, Allen, & Scarpello, 2004). CFA is used when there is a strong model assumption.. CFA uses a new data set to investigate the existence of a previously established structure. CFA should be employed in scale development studies to test the validity of the structure obtained by EFA. Adaptation studies make use of EFA and CFA in a variety of different ways. For the purpose of scale adaptation research, for instance, one of the most crucial steps is the process of translating the items from the original language to a new language. When it comes to adaptation research, it is seen that some studies make use of both EFA and CFA, while other studies solely make use of CFA. The use of CFA on its own in adaption studies could result in several complications. Using the CFA alone, for instance, could lead to a different scenario than what would actually take place, and the model could be misleading. This would be the case in the event that a translation error happened during an adaptation study. Because a data set might be compatible with more than one CFA model, it would be more advisable to carry out an exploratory factor analysis (EFA) first in order to introduce the possibility of cultural differences in the adaption. In this scenario, if an exploratory factor analysis (EFA) is not carried out, a researcher will not test a second model because the initial model that was tested was able to fit the data. Since this is the case, it is essential to first do an EFA in order to identify the potential problem (Orcan, Fatih, 2018).

The study recommends conducting a confirmatory factor analysis to replicate the three-factor structure identified in the current research. Therefore, it can be concluded that the primary hypothesis of this study is The BALCI scale will successfully replicate the three-factor structure, demonstrating robustness in the Italian non-clinical population.

The second proposition of this study is to establish that the BALCI scale, Italian version, will exhibit significant associations with anxiety-related disorders beyond OCD symptoms, providing evidence of its applicability across a broader spectrum of anxiety-related problems.

As a methodological advantage over the original 2020 study, the use of ASI-3 instead of ASI can be pointed out to. In the original paper, the ASI (Reiss et al., 1986) was used to assess the convergent validity of the BALCI, instead of the ASI-3 (Taylor et al., 2006). The ASI-3 has been shown to have improved psychometric properties over its original version, may causing the results to be interpreted with caution when it comes to the BALCI to potentially differentiate general apprehension about many things, and specific apprehension about the symptoms of anxiety itself. As the third objective, it is hypothesized that the modifications and considerations made in this study will result in comparable or improved convergent validity between the BALCI scale and ASI, acknowledging and addressing potential limitations associated with the choice of ASI over ASI-3.

Lastly, as an exploratory objective, we also extended our analysis on any possible dependencies between a construct of control, eating behavior, and underlying fear of losing control within this area and its related disorders to assess if it is applicable to provide evidence for relevance and generalizability for dysfunctional eating behavior and disorders.

3.5. Procedure, Setting and Sample

Permission was secured from Adam Radomsky for the adaptation of the BALCI. The researchers distributed the survey to participants via email. Initially, details about the research were provided, along with a secure page for confidential identity information. They were then requested to confirm their voluntary participation in this research. The study was carried out

using a reliable survey management platform, Qualtrics©, recruiting participants who were geographically diverse across various regions of Italy. The participant selection process was initiated through the utilization of random sampling from the larger target population. This involved randomly choosing of individuals from databases, lists, or other relevant sources, with the goal of obtaining a representative sample of the Italian population. During the initial stage of selecting participants, the random draw mainly included scholars, which represents the diverse professional and educational backgrounds that exist within the Italian population. The deliberate inclusion of participants with diverse attributes from the beginning helped create a varied sample. According to MacCallum and colleagues (1999), samples ranging from 100 to 200 are considered acceptable when the factors are well-determined. Based on the estimated sample size for EFA, it is recommended that the sample size should range from 100 to 250. At the beginning, a total of 463 participants aged between 18 and 65 years were recruited from the general population for the study. However, 50 individuals were excluded because they did not meet the specified criteria, such as being over 65 years old, having diagnosed psychopathologies, severe neurological damage, neuromuscular issues, gastrointestinal disorders, urinary or bowel dysfunctions, pregnancy, or cardiovascular problems. This left a final sample size of 413 participants, ranging in age from 18 to 65 years, with an average age of 27.47 years and a standard deviation of 0.44. Analysis of the age distribution revealed a notable decline in participant numbers beyond the age of 32, resulting in a skewed distribution with a positive skewness value of 1.9 and a kurtosis of 3.82. Gender distribution within the total sample was heavily skewed, with 86.92% identifying as female, 11.14% as male, and 1.94% selecting "Other/prefer not to specify." Since only eight participants fell into the "Other/prefer not to specify" category, a t-test was conducted to compare mean scores between females and males,

excluding this group. Results indicated that females had significantly higher BALCI scores than males ($t(57.65) = 3.22$, $p < .01$). However, this gender effect disappeared when considering only participants under 32 years of age. Therefore, a cutoff age of 32 was implemented, leading to the exclusion of 77 participants. Additionally, the eight individuals who had selected "Other/prefer not to specify" for gender were also removed from further analysis. Upon closer examination, it was discovered that 270 participants had failed to answer all the questions in the survey. This was primarily caused by a combination of mistakes made by individuals and a technical problem with the Qualtrics platform, specifically in relation to question 9 of the BALCI. To resolve this problem during the final analysis of the sample, mean substitution was utilized. While examining this sample, we detected multivariate outliers by employing Mahalanobis distance. Consequently, we eliminated a single case with a p-value lower than .001 (Tabachnick, Fidell, & Ullman, 2013). There were no instances of univariate outliers found for BALCI scores, indicating that no person had a Z score exceeding 3.29 (Tabachnick et al., 2013).

3.6. Data Collection and Analysis

The process of data management employed particular softwares at each step for a specific purpose. For the purpose of initial data cleaning and preparing for the next steps, Microsoft Excel 2019 was used. Further, IBM SPSS Statistics 26 was used to conduct a demographical analysis as well as Reliability Statistics, including scale- and item-wise, convergent and divergent reliability, test-retest correlations, structural validity (factor loadings).

It is imperative here to make a note on how reliability was defined in this study. According to Peters (2014), Cronbach alpha assesses scale score reliability (the reliability of aggregated scale scores), in contrast to the common assumption that it measures internal consistency, interpreted as an indicator of the degree to which the items comprising the scale measure the same

underlying variable (interestingly, this is the assumption of 'unidimensionality' in the generic, parallel, and essentially tau-equivalent models of reliability). Cronbach alpha presents multiple limitations: Typically relying on inadequate missing data strategies, assuming the tau equivalence of the items (equal loadings and intercepts), which is seldom a realistic assumption (Dunn et al., 2013). As such, it provides a lower bound on reliability. Other psychological traits, such as attitude, beliefs, and coping abilities, can be argued to be unidimensional more easily. Even for these structures, the many elements employed to measure them are not always intended to be exact replicas of one another.

For example, negative beliefs about strong emotions and thoughts and intense behaviors reflect perceived control over multiple psychological functions simultaneously. Prioritizing to remain calm and collected reflect perceived importance of staying in control. Additionally, beliefs on the function of our body when we get anxious or triggered by the intrusive thoughts reflect perceived losing control over one's Body and Bodily Functions.

Consider the following three items to measure beliefs about losing control over one's thoughts/behavior/emotions: "Strong emotions can be dangerous because you might lose control [Not at all – very much]", "If I don't manage the thoughts, images or impulses in my mind, I will lose control [Not at all – very much]", "I'm afraid I might do something inappropriate or embarrassing [Not at all – very much]". Also, consider the following three items to measure perceived importance of staying in control: "It's important for me to stay in control of my thoughts [Not at all – very much]", "Staying in control is an important priority for me [Not at all – very much]", and "It's important for me to keep my emotions from spiraling out of control [Not at all – very much]".

Most readers will probably sense the following: these three *thoughts/behavior/emotions* items do not measure the same dimension, and neither do the *perceived importance of staying in control* items. Instead of being meant as repeated measurements of the same underlying unidimensional construct, these items are combined in one measure because aggregating the subjective fear experienced with regards to these different areas provides a useful indicator of the total subjective fear experienced.

If a great amount of fear is experienced when feeling strong emotions, but not when sensing intense thoughts or impulses, the fear related to losing control over TBE (Thoughts, Behavior, and Emotions) is considerably lower than when fear is experienced when feeling a surge of emotions, thoughts or impulses. Similarly, there is no reason to assume that there is a correlation between the prioritizing one's control over a situation and to keep control of one's thoughts. However, both measures likely contribute to a person's perceived fear of losing control and the intensity to which this fear will most likely affect their behavior.

Aggregating these measures despite the clear lack of unidimensionality is warranted based on theory. For example, Clark's (2004) cognitive control theory posit that failed thought control is taken as evidence that one could lose control over other domains as well. If a researcher then wants to study the relative contribution of fear of losing control of domains of emotion, thoughts and behavior to the prediction of behavior of a person with OCD, aggregating these TBE beliefs, which all exert their influence on behavior in a similar manner, makes sense.

In order to tackle the mentioned issues, we employed multiple measurements such as factor analysis, factor loadings, measuring all eigen values, McDonald's Omega, Cronbach's Alpha and correlation matrix. Aside from increased reliability, another reason for using multiple measurements to measure a construct is increased validity. Omega is an easy-to use macro for

SPSS and SAS that calculates McDonald's omega without relying on the estimation of factor loadings or error variances using CFA (Hayes, 2020). Omega was estimated using this macro on SPSS 26 without a prior CFA.

Maximum likelihood (ML) in confirmatory factor analysis (CFA) operates under the assumption that the observed indicators adhere to a multivariate and continuous normal distribution. However, this assumption is not suitable for ordinal (categorical) observed variables. Incorporated into CFA models when this normality assumption is marginally or moderately violated is robust ML (MLR). When it comes to modeling ordered or categorical data, the best option is diagonally weighted least squares (WLSMV), a robust estimator that doesn't assume normally distributed variables. (Proitsi et al., 2009; Brown, 2006).

