Testing the Italian version of the Cyberchondria Severity Scale and a metacognitive model of Cyberchondria

Running title: Cyberchondria: a metacognitive model

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Abstract

Cyberchondria refers to the tendency to excessively and compulsively search for online medical information despite the distress experienced, with consequent impairment of daily-life activities. The current two studies sought to explore: (i) the factor-structure of the Italian version of the Cyberchondria Severity Scale; and (ii) a metacognitive model of cyberchondria.

Participants were Italian community adults who reported using the Internet to search for health-related information (Study 1: N = 374, Study 2: N = 717). Results from Study 1 supported the Italian version of the CSS exhibiting a five-factor structure, with the resulting scales demonstrating good internal consistency, five-week test-retest reliability, and generally strong correlations with indices of health anxiety. In Study 2, results of a path analysis showed that the negative metacognitive belief domain ("thoughts are uncontrollable") shared the strongest direct association with each of the five dimensions of cyberchondria, followed by beliefs about rituals. Consistently, the strongest indirect associations were found between "thoughts are uncontrollable" and all the five cyberchondria dimensions via beliefs about rituals. These results provide support for an Italian version of the CSS and the metacognitive conceptualization of cyberchondria.

Key practitioner message:

-Italian professionals can now use the Italian version of the Cyberchondria Severity Scale to assess cyberchondria.

-Both the five- and four-factor higher order structures of the Italian Cyberchondria Severity Scale are tenable.

-The conceptualization of cyberchondria in the metacognitive framework is supported.

-Prevention and treatment interventions for cyberchondria specifically targeting metacognitive beliefs (especially uncontrollability of thinking) might be effective.

Introduction

International statistics have been indicating that there is an increasing number of people who seek for health information online worldwide (McMullan, Berle, Arnáez, & Starcevic, 2019), with about 35% of Italian Internet users searching for medical information (Eurostat, 2018). Despite the usefulness of the Internet to easily access information and promote health behaviors (Batigun, Gor, Komurcu, & Erturk, 2018; Webb, Joseph, Yardley, & Michie, 2010), it has been shown that Internet searches for health information might expose inexperienced users to potential harms due to self-diagnosis, self-treatment (White & Horvitz, 2009), and increasing levels of health anxiety (in terms of fears and worry about a perceived symptom, ranging from no concerns to pathological anxiety; Bailer, Kerstner, Witthöft, Diener, Mier, & Rist, 2016). To this regard, a recent meta-analysis showed a medium correlation ($r = .34$) between online health information seeking and health anxiety (McMullan et al., 2019). Although there is no consensus on whether Internet searches are the cause or the consequence of health anxiety, it is likely that online health information seeking significantly contributes to greater anxiety about ones' health status and thus worsening possible pre-existing health anxiety (Starcevic & Berle, 2015). Therefore, beyond the mere search for health information, the term "cyberchondria" indicates the tendency not only to excessively search for online medical information but also to compulsively search despite the distress experienced as a result of such searches, and consequent impairment of daily-life activities (Starcevic & Berle, 2013). Moreover, the overloaded health information found on the Internet likely lead users to seek for reassurance by consulting multiple medical professionals, thus potentially deteriorating the relationship with medical professionals (McElroy & Shevlin, 2014). From this viewpoint, cyberchondria appears to be a multi-dimensional phenomenon that includes health distress, safety behaviors, and negative consequences. In that,

cyberchondria may make individuals anxious about their health following the online searches or constitutes a coping strategy for health anxious individuals (Starcevic, 2017).

Several studies have highlighted possible correlates of cyberchondria: for example, symptoms of health anxiety, quality of life, healthcare utilization (Mathes et al., 2018), intolerance of uncertainty (e.g., Fergus, 2015; Norr, Albanese, Oglesby, Allan, & Schmidt, 2015b), generalized problematic Internet use (Fergus & Spada, 2017), and obsessive-compulsive disorder (e.g. Fergus & Russell, 2016). However, there is a lack of studies which have attempted to understand the psychological mechanisms underlying cyberchondria.