To assume the same number of factors extracted from the original BALCI and to apply this assumption to proceed with a CFA, a factor extraction was conducted using Mplus via WLSMV approach and SPSS via Maximum likelihood (ML); ML seeks to maximize the validity or rather the generalizability, of the factors. This method is arguably more severe than the other ones, and more sensitive to violations of the model's assumptions. However, due to the nature of the response items being ordinal, it is more appropriate to employ WLSMV approach to our data being of ordinal nature. In order to measure sampling adequacy for each variable in the model and for the complete model, we used Kaiser-Meyer-Olkin Measure of Sampling Adecuacy. KMO values convey vital information about the quality of the dataset. A range between 0.8 and 1 signals satisfactory sampling, while values below 0.6 or between 0.5 and 0.6 warrant remedial action. Additionally, KMO values falling within 0.00 to 0.49, 0.50 to 0.59, and 0.60 to 0.69 reflect unacceptable, miserable, and mediocre levels, respectively. Values from 0.70 to 0.79 indicate a middling adequacy, 0.80 to 0.89 are meritorious, and 0.90 to 1.00 are considered

marvelous (Dodge, 2008). The Bartlett's test of Sphericity is not appropriate to interpret in our sample, since it is only applicable in small samples. Another measure to consider while approving the number of factors retained are communalities, eigenvalues, and scree test. eigenvalue refers to the amount of variance explained by a factor. factors with eigenvalues greater than 1.0 should be retained (Zwick and Velicer 1986). A Scree plot is a line graph of a factor's eigenvalues (Cattell 1966). The graphic shows the number of components on the x-axis and the eigenvalues on the y-axis. To determine the number of factors to retain, look out for the point where the eigenvalue declines steeply and then levels off. The scree plot also confirms the number of factors we need to retain.

For the purpose of a preliminary Explanatory Factor Analysis and Confirmatory Factor Analysis, we used Mplus (Muthen & Muthen) version 7. We approached the dataset by recoding the variables of interest into more defined variables in terms of variable names. Then, possible missing values were recoded into -999. The variables are age, sex, and 21 items of the BALCI Italian version. A descriptive analysis was conducted for counting valid and missing data. No missing values was observed for none of the variables of interest for CFA purposes. After assessing the descriptives in SPSS, we used these data in Mplus. The estimator we used is WLSMV.

missing values are handled with pairwise present approach. The BALCI scale was assumed to be a three-factor measure. No two items had parallel wordings and therefore, it is not an issue in our analysis. For estimating the parameters of the latent variable in our model, we began with unstandardized factor approach (ULI), setting the first item from each factor as referent by fixing its loading to 1 while releasing the variance to vary freely. While ULI assumes that all items have equal discrimination, UVI assumes that each item has a unique discrimination parameter. In our

scale, since there are almost no major methodological artifacts involved, it may be more appropriate to use ULI.

no cases were excluded from the CFA analysis in Mplus for missing on variables, rendering 325 observations. We used DELTA parameterization and the estimator used 1000 iterations as the maximum number, 2000 iterations for H1 and convergence criterion of 0.00005.

In our study, we utilized various statistical measures to evaluate the model fit, including the chi-square test of exact fit (χ^2), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA) along with its confidence intervals (Hu & Bentler, 1999; Marsh et al., 2005). Nevertheless, we took into consideration the well-documented dependency of the sample size and the sensitivity of the chi-square test of exact fit to minor misspecifications, and thus relied on the goodness-of-fit indices that are independent of the sample size (i.e., CFI, TLI, RMSEA) for assessing the model fit, as suggested by Hu and Bentler (1999) and Marsh, Hau, and Grayson (2005).

Chapter 4. Findings

4.1. Descriptive statistics

The final sample comprised 325 participants (see Table 1), with 302 females (93%) and 23 males (7%), and an average age of 23.85 years (SD = 3.23; range = 18-32). The largest chunk of participants was in the age range of 23 to 25 years old with a cumulative percentage of 37.8% of participants (See Figure 1). The skewness value of 0.49, with a standard deviation of 1.82, was within acceptable range. However, the kurtosis value of -0.17, with a standard deviation of -0.32, was relatively high (George & Mallery, 2010).

4.2. Demographic information

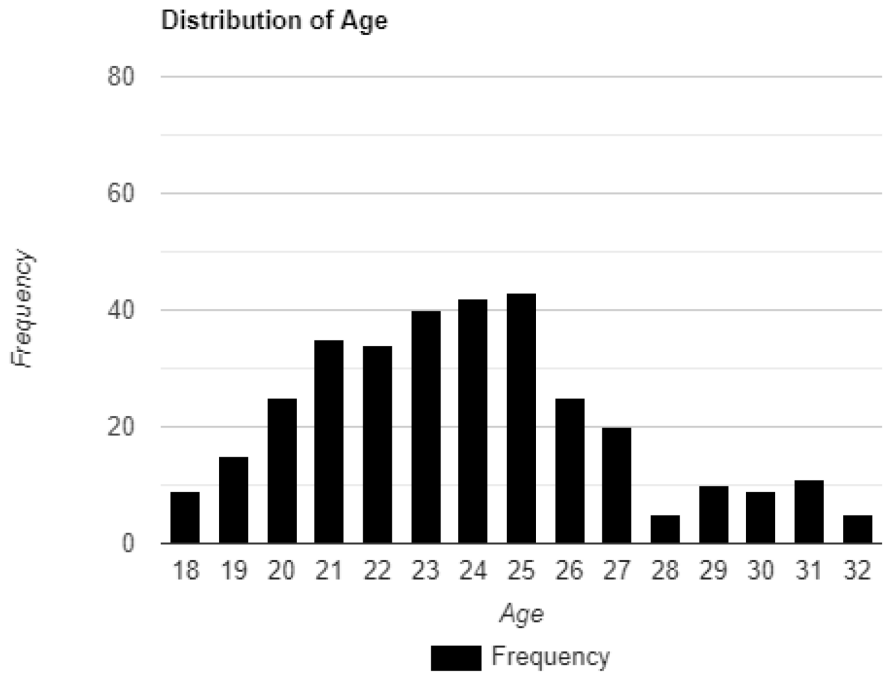


Figure 1 Distribution of age with 302 females (93%) and 23 males (7%), and an average age of 23.85 years (SD = 3.23; range = 18-32).

Table 1

Distribution of gender

Gender	Female	Male
Numbers	302	23
Percentage	92.98%	7.01%

The participants consisted primarily of students (64.53%), with full-time employees comprising the second largest group (15.60%). Unemployed individuals accounted for 7.03% of the participants, while those with part-time employment comprised 5.50%. No participant reported to be retired or not able to work due to disability (See Figure 2).

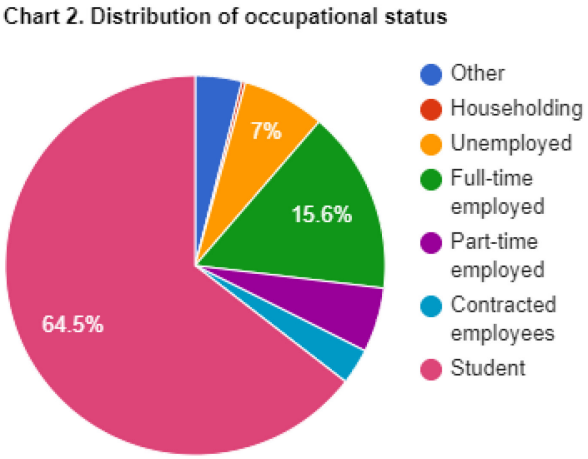


Figure 2 Distribution of occupational status

Regarding marital status, a substantial proportion (92.97%) indicated that they were either single or engaged but not living together, whereas 6.73% stated that they were married or living

together. 0.30% of the participants reported being separated or divorced. No participant reported to be widowed (See Table 2).

Table 2

Distribution of civic status

Status	Separated/divorced	Single/Engaged separately living	Married/Engaged cohabiting
Frequency	1	304	22
Percentage	0.30%	92.97%	6.73%

The predominant educational levels in the sample are 16 years (28.7%) and 18 years (29.3%) of schooling (See Figure 3). These likely represent persons who have successfully obtained a bachelor's and master's degree, respectively. Approximately 10.1% of the individuals polled have achieved 13 to 15 years of schooling, indicating a considerable percentage have obtained education beyond high school, potentially including the completion of a bachelor's degree. In addition to bachelor's and master's degrees, a significant proportion (6.73%) of persons have undertaken additional education, which may include PhD programs. The percentages decline for education levels above the conventional bachelor's and master's degrees, such as 17 years (5%) and 22 years (1.84%) of education, suggesting a lower number of individuals who have chosen to pursue specialized or prolonged educational trajectories. The education levels of 10, 11, and 25 years have the lowest percentages, ranging from 0.30% to 0.60%. This indicates that these levels are less prevalent and may represent highly specialized or unconventional educational paths.

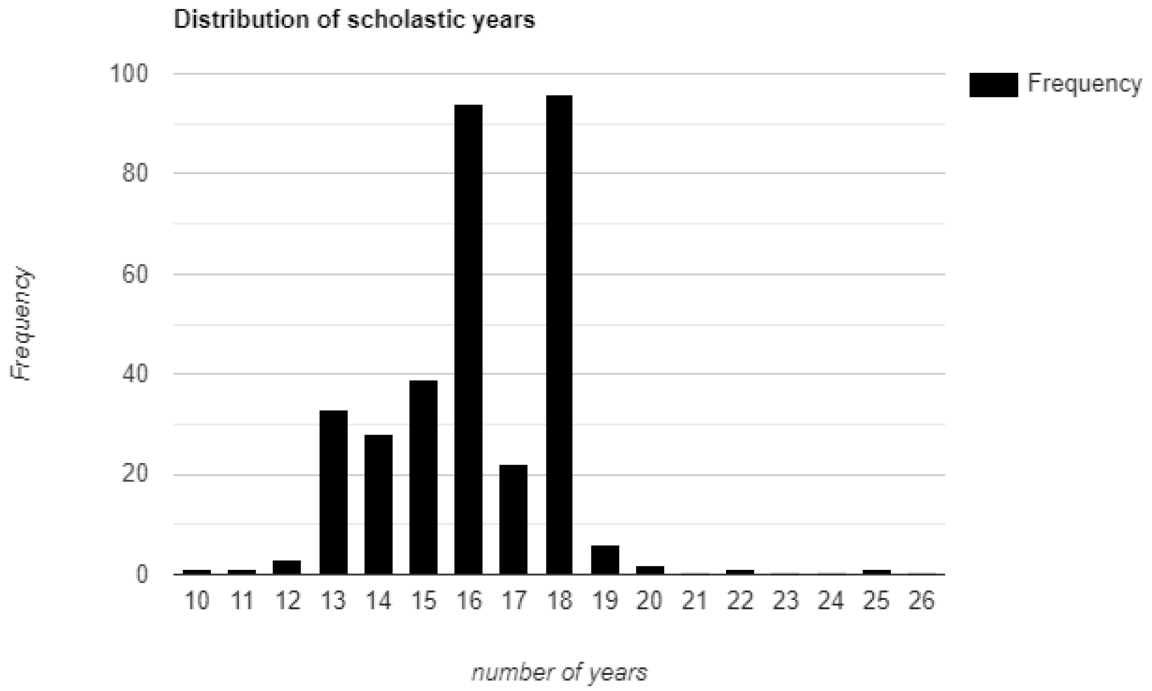


Figure 3 Distribution of scholastic years; Bachelor's (28.7%) and master's (29.3%) degrees are most prevalent, with 10.1% having education beyond high school, 6.73% pursuing higher education, and rare specialized levels (5% for 17 years, 1.84% for 22 years, 0.30

In the area of psychological conditions (See Figure 4), slightly more than half of the participants (57.19%) answered negatively or disagreed with having a psychological condition, while only 42.81% agreed or acknowledged them. When asked about medicine, a large majority of respondents (88.99%) said they preferred non-drug approaches, meaning they do not use medication for their mental health problems or do not take medication at all. Only 11.01 percent of those surveyed said they had used medicine to help with their mental health.

Upon analysis of the reported mental health conditions, anxiety disorders emerge as the most prevalent category, consisting of 22 entries. A variety of psychological disorders, including generalized anxiety and panic attacks, are reported by individuals. Subsequently, the category of Depression Disorders comprises eleven entries, representing a wide range of depression

manifestations and related conditions. With three entries, trauma-related disorders account for the third highest prevalence, reflecting experiences associated with post-traumatic stress disorder and trauma. Family-related disorders, which pertain to matters concerning the family, are illustrated by five entries. Seven entries comprise Existential and Emotional Disorders, which encompass a wide variety of psychological distress. The 11 entries comprising Behavioral and Emotional Regulation Disorders illustrate difficulties with stress management and mood regulation. The category of Miscellaneous or Unclear Disorders comprises 3 entries, same as eating disorders that is represented by 3 entries. Regarding any existing or previous record of medical condition, Gynecological problems were reported by 7 participants, followed by

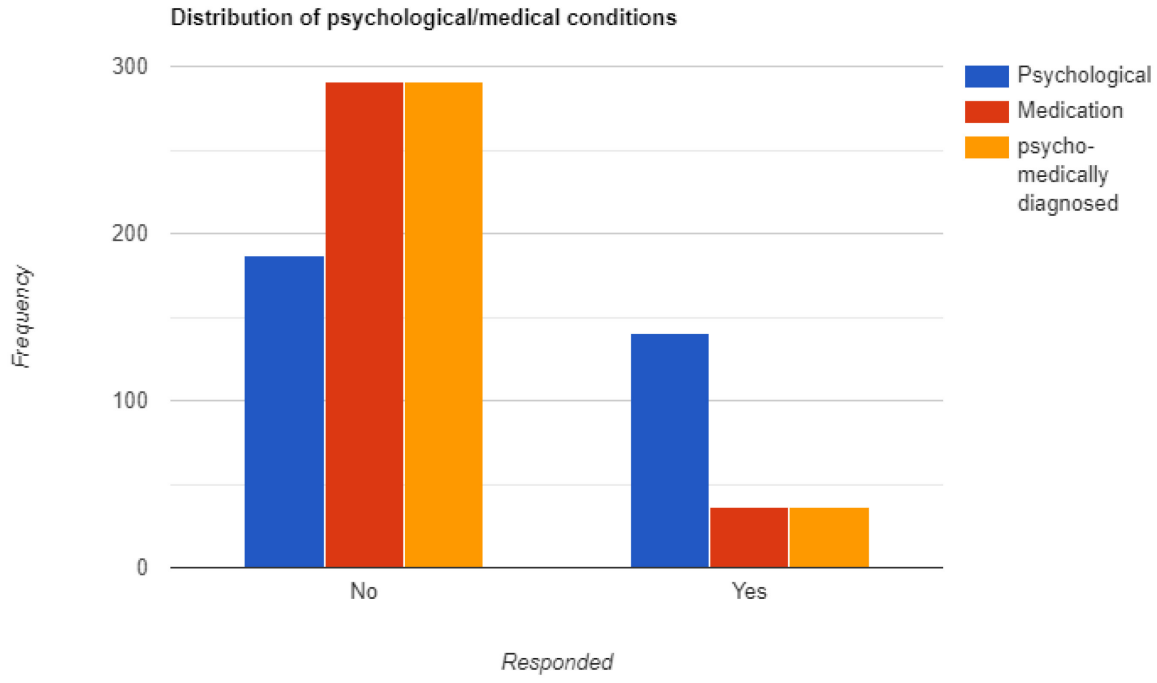


Figure 4 Distribution of psychological/medical conditions; Anxiety and depression are the prominent mental health concerns in the reported entries, followed by trauma-related issues, family-related challenges, and various emotional and behavioral disorders. The medical conditions were Gynecological problems, Asthma, Migraines, and Gastroesophageal reflux, and Thyroid issues.

Asthma, Migraines, and Gastroesophageal reflux each mentioned 3 times in the database and lastly, Thyroid issues, stated by 4 participants.

4.3. Scale reliability

As guided in chapter 3 on methodology, a variety of measures were taken into account to make sure that internal consistency is not solely relied on Cronbach's alpha. To begin with Cronbach's alpha, Both the TBE subscale (α =.95) and the overall BALCI (α =.95) showed excellent internal consistency. While the BBF subscale (α =.58) shown fair consistency, the ISC subscale (α =.88) demonstrated strong internal consistency (See table 3). Omega has proven to be more robust than alpha against deviations from the assumptions noted above, and will thus generally be a more suitable measure of internal consistency. The difference between alpha and omega will often be small, but can also be substantial, depending on the extent of the deviations from the assumptions (Yang, 2011). Omega will have a value between 0 and 1. Internal consistency is usually considered acceptable if the estimate is 0.70 or higher (McNeish D, 2018). The McDonald's Omega for BALCI-IT was estimated to be .955 showing excellent reliability, in line with the results from Cronbach's alpha scale reliability. The skewness and kurtosis of the data for each scale is indicated in table 13. The BALCI-IT scale has a slightly positive (skewness = 0.60) and slightly negative (kurtosis = -0.17) distribution, both within acceptable limits (Mishra P et al., 2019).

Table 3

Scale Reliability Statistics

Score	Unstandardized reliability (ω)	Standardized reliability (ω)	Cronbach's alpha	Number of items	skewness	kurtosis
Total score	.955	.950	.950	21	0.60	-0.17
TBE	.991	.961	.952	14		
BBF	.749	.906	.887	4		
ISC	.840	.738	.589	3		

Note. McDonald's Omega analysis using a macro called Omega calculator developed by Dr. Andrew F. Hayes, which can be found at https://afhayes.com/spss-sas-and-r-macros-and-code.html. This calculation of omega is derived from the factor loadings of a forced single-factor maximum likelihood factor analysis conducted using SPSS's built-in FACTOR procedure.

The mean value for all variables is roughly 1.347. The mean standard deviation is approximately 1.159, indicating a considerable level of variability in the scores. The range of average values (0.280 to 2.280) and standard deviations (0.675 to 1.325) highlights the diversity in individuals' responses. More importantly, an “if item dropped” item reliability analysis shows dropping which item(s) would increase the Cronbach’s alpha and Omega from the current value (See table 4). Retaining an item that would lower the reliability of the scale means the scale would have more random error than if the item were omitted. There is no statistical test for dropping items from Cronbach's alpha. Instead, the goal is to maximize the reliability of the scale. Therefore, the standard practice is to drop any item that is lowering the reliability. Upon a closer examination of the item reliability, removing item 6 and 7 from the BALCI Italian version can potentially increase both the overall Cronbach’s alpha and McDonalds Omega. Doing so also depends on seeing if the item(s) lowering the alpha correspond to items with notably lower factor loadings in the Explanatory Factor Analysis. It is evident in the average factor loadings that items 6 and 7 carry relatively lower factor loadings (0.441 and 0.484 respectively, See table 12).