Importantly, there is evidence that metacognitive beliefs play an important role in health anxiety – a construct strongly related to cyberchondria. For example, metacognitive beliefs emerged as independent predictors of health anxiety symptoms over and above other related constructs, such as neuroticism, catastrophic misinterpretations, somatosensory amplification, and dysfunctional cognitions (Bailey & Wells, 2013; 2016; Melli, Carraresi, Poli, & Bailey, 2016). Moreover, beliefs that thoughts are uncontrollable have been found to be related to health anxiety symptoms across several studies (e.g. Bailey & Wells, 2013; 2016; Melli et al., 2016; Melli, Bailey, Carraresi, & Poli, 2018). In alignment with these findings, Fergus and Spada (2017) first suggested that a metacognitive model of cyberchondria might be tenable in that metacognitive beliefs about the uncontrollability of health-related thoughts were significantly associated with cyberchondria. The metacognitive model of cyberchondria proposed by Fergus and Spada (2018) (Figure 1) follows Wells and Matthews's (1996) Self-Regulatory Executive Function (S-REF) model. Briefly, metacognitive beliefs initiate and maintain self-regulatory strategies within the S-REF model. In the context of cyberchondria, Fergus and Spada (2018) proposed that metacognitive beliefs about the benefits of health-related thoughts (e.g., "Worrying about my health will help me cope," Bailey & Wells, 2015) contribute to a state of health-related worry when confronted with a health-related trigger (e.g., thought, image, information). Metacognitive beliefs about the dangers of health-related thoughts (e.g., "Worrying about illness is

likely to make it happen," Bailey & Wells, 2015) are proposed to further contribute to health-related worry, along with efforts to control worry to avert associated threat. In this context, Internet searches for health information are conceptualized as an attempt to avert threat associated with health-related worry. Fergus and Spada (2018) proposed that such searches initially are engaged in because individuals hold beliefs about the benefits of the behavior (i.e., beliefs about rituals; e.g., "I need to complete online searches for health information, otherwise I will never have peace of mind"). The repetitive, distressing quality of the searches is proposed to occur, in part, because of that elevated perceived need to engage in the behavior (as reflected by beliefs about the rituals) and through elevated requirements held to terminate the searches (i.e., stop signals; e.g., "An important signal of when I can stop searching online for health information is when I have no worries that bad things will happen"). Difficulties achieving the stop signals lead to further health-related worry and, ultimately, repetitive engagement in the searching behavior. Consistent with the model, Fergus and Spada (2018) found that metacognitive beliefs about health-related thoughts, beliefs about rituals, and stop signals each accounted for unique variance in cyberchondria.

Given the emerging interest in online medical information showed by the Italian National health Service (e.g., Ibsa Foundation for Scientific Research, 2017), and given the potential usefulness of the Cyberchondria Severity Scale (CSS; McElroy & Shevlin, 2014) for extending our knowledge of cyberchondria, it is necessary to further evaluate the psychometric properties of an Italian version of the scale to be used in future studies (Study 1). In addition, highlighting the psychological mechanisms underlying cyberchondria might be of interest to inform clinical and prevention intervention. Therefore, the aim of the present study (Study 1) was to validate the factor structure of the CSS in Italian adults. As a second aim, and described more fully below, in Study 2, was to test the metacognitive model of cyberchondria as proposed by Fergus and Spada (2018).

Study 1 – Validation of CSS in Italian Adults

A widely used measure to assess cyberchondria is the Cyberchondria Severity Scale (CSS; McElroy & Shevlin, 2014) which, in its first version, included 33 items and five factors, namely *compulsion* (i.e. online searches interrupt daily life activities), *excessiveness* (i.e. repetitive searches), *distress* (i.e. negative emotional states related to searches), *reassurance* (i.e. need to seek out for medical opinion), and *mistrust of medical professional* (i.e. distrust of medical services). McElroy and Shevlin (2014) showed that the five factors tapped both the dimensions of the phenomenon and one general factor of cyberchondria. In subsequent validation studies (e.g. Fergus, 2014; Fergus, 2015; Mathes, Norr, Allan, Albanese, & Schmidt, 2018), the five-factor model was replicated but higher-order confirmatory factor analysis indicated that *mistrust* does not tap the same construct as other CSS subscales as it shares only small variance with both the total score of the CSS and the other subscales. Norr and colleagues (2015a) proposed that the scale measures both a general factor and a lower-order dimensions. More, recently McElroy and colleagues (2019) proposed also a short version of the CSS (12 items) removing the mistrust factor. As cyberchondria seems universally problematic, the CSS has been successfully translated in several languages (e.g., German, Turkish, Polish, Brazilian Portuguese), showing good psychometric properties across countries and proposing suggestions to refine the CSS (Bajcar, Babiak, & Olchowska-Kotala, 2019; Barke, Bleichhardt, Rief, & Doering, 2016; Selvi, Turan, Sayin, Boysan, & Kandeger, 2018; Silva, Andrade, Silva, & Cardoso, 2016). For example, in the German version of the short form of the scale, some items loaded on different factors (see Barke et al., 2016) whereas in the Polish version the four-factor model (excluding mistrust) was chosen. For the purpose of this study, the original, 33-item version of the CSS was tested as this is the first attempt to adapt the scale in Italian language.