Table 4
Item Reliability Statistics

			If item dropped	
Items	Mean	SD	McDonald's ω	Cronbach's α
BA1	1.812	1.212	0.951	0.947
BA2	1.658	1.283	0.951	0.947
BA3	1.542	1.265	0.951	0.946
BA4	1.545	1.325	0.951	0.946
BA5	1.194	1.172	0.951	0.947
BA6	0.502	0.901	0.956	0.953
BA7	0.280	0.675	0.955	0.952
BA8	1.471	1.309	0.950	0.946
BA9	1.853	0.716	0.954	0.951
BA10	1.914	1.312	0.954	0.949
BA11	1.372	1.141	0.952	0.947
BA12	1.222	1.212	0.951	0.947
BA13	1.163	1.207	0.952	0.947
BA14	2.277	1.164	0.953	0.949
BA15	2.280	1.194	0.954	0.949
BA16	1.618	1.280	0.950	0.945
BA17	1.215	1.216	0.950	0.946
BA18	0.985	1.110	0.953	0.948
BA19	1.963	1.181	0.952	0.947
BA20	0.806	1.158	0.955	0.951
BA21	1.191	1.225	0.954	0.949

Note. Of the observations, 325 were used, 0 were excluded listwise, and 325 were provided.

4.4. Test–retest reliability

A total of 47 participants were contacted for the running the re-test. This is the number of the participants who agreed to participate in the second phase of the study, providing their contact information. 24 participants responded to the BALCI-IT at three-week interval. In the test study, the mean BALCI-IT score was 38.08 (SD = 18.05, range = 79); in the re-test study, it was 46.74 (SD = 16.75, range = 56). The statistical analysis for test-retest reliability was conducted using Pearson correlation. A moderate correlation ($r = .561$, $p < 0.01$) was observed between the two variables under consideration (Murphy & Davidshofer, 1988).

Table 5

Test–retest reliability

				test	retest
Test	Pearson Correlation			1	.561**
	Sig. (2-tailed)				.004
	N			24	24
	Bootstrap[c]	Bias		0	-.014
		Std. Error		0	.121
		95% Confidence Interval	Lower	1	.264
			Upper	1	.745
Retest	Pearson Correlation			.561**	1
	Sig. (2-tailed)			.004	
	N			24	24
	Bootstrap[c]	Bias		-.014	0
		Std. Error		.121	0
		95% Confidence Interval	Lower	.264	1
			Upper	.745	1

**. Correlation is significant at the 0.01 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

4.5. Exploratory Factor Analysis

In order to make sure of the correctness of the assumption of the number of factors estimated via an EFA prior to CFA, certain steps were taken to make confirm a 3-factor solution for our dataset. These measures were considering KMO, Bartlett, communalities, eigenvalues (estimated via Mplus and not via SPSS), scree test, and explanatory factor analysis on Mplus. The dataset has a Kaiser-Meyer-Olkin (KMO) of 0.960, suggesting excellent sampling adequacy. This high KMO score indicates that the dataset is particularly well-suited to factor analysis. The significant correlations between variables contribute to the data's reliability, making it ideal for extracting relevant aspects.

Table 6

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.960
Bartlett's Test of Sphericity	Approx. Chi-Square	4719.402
	df	210
	Sig.	.000

The communalities analysis of the BALCI-IT scale, which is segmented into three factors (TBE, ISC, and BBF), demonstrates the extent of shared variance within each component during both the initial and extraction phases of factor analysis. During the extraction stage, it was observed that several items related to the TBE factor (Thoughts, Behavior, and Emotions) showed high communalities, ranging from 0.604 to 0.792. This indicates that a substantial amount of the variability in these items can be attributed to the underlying variables. Items BA6 and BA7 exhibited lower communalities, indicating a weaker association with the TBE factor.

items BA15, BA16, and BA20 exhibited moderate communalities (ranging from 0.609 to 0.768), indicating that a satisfactory amount of variance in this dimension was accounted for by the extracted factors.items BA7, BA8, BA21, and BA22 , encompassed by the BBF factor, showed different levels of communalities, ranging from 0.432 to 0.780. Significantly, BA10 exhibited a relatively lower level of communality, suggesting a less prominent association with the elements recovered in the BBF factor. Nevertheless, the communalities obtained using the maximum likelihood method in SPSS should be regarded with caution, as the WLSMV method in Mplus was shown to be the most suitable approach for our data.

Table 7

Communalities

	Initial	Extraction
BA1	.659	.664
BA2	.704	.709
BA3	.711	.710
BA4	.717	.792
BA5	.609	.604
BA6	.219	.065
BA7	.153	.078
BA8	.746	.768
BA9	.268	.230
BA10	.472	.401
BA11	.602	.616
BA12	.687	.705
BA13	.644	.708
BA14	.688	.780
BA15	.645	.742
BA16	.763	.768
BA17	.719	.714
BA18	.494	.432
BA19	.677	.709
BA20	.299	.240
BA21	.449	.365

Extraction Method: Maximum Likelihood.

Eigenvalues were computed using a Maximum Likelihood approach in SPSS. The number of eigenvalues greater than 1 was computed to be 3, meaning there can be 3 corresponding factors based on Kaiser's (1960) greater-than-one criterion, cumulatively explaining 63.63% of total variance. Nevertheless, this computation obtained using the maximum likelihood method in SPSS should be regarded with caution as the eigenvalues estimated from SPSS is best suitable for continuous data using a Maximum Likelihood approach.

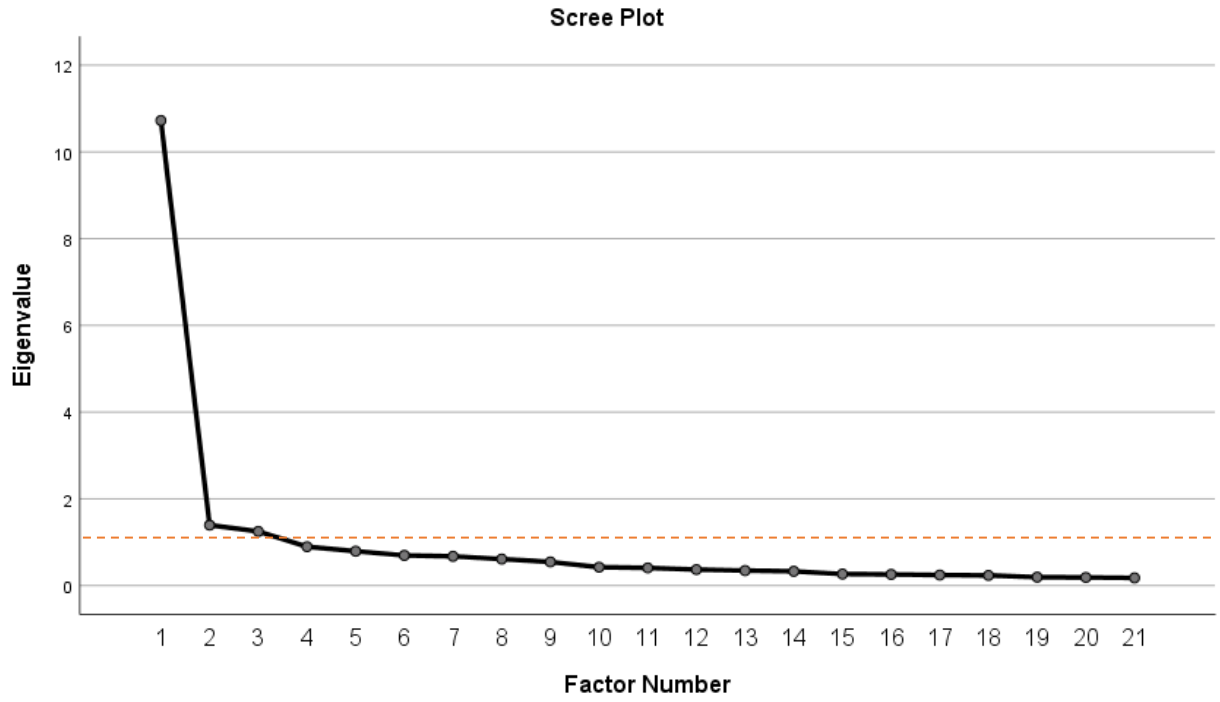
Table 8

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.723	51.062	51.062	10.329	49.184	49.184
2	1.393	6.635	57.696	1.095	5.215	54.399
3	1.248	5.941	63.637	.376	1.791	56.190
4	.896	4.267	67.904			
5	.792	3.772	71.676			
6	.694	3.306	74.982			
7	.673	3.206	78.189			
8	.611	2.909	81.098			
9	.544	2.591	83.689			
10	.424	2.018	85.707			
11	.406	1.935	87.641			
12	.368	1.752	89.393			
13	.346	1.645	91.039			
14	.328	1.563	92.601			
15	.265	1.260	93.861			
16	.257	1.223	95.085			
17	.243	1.155	96.240			
18	.233	1.111	97.351			
19	.194	.922	98.273			
20	.186	.887	99.160			
21	.176	.840	100.000			

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.



Using the scree plot, we look for the point at which the line graph begins to 'flatten', and that will tell the number of factors present. After a visual inspection, we can tell that just before number 4 on the horizontal axis, the line begins to flatten, supported by the eigenvalues calculated priorly. The findings so far were computed using the maximum likelihood approach within SPSS. These results are accompanied by an explanatory factor analysis via Mplus, that employs weighted least square mean and variance adjusted (WLSMV) to handle the data that is of ordinal (categorical) nature in our case. The fit indices derived from exploratory factor analysis (EFA) offer significant insights regarding the suitability of one-factor, two-factor, and three-factor models for confirming the number of factors for a CFA analysis for the observed data.

Beginning with the one-factor model, it is apparent that this model is not adequately fitted, as supported by the substantial chi-square value of 854.678 ($p < 0.0001$). The Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) indicate a moderate level of fit, with respective values of

0.945 and 0.939. The confidence interval (CI: 0.097;0.111) and Root Mean Square Error of Approximation (RMSEA) of 0.104 provide additional evidence that the one-factor model fails to sufficiently represent the fundamental structure of the data.

Transitioning to the two-factor model, a discernible enhancement in fit is observed. Significantly decreasing to 303.750 ($p < 0.0001$), the chi-square value, while CFI and TLI increase considerably to 0.989 and 0.986, respectively. As compared to the one-factor model, the RMSEA falls to 0.050 with a narrower confidence interval (CI: 0.040;0.058), indicating a significantly improved fit. This indicates that the observed patterns in the data are more adequately accounted for by introducing an additional factor.

The model consisting of three factors provides the most accurate approximation when compared to the other two models. Despite the statistical significance of the chi-square value (224.098, $p = 0.0001$), both the CFI and TLI attain substantial values of 0.994 and 0.991, respectively. A further reduction in the RMSEA to 0.039, accompanied by a narrow confidence interval (CI: 0.028; 0.049), signifies a strong and reliable fit. It appears that the three-factor model more precisely represents the underlying structure of the data in comparison to both the one-factor and two-factor models.

Table 9

Fit Indices for one-, two- and three Factor Models

	$\chi 2$	df	CFI	TLI	RMSEA	CI
1 Factor	854.678*	189	0.945	0.939	0.104	0.097;0.111
2 Factor	303.750*	169	0.989	0.986	0.050	0.040;0.058
3 Factor	224.098*	150	0.994	0.991	0.039	0.028;0.049

Note. P-Value is at 0.0000 for one- and two-factor models and at 0.0001 for three factor model.

The BALCI-IT components' correlation matrix shows interesting patterns in their interactions. Notably, BALCI (total) and BALCI TBE have an almost perfect positive linear correlation (correlation coefficient = 0.98). Furthermore, BALCI ISC and BALCI (total) exhibit a moderately high positive correlation of 0.76, demonstrating a strong positive association with ISC. Between BALCI (total) and BALCI BBF, there is a positive correlation of 0.70, indicating a relationship with BBF. Additionally, there are positive correlations between BALCI TBE and BALCI ISC (0.67) and BALCI BBF (0.61), as shown by the moderate correlations between the two components. Last but not least, a modest positive correlation of 0.45 between BALCI ISC and BALCI BBF shows that there is a relationship between ISC and BBF, though not as high as with previous pairs.

Table 10
Correlation matrix of BALCI-IT

	BALCI (total)	BALCI TBE	BALCI ISC	BALCI BBF
BALCI (total)		0.98	0.76	0.70
BALCI TBE	0.98		0.67	0.61
BALCI ISC	0.76	0.67		0.45
BALCI BBF	0.70	0.61	0.45	

4.6. Confirmatory Factor Analysis

It was suggested by the findings of the EFA that three factors explained more than 63 percent of the variance. Bartlett's Test of Sphericity yielded a p-value of less than 0.001, suggesting that the sample was adequate. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy found a value of .960, indicating that the sample was adequate. After constructing a Scree plot of the eigenvalues,

it was demonstrated that the three-factor structure is significantly more favorable than the other two. Accompanied by an EFA exploration via Mplus, a three-factor structure of BALCI-IT was supported. (χ^2 = 224.098, p = 0.0001, CFI = 0.994, TLI = 0.991, RMSEA = 0.039, CI: 0.028; 0.049)

Based on the recommendation of the EFA, which proposed a three-factor solution, the model was initially constructed with only one latent factor. The estimation model employed was weighted least square mean and variance adjusted (WLSMV), and standardized coefficients were utilized. This choice was made for the acceptable skewness and kurtosis observed in the items, as indicated in Table 13.

To evaluate the theoretical basis of the BALCI-IT, we conducted a Confirmatory Factor Analysis (CFA) using the three original subscales (Radomsky and Gagné, 2020): Thoughts, Behavior, And Emotions (TBE), Importance of Staying in Control (ISC), and Body/Bodily Functions (BBF). In order to ensure that the three-factor structure was stable, a CFA was performed using data from 325 participants. We conducted the CFA using Mplus version 7. In accordance with the suggestion of Hu and Bentler (1999), we utilized multiple fit indices to assess the quality of the model fit: a chi-square test statistic and goodness-of-fit indices; Comparative Fit Index (CFI) , Tucker-Lewis Index (TLI) and Root Mean Square Error of Approximation (RMSEA) .If the Root Mean Square Error of Approximation (RMSEA) is less than or equal to 0.06 and the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) are both greater than or equal to 0.95, it is considered an excellent fit. If the RMSEA is less than or equal to 0.08 and the CFI/TLI are both greater than or equal to 0.90, the fit is considered adequate.

The data was well-fit by the three-factor model (χ^2 = 511.686, df = 106, CFI =.978, TLI =.975, and RMSEA =.073). Throughout this process, we primarily analyzed the goodness-of-fit indices

rather than relying on chi-square difference tests, as they can result in unreliable outcomes due to their susceptibility to the effects of sample size. Factor loads ranged from a low of 0.441(item 6) to a high of 0.948, with an average load of 0.772. All values are reported from the standardized model results after a Unit Variance Identification (UVI) approach.

Table 11
Fit Indices for three-factor Model

	$\chi 2$	df	CFI	TLI	RMSEA	CI
3-factor	511.686*	106	0.978	0.975	0.073	0.066;0.081
1-factor	896.014*	210	0.953	0.947	0.107	0.100;0.114

Note. P-Value is at 0.0000; The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used for chi-square difference testing in the regular way

Table 12
average factor loadings results

Items	Factor 1 (TBE)	Factor 2 (ISC)	Factor 3 (BBF)
Item 1: I'm afraid that I might not be able to keep my emotions in check	**0.829**	.012	.046
Item 2: If I have too many thoughts, or if they're too intense, I could lose control	**0.840**	.094	-.112
Item 3: Strong emotions can be dangerous because you might lose control	**0.858**	.021	-.034
Item 4: I am afraid of losing control of my mind	**0.869**	-.100	-.330
Item 5: If I can't keep my mind on a task, it means that I am losing control	**0.808**	-.099	.014
Item 8: I am afraid of losing control of my thoughts	**0.885**	-.143	-.225
Item 9: I'm concerned about my ability to handle my emotions	**0.452**	.140	-.031
Item 10: I'm afraid I might do something inappropriate or embarrassing	**0.676**	-.076	.035
Item 11: If I get too upset or anxious, I will lose control	**0.797**	.023	.144

Item 12: Strong emotions can be a sign that I'm losing control	**0.843**	-.148	.229
Item 13: If I get too emotional, I worry that I might never calm down	**0.812**	.055	.282
Item 16: I am afraid of losing control of my emotions	**0.913**	-.279	.021
Item 17: If I don't manage the thoughts, images or impulses in my mind, I will lose control	**0.890**	-.318	.009
Item 18: If I lose control over an urge or impulse, I will act on it even if I don't want to	**0.723**	-.117	.111
Item 14: It's important for me to stay in control of my thoughts	.057	**0.890**	-.048
Item 15: Staying in control is an important priority for me	-.015	**0.828**	.002
Item 19: It's important for me to keep my emotions from spiraling out of control	.313	**0.948**	.085
Item 6: I am afraid of losing control of my bladder and/or bowels	.243	-.017	**0.441**
Item 7: I am afraid of getting hiccups or of sneezing because I might not be able to stop	.259	-.015	**0.484**
Item 20: If I lost control, I would throw up	.339	-.032	**0.660**
Item 21: I am afraid of losing control of my body or of my bodily function(s)	.176	-.203	**0.813**
M|λ|		**0.772**	

Note: All values are reported from the standardized (STDYX Standardization) model results after a Unit Variance Identification (UVI) approach.

4.7. Convergent and Divergent Validity

Pearson correlations were used to assess the convergent and divergent validity of BALCI and relevant measures. Strong and statistically significant correlations (p-value >.001) were found between total BALCI scores and total scales of convergent measures, specifically OBQ-46, ASI-3, and ACQ, indicating excellent convergent validity. Divergent validity, as measured by Pearson correlations with a tool used to assess the desirability of controlling life events unrelated to

anxiety, namely DCS, was confirmed by extremely weak and negligible correlations. The stronger association of BALCI with convergent validity measures than with divergent measures is supported by the lack of statistical significance in the weak correlations with DCS (p-value > 0.05). Correlations with other questionnaires that investigate psychopathologies where beliefs about loss of control are relevant, such as the DEB-Q (r =.32), PDSS (r =.54), and SPS (r =.63), further support construct validity.

The OBQ-46, ACQ, and DCS scales have skewness and kurtosis values that fall within the specified range, indicating roughly symmetric distributions with varying degrees of peakedness. However, some scales deviate from the guideline, indicating possible deviations from normality. The VOCI scale has a positive skewness (1.09) and a leptokurtic shape (kurtosis = 1.10). The PDSS scale also has a positive skewness (0.99) and a slightly leptokurtic distribution (kurtosis = 0.43). These deviations from normality should be considered in subsequent analyses to ensure accurate interpretations.

Table 13
Other measures' reliability and measure of symmetry statistics

Measures (and subscales)	Cronbach's alpha	Number of items	skewness	kurtosis
VOCI	0.96	55	1.09	1.10
Checking	0.91	6		
Contamination	0.88	12		
Hoarding	0.83	7		
Indecisiveness	0.81	6		
Just right	0.86	12		
Obsessions	0.90	12		

OBQ-46	0.96	46	-0.06	-0.56
Perfectionism	0.91	11		
Responsibility for harm	0.87	10		
Control of thoughts	0.90	11		
Responsibility for omission	0.85	7		
Importance of thoughts	0.80	7		
ASI-3	0.92	18	0.45	-0.38
Physical	0.88	6		
Social	0.84	6		
Cognitive	0.87	6		
ACQ	0.86	30	-0.03	-0.58
Events	0.72	16		
Reactions	0.84	14		
DCS	0.77	20	-0.39	0.93
DEB-Q	0.92	33	0.33	-0.32
Restrained eating	0.93	10		
Emotional eating	0.95	13		
External eating	0.71	10		
PDSS	0.89	7	0.99	0.43
SPS	0.94	20	0.06	-0.69

4.7.1. BALCI-IT and VOCI

The correlation analysis reveals significant associations between the Beliefs About Losing Control Inventory (BALCI) and its subscales, Thoughts/Behaviour/Emotions (TBE), Importance of Staying in Control (ISC), and Body/Bodily Functions (BBF), and the Vancouver Obsessional Compulsive Inventory (VOCI). The total scores on BALCI have a strong positive correlation of .666 with the overall scores on VOCI, indicating a strong link between global beliefs about losing control and the broader spectrum of obsessive-compulsive traits. Furthermore, the individual subscales of BALCI have consistent positive correlations with VOCI. Specifically, the TBE component has a strong positive correlation of .642 with VOCI, emphasizing the link between thoughts, behaviors, and emotions related to losing control and overall obsessive-compulsive tendencies. The ISC component has a positive correlation of .515 with VOCI, indicating a moderate relationship between the importance of maintaining control and obsessive-compulsive tendencies. Similarly, the BBF component has a positive correlation of .523 with VOCI, indicating a moderately positive relationship between beliefs about bodily functions and obsessive-compulsive tendencies.