Materials and methods

Participants

A convenience sample of 374 adults participated in this study. Four participants were excluded as they reported to have a serious disease (such as, multiple sclerosis and cancer). Moreover, 27 participants were removed due to high amount of missing values (more than 70% of the answers).

The final sample comprised 343 participants (87% females, M_{age} 25.76 years, SD=5.33, range 18-59). The sample size provided sufficient statistical power for data analysis (i.e., 10 participants for every free parameter estimated; Schreiber, Nora, Stage, Barlow, & King, 2006) and was used to test the factorial validity of the scale. Approximately 14% of the sample reported a common health condition, such as lactose intolerance, acne, and stomachache. Of the total sample, a subsample of 112 participants (80% females; M_{age}=22.71 years, SD=2.73, range 20-43 years) was used to test the test-retest reliability of the CSS.

Respondents were mainly Italian university students (62.7%) or workers (19.8%) [others were student workers (14.3%) or unemployed (3.2%)], and received at least a three year college degree (76.4%).

Procedure

The sample was recruited online by sending the link of a questionnaire to e-mail lists of the University of Padova and sharing the link in social network sites groups. The survey was accessible online from 15th November 2017 to 15th January 2018. Participants were asked to give their consent in the first page of the study website, which explained the purpose of the study and assured the confidentiality of the responses. Participants were then directed to a second page containing demographic information and a series of self-report scales (see Measures section).

A subsample (N= 120; 35% of the whole sample) was asked to complete the questionnaire for the first time during the first week of December 2017, and to complete it again after a five-week period of time, in order to analyze the test-retest reliability (e.g., Lucock & Morley, 1996). Approximately 93% of the subsample (112 out of 120 participants) completed the questionnaire at time 2. This procedure allowed analyzing the test-retest reliability of the scale including participants

who had completed the questionnaires approximately in the same time of the year. Participants provided a personal and confidential code at the beginning of the questionnaires that was then used to pair the answers of the test and re-test. The current research received formal approval by the local Ethics Committee for Psychological Research at the University of Padova, Italy.

Measures

Cyberchondria Severity Scale (CSS). The CSS (McElroy & Shevlin, 2014) comprised 33 items used to assess cyberchondria. Items were translated from English to Italian and back-translated in English by two independent bilingual psychologists expert in the field. Participants were asked to rate the frequency of each item on a 5-point scale (from (1) "never" to (5) "always").

The original scale comprised five subscales, namely "compulsion" (8 items), "distress" (8 items), "excessiveness" (8 items), "reassurance" (6 items), and "mistrust of medical professional" (3 items to be reversed). In addition, in the original version of the scale, these factors give an overall index score for the construct of cyberchondria. Higher scores on the scale indicate higher levels of cyberchondria. The full list of items (in English) is reported in Table 1 along with item analyses.

Health Anxiety Questionnaire (HAQ). The Italian version (Melli, Coradeschi, & Smurra, 2007) of the HAQ (Lucock & Morley, 1996) contains 21 items that assess health anxiety. Participants were asked to answer each of them on a 4-point scale (from (1) "never or rarely" to (5) "most of the time"). The Cronbach's alpha for the HAQ was .93 [90% CI: .92-.94].