Table 14

Zero-order correlation between BALCI-IT and VOCI scores

Measure	VOCI						
BALCI-IT	Total	Contamination	Checking	Obsessions	Hoarding	Just Right	Indecisiveness
BALCI-Total	.666**	.433**	.432**	.653**	.526**	.569**	.611**
BALCI-TBE	.642**	.408**	.400**	.647**	.512**	.542**	.601**
BALCI-ISC	.515**	.364**	.377**	.433**	.391**	.483**	.438**
BALCI-BBF	.523**	.354**	.371**	.508**	.408**	.429**	.462**

Note. BALCI = Beliefs About Losing Control Inventory. TBE = Thoughts/Behaviour/Emotions. ISC = Importance of Staying in Control. BBF = Body/Bodily Functions. VOCI = Vancouver Obsessional Compulsive Inventory. **p < .01, ***p < .001

4.7.2. BALCI-IT and ASI-3

Table 15 depicts the relationships between beliefs about losing control (BALCI-IT) and anxiety sensitivity (ASI-3), including total scores and various dimensions such as physical, social, and cognitive aspects. Notably, strong positive correlations of .703 and .695 exist between overall beliefs about losing control and anxiety sensitivity to thoughts, behaviors, and emotions. This suggests that people with strong beliefs about losing control are more sensitive to anxiety in various aspects of their lives.

BALCI-ISC, which reflects the importance of maintaining control, has a moderate positive correlation (.550) with ASI-3. This implies that people who prioritize control may have higher anxiety sensitivity, particularly in cognitive dimensions. Similarly, the correlation of .474 between BALCI-BBF and ASI-3 indicates a moderate positive relationship, highlighting a link between beliefs about bodily functions and increased sensitivity to anxiety.

Table 15

Zero-order correlation between BALCI-IT and ASI-3 scores

Measure	ASI-3			
BALCI-IT	Total	Physical	Social	Cognitive
BALCI-Total	.703**	.437**	.598**	.723**
BALCI-TBE	.695**	.420**	.594**	.725**
BALCI-ISC	.550**	.417**	.425**	.533**
BALCI-BBF	.474**	.284**	.429**	.474**

Note. BALCI = Beliefs About Losing Control Inventory. TBE = Thoughts/Behaviour/Emotions. ISC = Importance of Staying in Control. BBF = Body/Bodily Functions. ASI = Anxiety Sensitivity Index. **p < .01, ***p < .001

4.7.3. BALCI-IT and ACQ

Table 16 presents zero-order correlations between scores on the Beliefs About Losing Control Inventory (BALCI-IT) and the Anxiety Control Questionnaire Revised (ACQ), examining total scores and subscales related to events and reactions. Notably, a robust negative correlation of -.594 is observed between overall beliefs about losing control and perceived control over anxiety-inducing events and reactions, suggesting that individuals with heightened beliefs about losing control may perceive less efficacy in managing anxiety.

the negative correlation of -.618 between BALCI-TBE and ACQ reinforces this association, indicating that thoughts, behaviors, and emotions related to losing control are linked to lower perceived control over anxiety-inducing situations. Additionally, a moderate negative correlation of -.286 is noted between the Importance of Staying in Control (ISC) component of BALCI and perceived control over anxiety, emphasizing that individuals who place less importance on staying in control may perceive reduced control over anxiety-inducing events and reactions.

the negative correlation of -.449 between BALCI-BBF and ACQ highlights that beliefs about bodily functions are associated with reduced perceived control over anxiety-inducing situations. This underscores the relevance of bodily function-related beliefs to one's perceived control over anxiety.

Table 16

Zero-order correlation between BALCI-IT and ACQ scores

Measure	ACQ		
BALCI-IT	Total	Events	Reactions
BALCI-Total	-.594**	-.457**	-.590**
BALCI-TBE	-.618**	-.478**	-.612**
BALCI-ISC	-.286**	-.191**	-.307**
BALCI-BBF	-.449**	-.370**	-.427**

Note. BALCI = Beliefs About Losing Control Inventory. TBE = Thoughts/Behaviour/Emotions. ISC = Importance of Staying in Control. BBF = Body/Bodily Functions. ACQ = Anxiety Control Questionnaire. **p < .01, ***p < .001

4.7.4. BALCI-IT and OBQ-46

Examining the zero-order correlations between the Beliefs About Losing Control Inventory (BALCI) and the Obsessive Beliefs Questionnaire (OBQ-46), total scores, and various subscales related to perfectionism, responsibility for harm, control of thoughts, responsibility for omission, and the importance of thoughts. These correlations provide important insights into the complex interactions between beliefs about losing control and obsessive beliefs.

A significant positive correlation (.661) exists between BALCI-Total and OBQ-46 Total, indicating a strong link between overall beliefs about losing control and obsessive beliefs. This suggests that people with strong beliefs about losing control may have more obsessive thoughts in a variety of domains.

when examining specific subscales, BALCI-TBE shows positive correlations with several OBQ-46 subscales. Notably, a positive correlation of .702 between BALCI-TBE and thought control on OBQ-46 suggests that thoughts, behaviors, and emotions related to losing control are linked to concerns about controlling thoughts. Furthermore, a positive correlation of .589 with responsibility for harm on the OBQ-46 suggests a link between these beliefs and a sense of responsibility for causing damage.

the BALCI-ISC component has a positive correlation of .639 with the OBQ-46 Total, implying that people who prioritize staying in control may have more obsessive beliefs. Interestingly, the BALCI-BBF component correlates positively with several OBQ-46 subscales, including responsibility for harm, control of thoughts, and the importance of thoughts, emphasizing the complex relationships between beliefs about bodily functions and specific obsessive beliefs.

Table 17
Zero-order correlation between BALCI-IT and OBQ-46 scores

Measure	OBQ-46					
BALCI-IT	Total	Perfectionism	Responsibility for harm	Control of thoughts	Responsibility for omission	Importance of thoughts
BALCI-Total	.661**	.511**	.527**	.702**	.512**	.474**
BALCI-TBE	.639**	.490**	.494**	.686**	.504**	.460**
BALCI-BBF	.421**	.301**	.371**	.422**	.327**	.338**
BALCI-ISC	.589**	.488**	.503**	.612**	.415**	.382**

Note. BALCI = Beliefs About Losing Control Inventory. TBE = Thoughts/Behaviour/Emotions. ISC = Importance of Staying in Control. BBF = Body/Bodily Functions. OBQ-46 = Obsessive Beliefs Questionnaire.
**p < .01, ***p < .001

4.7.5. BALCI-IT and DCS, PDSS, and SPS

the zero-order correlations that exist between the Beliefs About Losing Control Inventory (BALCI-IT) and three different measures is presented in table 18. These measures are the Desirability for Control Scale (DCS), the Panic Disorder Severity Scale (PDSS), and the Social Phobia Scale (SPS). These correlations offer a comprehensive analysis of the BALCI-IT's construct validity as well as its divergent validity.

With regard to the concept of divergent validity, the BALCI-IT demonstrates completely insignificant correlations with DCS scores, which range from -.066 to .090. The divergent validity of BALCI-IT is further supported by the fact that these modest correlations imply a weak association between beliefs about losing control and the general desire for control.

When we consider construct validity, we find that there are significant positive correlations between the scores on the BALCI-IT and the scores on both the PDSS and the SPS. To be more specific, the correlations with PDSS range from .319 to .546 and with SPS, they range from .427 to .626. Individuals who have heightened beliefs about losing control tend to exhibit more severe symptoms associated with panic disorder and social phobia, as indicated by these findings, which highlight a meaningful association between the two. This strong connection provides further evidence that the BALCI-IT is a construct that is valid in terms of its ability to capture and quantify the severity of symptoms that are specific to these psychological domains.

In conclusion, the in-depth analysis of correlations reveals that there are complex relationships between BALCI-IT and other measures. The fact that there is no correlation between the DCS scores and the beliefs about losing control is evidence that these beliefs are distinct from the

general desire to regain control. In the meantime, the construct validity of the BALCI-IT is highlighted by the positive correlations with the scores acquired from the PDSS and the SPS.

Table 18

Zero-order correlation between BALCI-IT and DCS, PDSS, and SPS scores

Measure	DCS Total	PDSS Total	SPS Total
BALCI-Total	-.066	.546**	.626**
BALCI-TBE	-.105	.539**	.621**
BALCI-ISC	.090	.319**	.427**
BALCI-BBF	-.018	.492**	.472**

Note. BALCI = Beliefs About Losing Control Inventory. TBE = Thoughts/Behaviour/Emotions. ISC = Importance of Staying in Control. BBF = Body/Bodily Functions. OBQ-44 = Obsessive Beliefs Questionnaire. DCS = Desirability for Control Scale. Panic Disorder Severity Scale (PDSS). Social Phobia Scale (SPS). **p < .01, ***p < .001

4.7.6. BALCI-IT and DEBQ

For total scores, BALCI-Total has a .320 positive correlation with DEBQ Total, indicating a modest but significant relationship between beliefs about losing control and general eating behavior. Furthermore, BALCI-TBE has a positive correlation of .328 with DEBQ Total, emphasizing the link between thoughts, behaviors, and emotions related to losing control and overall eating habits.

When analyzing DEBQ subscales, both BALCI-Total and BALCI-TBE show positive correlations with all three subscales (restrained eating, emotional eating, and external eating). Notably, the correlations for Restrained Eating are stronger, ranging from .251 to .260 indicating a stronger link between beliefs about losing control and a preference for controlled or restrained eating behaviors.

When considering BALCI components, Importance of Staying in Control (ISC) has positive correlations with all DEBQ subscales, indicating that people who value control may have certain eating behaviors. However, these correlations are generally smaller in magnitude than those with BALCI-Total and BALCI-TBE, emphasizing the nuances of these relationships.

In contrast, the Body/Bodily Functions (BBF) component of BALCI has more modest correlations, particularly with Restrained Eating and Emotional Eating. Notably, a positive correlation of .144 between BALCI-BBF and DEBQ Total indicates a link between beliefs about bodily functions and general eating behavior.

Table 19

Zero-order correlation between BALCI-IT and DEBQ scores

	DEBQ			
Measure	Total	Restrained	Emotional	External
BALCI-Total	.320**	.260**	.240**	.198**
BALCI-TBE	.328**	.251**	.255**	.209**
BALCI-ISC	.258**	.241**	.192**	.108
BALCI-BBF	.144**	.157**	.065	.121*

Note. BALCI = Beliefs About Losing Control Inventory. TBE = Thoughts/Behaviour/Emotions. ISC = Importance of Staying in Control. BBF = Body/Bodily Functions. OBQ-44 = Obsessive Beliefs Questionnaire. Dutch Eating Behavior Questionnaire (DEBQ). Restrained eating, Emotional eating, and External eating. **p < .01, ***p < .001

Chapter 5. Discussion

5.1. Discussion

We confirmed the findings in the Italian population, consisting of three factors; beliefs about losing control over one's thoughts, behavior, and emotions (TBE; Factor 1), beliefs about the importance of staying in control (ISC; Factor 2), and beliefs about losing control over one's body/bodily functions (BBF; Factor 3). Nonetheless, there are some considerations to be made when comparing the loadings of the items and their power to explain the variance observed. As an instance, items 6 and 7, governed under factor BBF, has shown to carry a relatively lower amount of original information contained that can be extracted from the third factor related to beliefs about maintaining control on body/bodily functions. Of note, according to Carpenter (2018), a factor load of 0.32 is considered a potential minimum score, while values ranging from 0.30 to 0.40 could also be used as criteria for factor loads. Also, results from an “if item dropped” item reliability analysis, shows that dropping items 6 and 7 can increase both measures of scale score reliability; Cronbach’s alpha and McDonald’s Omega. This means that attitude of Italians towards the importance of maintaining control over bladder and/or bowels and getting hiccups or of sneezing are less associated with either an internalized shame or external embarrassment. This finding can be explained by comparing incidence of each of the physical symptoms across the different countries and geographics; objectively, the prevalence of irritable bowel syndrome in Italian urban and rural areas (9.9% and 4.4% respectively) is considerably smaller, nearly as half as Canada’s rate of IBS (Usai et al., 2010). In fact, Canada has one of the highest rates of IBS in the world, estimated 18% vs 11% globally (Lovell et al. 2012). Therefore, this difference can highlight the possible difference in attitudes towards showing these bodily symptoms in public or in private which subsequently, can be regarded as a sign of stress/strain.

These perceptions are therefore more associable with a sense of control among Canadians than an average Italian population. on the same scope of comparison, item 7 which surrounds respiratory and allergic symptoms (hiccups, sneezing) can be explained via the same line of reasoning in which the difference between the incidence rate of a given respiratory allergy across the geographic locations is evident. According to Olivieri (2002), The overall prevalence of self-reported allergic rhinitis was 15.9% based on the information on rhinitis collected in northern Italy through standardized methods whereas According to the Canadian Allergy, Asthma and Immunology Foundation, one in every four or five Canadians (20 to 25% of the population) has allergic rhinitis. This finding is aligned with the recommendation put forward in the original paper as to focus on increasing the number of items pertaining to losing control over one's body, which can subsequently increase the power of this factor in its relevance and explainability.

Upon the confirmatory factor analysis, three factors replicated themselves within the Italian population. in other words, the anticipated number of factors and loadings of measured variables aligned with theoretical expectations. Additionally, BALCI-IT has captured an array of expected facets of on an obsessive-compulsive thought-behavior-emotion axis, relating to the convergency with measures of VOCI, targeting cognitive structure of OCD, ACQ, to measure perceived control over anxiety-provoking situations, ASI-3, for anxiety sensitivity and OBQ-46 to assess obsessive beliefs. In contrast, as expected, the BALCI-IT has diverted from the measure of a general desire for control over life (DCS).

A novel finding of this study is the hypothesized connection between underlying constructs of the Panic Disorder Severity Scale and the Social Phobia Scale and the factors compiling the BALCI-IT. While the cumulative scores of the scales mentioned are strongly correlated (the total score of BALCI-IT is correlated with PDSS and SPS total scores at .54 and .62 respectively),

nearly as great and significant as the magnitude of the zero-order correlation found between most of the measures intended for convergent validity. In this case, we can evidently argue that the newly developed BALCI-IT, is strongly connected with measure of phobic avoidance of situations, phobic avoidance of physical sensations, impairment in work functioning, impairment in social functioning, and symptoms of social phobia and self consciousness over time. Subsequently, we also observed an almost equal amount of association between the *thoughts, behavior, and emotions* factor and PDSS and SPS overall scores. This is however of anticipation given the strong interdependency between the total score of BALCI-IT and the TBE factor at .98 (See table 10). Those areas measured by the TBE factor within the BALCI-IT are, therefore, strongly relatable to a broader spectrum of anxiety disorders such as panic-focused anticipatory anxiety and SPS score that is a metric of social phobia. It is of note that the SPS itself has demonstrated discriminant validity, with the scale distinguishing between clinical presentations of anxiety (i.e. social phobia, agoraphobia and simple phobia), and between social phobic and non-clinical (student and community) samples (Mattick & Clarke, 1998). Low control perceptions (Cloitre, Heimberg, Liebowitz, & Gitow, 1992), mental images of losing control in social situations (Hackmann, Surawy, & Clark, 1998), and negative beliefs about the repercussions of losing control over emotions (Spokas, Luterek, & Heimberg, 2009) have all been linked to social anxiety. Moreover, research has demonstrated that low perceived control is a predictor of perceived threat in social situations (Hofmann, 1999).

According to one experiment, during a social interaction task with an actor, manipulating beliefs about losing control (via false feedback after a challenging task) increased anticipatory anxiety, decreased performance perceptions, and increased perceived losses of control (Radomsky, 2020). Another experiment by Gagné, Radomsky, and O'Connor (2021) used alcohol expectations to

modify thoughts about losing control. The subjects were offered juice, alcohol, or a placebo (non-alcoholic vodka) and they were all informed that drinking can make people lose control over their speech and behavior. Following a "getting to know you" exercise with an actor, participants rated their level of fear and their ability to understand what had happened (Rachman, Grüter-Andrew, & Shafran, 2000). Compared to controls, participants in the alcohol and placebo groups reported higher levels of anxiety during the task and higher levels of post-event processing one day later. Therefore, it appears plausible that ideas about losing control were used to provoke anticipation of intoxication and encourage symptoms related to social anxiety. Alternative (but complementary) models of social anxiety suggest that perceived anxiety control, or the extent to which one believes they have control over their anxiety response, plays a key role in the maintenance of symptoms (Hofmann, 2005). In other words, individuals with social anxiety avoid social situations in part because they fear losing control over their emotional response (i.e., “emotional bursts”, Hofmann, 2005, p. 887). This idea has been captured in item 3 (“Strong emotions can be dangerous because you might lose control”), item 9 (“I'm concerned about my ability to handle my emotions”), and item 12 (“If I get too emotional, I worry that I might never calm down”) in the BALCI Italian version.

As posited in the third hypothesis of this study, we expected an improved correlation between scores from ASI-3 with BALCI compared to the Anxiety Sensitivity Index (ASI-3, Taylor et al., 2006; ASI, Reiss et al, 1986). Scores of a given participant from ASI-3, as expected, showed a strong association with that of BALCI-IT ($r = 0.703$, $p < .001$). In addition, the highest correlation is between the cognitive subscale of ASI-3 (6 items; 14,18,10,16,2,5) and the TBE factor of BALCI-IT (14 items; 2, 3, 4,5,6,9,10,11, 12, 13, 14, 17, 18, 19) at 0.725. The justification for this was that specific types of cognitive concern have been linked to all four

anxiety disorders: panic disorder (PD), obsessive compulsive disorder (OCD), social anxiety disorder, and generalized anxiety disorder (GAD). Also, according to research, individuals with OCD are more likely than control participants to overestimate the dangers of cognitive dyscontrol. This is consistent with modern cognitive models of OCD (Frost & Steketee, 2002), which contend that misguided beliefs about the negative effects of cognitive dyscontrol are a contributing factor in the development of OCD. In contrast, on a relatively similar point of view in comparison, lowest correlation score existed between BALCI-IT BBF subscale, and ASI-3 physical subscale. ($r = 0.284$, $p < .001$). Analytically comparing the ASI-3 physical items and the BALCI BBF items, we can observe several differences in the nature of the fears they address: The ASI-3 physical items primarily address fears associated with specific bodily sensations such as chest pain, rapid heartbeat, upset stomach, and so on. On the other hand, the BALCI BBF items are more concerned with fears of losing control over bodily functions such as bladder and bowel control, hiccups, sneezing, vomiting, and so on. More, the ASI-3 physical items typically focus on fears associated with an immediate physical threat or the perceived risk of serious illness or harm (e.g., heart attack, choking, inability to breathe properly). In contrast, the BALCI BBF items appear to capture fears about embarrassment or social discomfort caused by a loss of control over bodily functions. Another matter is cognitive interpretation vs. physical response: The ASI-3 physical items reflect concerns and fears sparked by specific bodily sensations or symptoms, which frequently lead to cognitive interpretations of potential health risks. In contrast, the BALCI BBF items reflect fears about involuntary bodily functions or behaviors, which may not necessarily involve cognitive interpretations but rather concerns about loss of control and its consequences. Most plausible explanation, in our view, for the mentioned finding is that the ASI-3 physical items primarily assess anxiety related to physical symptoms and

perceived health threats, whereas the BALCI BBF items assess fears related to loss of bodily control and associated social or functional consequences. As such, the underlying constructs being measured may not overlap substantially, contributing to the low correlation between the two sets of items.