Problematic Internet Use. The Italian version (Fioravanti, Primi, & Casale, 2013) of the Generalized Problematic Internet Use Scale 2 (Caplan, 2010) contains 15 items that assess problematic Internet use in terms of preference for online social interactions, mood regulation, compulsive use, cognitive preoccupation and negative consequences due to Internet use. Participants were asked to answer each item on a 8-point scale (from (1) "definitely disagree" to (8) "definitely agree"). The Cronbach's alpha for the GPIUS2 was .90 [90% CI: .89-.91].

Statistical Analysis

A series of confirmatory factor analyses (CFA) using Mplus 8.2 (Muthén & Muthén, 1998-2017) was run following the approach presented in a previous validation of the scale (Fergus, 2014). Weighted least estimation with robust standard errors and mean and variance (WLSMV) estimator for ordinal items was adopted. The following indices were used to assess the fit of the model: (1) chi-square (χ^2); (2) comparative fit index (CFI; acceptable fit ≥ .90); (3) Tucker-Lewis Index (TLI; acceptable fit ≥ .90); and (4) root mean square error of approximation (RMSEA; acceptable fit ≤.08) (Browne & Cudeck, 1993). Cronbach's alpha was employed to assess internal consistencies of the scale and its dimensions. To test the convergent validity of the CSS score, bivariate correlations were run between the CSS total score, the CSS dimensions, and the HAQ. Moreover, a further correlation analysis was run to test the reliability of scale in a subsample. To test the divergent validity of the CSS a bivariate correlation was run between the CSS total score and the GPIUS2 total score.

Results

Testing the Italian version of the original CSS

First, a one-factor first-order model was tested collapsing the 33 items on a single latent construct. Results of the CFA for this model showed a very poor fit to the data (Table 2). All standardized loadings were significant at the p <.001 level and ranged from .347 to .947, with the exception of item 24 (standardized loading= .161; p = .002).

Second, a correlated five-factor first-order model was tested using the respective observed scores of the five CSS dimensions to compute five latent variables. Results of the CFA for this model showed a good fit to the data (Table 2). All standardized loadings were significant at the p <.001 level (mean loading for compulsion factor =.927; mean loading for distress factor = .859; mean loading for excessiveness factor = .737; mean loading for reassurance factor = .810; mean loading for mistrust factor = .737). Though significant, item 24 showed a low loading (standardized loading = .189; p = .001) in the excessiveness factor.

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Third, a second-order model was tested in which the five first-order latent variables loaded onto the higher-order construct of cyberchondria. Similarly to the five-factor first-order model, results of the CFA for this model showed good fit to the data (See Table 2). Table 1 shows the factors loadings for this model. All the five latent variables significantly contributed to the high-order cyberchondria construct (compulsion factor loading =.867 (p <.001); distress factor loading = .854 (p <.001); excessiveness factor loading = .925 (p <.001); reassurance factor loading = .688 (p <.001)) with the lowest loading observed for mistrust factor (mistrust factor loading = .248 (p <.001)).

The Cronbach's alphas for the subscales were as follows: "compulsion" (**α** = .95 [95% CI .95-.96]), "distress" (**α** = .93 [95% CI .91-.94]), "excessiveness" (**α** = .85 [95% CI .82-.87]), "reassurance" (**α** = .84 [95% CI .82-.87]), and "mistrust" (**α** = .85 [95% CI .82-.87]). The overall Cronbach's alpha for the total scale was **α** = .95 [95% CI .94-.96]).

To sum up, the one-factor first-order model appeared as the worst model, whereas the five-factor first- and second-order models showed the best comparable fit. However, despite the good fit to the data and in line with previous findings (Fergus, 2014; McElroy & Shevlin's, 2014), item 24 ("I visit trustworthy sources when researching symptoms or perceived medical conditions online") showed the lowest factor loading (.19) and it is below the threshold of .30 in order to be considered sufficiently reliable (Comrey & Lee, 1993). Moreover, in both the five-factor models, mistrust factor showed a modest, yet significant, contribution to the overall construct of cyberchondria. Therefore, we subsequently tested the three models first removing item 24 and then removing also the mistrust factor.