Upon examining the anticipated correlation between eating behavior and fear of losing control, the weak correlation between the two sets of items is expected given their different foci. The DEBQ items focus on eating behaviors and attitudes, while the BALCI-IT items cover a wider range of emotional and control issues. A weak positive correlation of .32 suggests that concerns about losing control over eating behaviors may overlap with concerns about losing control over thoughts, emotions, or bodily functions. The strength of this association is weak, suggesting that while the two sets of concerns may be related, they are largely distinct.

5.2. Limitations and Future Directions

Of crucial note, we would like to point out to particular matters in our study that denote the limitations. The first limitation is rather inherent to the nature of the study; the contribution of cross-cultural differences to the results remains unclear. Although the initial purpose of this study was to assess the adaptability of the BALCI, no cross-cultural comparisons could be made for that this study serves as the first to adapt BALCI to Italian. Some items were found to carry less factor loadings, thereby explaining less variance in the data. Although conjectures were made after examining certain facts between the two countries, a reliable and evidence-based cross-cultural research is needed to confirm our speculation in our CFA investigation. An easy to avoid shortcoming of this study regards an administrative error in the presentation of the survey. an item in the BALCI-IT (item 9) was not presented to the participants and for this reason, scores for some participants were standardized, averaged and replaced with the mean score. Regular

checks and more strict data quality control procedures are strongly recommended to avoid this issue in the future.

More, the data were collected from a sample representing a non-clinical demographic, primarily consisting of university students aged between 18 and 32 years old. The majority of participants were women, with a limited number of male participants, posing a socio-demographical shortcoming in our sample population. Moreover, the extent to which different sociodemographic characteristics of our population contribute to formulation of beliefs about losing control remains unexplained. one theory could be that there might be mediator effects in the formulation of beliefs about losing controls among individuals of different age groups, employment status and with different levels of education. For example, individuals in stable employment may have a different perspective on control compared to those facing job insecurity or unemployment. Future research should accommodate a relatively equal proportion of different genders and as a necessary element, a clinical sample, and to investigate how demographic factors interact with cognitive, social, psychological, and environmental mechanisms to influence beliefs about losing control.

Third, we have used The Desirability of Control Scale (DCS) to measure the extent to which BALCI-IT, assessing fear of losing control, is unrelated or negatively related to a measure of individual differences in general desire or need for control over life events. However theoretically appropriate, the DCS was not originally validated in the target language (Italian) in a separate study to be used as a generalizable and valid tool to assess a general desire for controlling one's life cross culturally. Of note, general measure of the locus of control screened through Levenson IPC scale (1973) translated and adapted for the Italian context by Nigro and Galli (1988) could be substituted. On the other hand, certain measurement tools might be useful

to conduct convergence with related constructs. As an instance, sense of control is captured by the Shapiro Control Inventory (SCI: Shapiro, 1994) which "measures domain-general and domain-specific perceived control, positive and negative control mechanism, and motivation for control." Interestingly, a handful of studies have incorporated the use of this tool in association with obsessive compulsive symptoms (See Froreich et al., 2016). Future studies could complement the construct validation of BALCI-IT using validated measurement tools that are available in the Italian language for a more reliable adaptation.

Forth, the test-retest reliability was conducted using a sample size of 24 participants. This number does not meet the minimum criteria recommended in the literature as according to Imasuen (2022) reliability studies should not be conducted using sample sizes of 20 or 30. A minimum of 100 participants is required for a reliability study to be considered valid, as previously demonstrated.

5.3. Conclusion

This study set out to adapt, explore, and validate the factorial structure of the Beliefs About Losing Control Inventory (BALCI), originally developed in English, to an Italian non-clinical population for the first time. Many measures were taken into account while assessing the reliability and validity of the newly adapted BALCI. We aimed to confirm the three-factor structure of BALCI due to the presence of particular influencing factors on the process of adaptation, namely methodological, cultural, and theoretical factors. For this reason, we conducted a preliminary explanatory factor analysis to ensure the replicability of the original study of BALCI which yielded a three-factor model. In addition, we confirmed the three-factor structure for the BALCI-IT with adequate model fit among a sample of non-clinical Italian population. The methodology used in this study allowed for robust assessments of internal

consistency and reliability, with Cronbach's alpha and McDonald's Omega indicating excellent consistency for the Beliefs About Losing Control Inventory (BALCI-IT) and its subscales. Test-retest reliability was demonstrated by a moderate correlation over a three-week period. Validity tests revealed strong convergent validity with measures of anxiety sensitivity, obsessive-compulsive traits, panic disorder severity, and social phobia, indicating a link between beliefs about losing control and various psychological constructs. Divergent validity was confirmed by weak correlations with the Desirability for Control Scale (DCS), indicating that beliefs about losing control differ from a general desire for control. Positive correlations between BALCI-IT scores and symptoms of panic disorder, social phobia, and eating behaviors bolstered construct validity, emphasizing the tool's ability to capture and quantify specific psychological dimensions.

5.4. Ethics approval and Consent for participation

Informed consent was obtained from all participants. This research was granted approval by the Comitato Etico della Ricerca Psicologica of University of Padova.

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Appendix 1

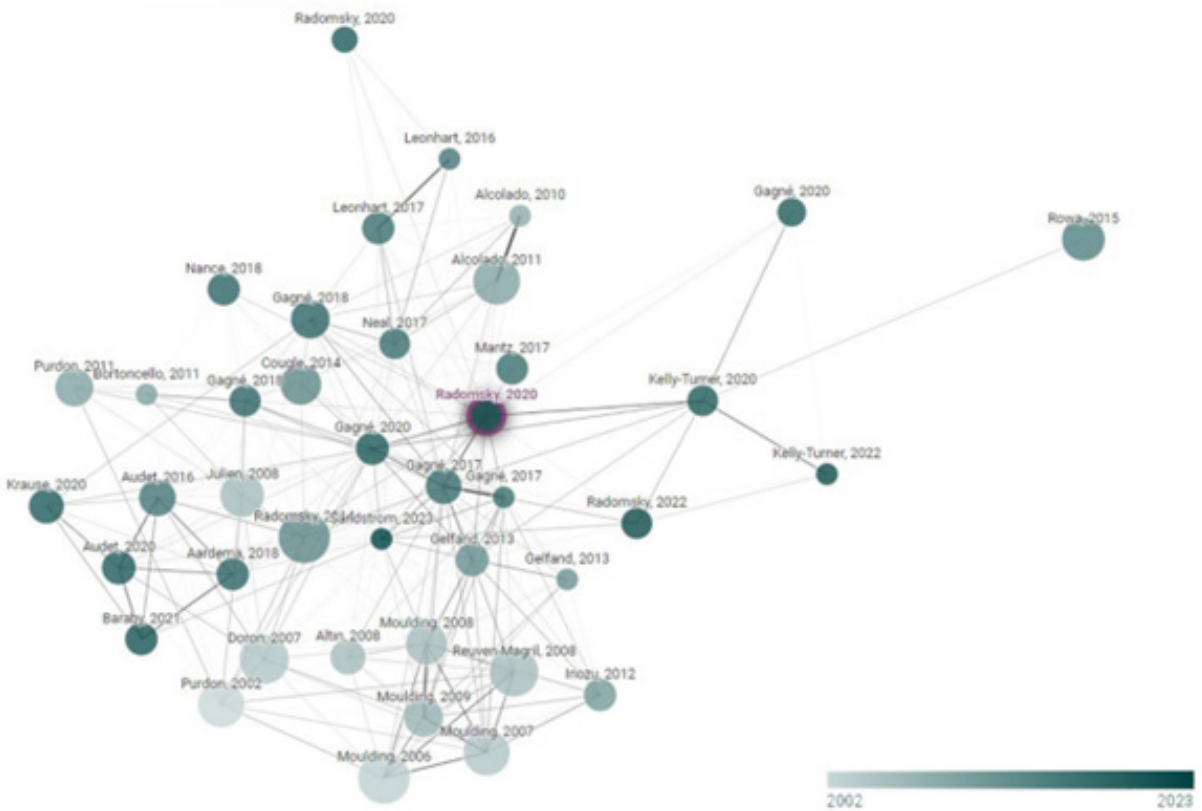

Figure 1. Network of the literature related to the origin paper: The development and validation of the Beliefs About Losing Control Inventory (BALCI) by A. Radomsky, Jean-Philippe Gagné (2020). Each node is an academic paper related to the origin paper. Papers are arranged according to their similarity (this is not a citation tree). Node size is the number of citations. Node color is the publishing year. Similar papers have strong connecting lines and cluster together.