Testing the Italian revised version of the CSS

First, the same high-order CFA approach used above was used to test the three CFA removing item 24. Results are shown in table 2 (Revised CSS 1). The one-factor first-order model was tested loading the 32 items on a single latent construct. Results of the CFA for this model showed an inadequate fit to the data (Table 2). All standardized loadings were significant at the p < .001 level

and ranged from .350 to .947. Then, results of the CFA for the five-factor first-order model showed a good fit to the data (Table 2). All standardized loadings were significant at the $p <.001$ level and ranged from .495 to .948. Then, results of the CFA for the five-factor second-order model showed a good fit to the data (Table 2). All the five latent variables significantly contributed to the high-order cyberchondria construct (compulsion factor loading =.867 ($p < .001$); distress factor loading = .854 ($p < .001$); excessiveness factor loading = .925 ($p < .001$); reassurance factor loading = .686 ($p < .001$)) with the lowest loading observed for mistrust factor (mistrust factor loading = .250 ($p < .001$).Second, the three models were tested removing both item 24 and the mistrust factor (table 2; Revised CSS 2). Results from the one-factor first-order model (29 items) showed a poor fit to the data (Table 2). All standardized loadings were significant at the $p <.001$ level and ranged from .495 to .948. Then, results of the CFA for the four-factor first-order model showed a good fit to the data (Table 2). All standardized loadings were significant at the $p <.001$ level and ranged from .672 to .958. Then, results of the CFA for the four-factor second-order model showed a good fit to the data (Table 2). All the four latent variables significantly contributed to the high-order cyberchondria construct (compulsion factor loading =.868 ($p <.001$); distress factor loading = .854 ($p <.001$); excessiveness factor loading = .925 ($p <.001$); reassurance factor loading = .684 ($p <.001$)). To sum up, the second-order four-factor model showed a slightly better fit to the data compared to the first-order four-factor model.

With regard to internal consistency, when removing item 24, the Cronbach's alphas were **α** = .89 [95% CI .87-.90] for the excessiveness subscale and **α** = .95 [95% CI .94-.97] for the total scale including mistrust. The Cronbach's alpha for the total scale removing also the mistrust factor was **α** = .96 [95% CI .95-.96]). It should be noted that the Cronbach's alphas of the two revised versions of the scale slightly improved compared to the alphas observed for the original scale.

Bivariate correlations

Results from the correlation analyses indicated a high association between the total score of CSS (original version) and the HAQ ($r = .71$, $p < .001$), and between the two revised versions of the CSS (CSS 1 and CSS 2) and the HAQ ($r = .72$, $p < .001$), thus demonstrating acceptable convergent validity (Table 3). Overall, the associations between the HAQ and CSS subscales (CSS 1) were substantially high, whereas a lower correlation was observed between the HAQ and mistrust of medical professional. The correlation analyses between the GPIUS2 and the total score of CSS ($r = .32$; $p < .001$ with original version and CSS2; $r = .33$; $p < .001$ with CSS1) showed divergent validity (e.g., Campbell & Fiske, 1959).

Test-retest

Results of the correlation analyses demonstrated that the Italian version of the original CSS has adequate test-retest reliability ($r = .75$, $p < .001$), as well as the revised CSS 1 ($r = .75$, $p < .001$) and the revised CSS 2 ($r = .73$, $p < .001$) (See APPENDIX A for a comprehensive table of the test-retest reliability results for each subscale).

Summary of results (Study 1)

The fit indices for the five- and four-factor models are all adequate and comparable, with the five-factor first-order model (revised CSS 1; removing item 24) showing the best fit. In the present study, item 24 had a very low loading on the excessiveness factor (.19) and was removed. The factor loading for the same item had also been found low in previous German (Barke et al., 2016) and English versions of the scale (Fergus, 2014; McElroy & Shelvin, 2014), with Fergus (2014) suggesting the possibility to remove it to improve the internal consistency of the scale. A possible reason why item 24 seem to be characterized by poor functioning item in general could be that it refers to the "quality" of websites ("trustworthy source") rather than to the "quantity" of searches, which represents the main content of the "excessiveness" dimension. Alternatively, the low factor loading of item 24 might be due to the specificity of the sample made of healthy young adults.

With regard to the factor structure, these results indicated that the mistrust factor weakly, though significantly, contribute to the overall construct of cyberchondria. However, in line with previous indications (e.g. Bajcar et al., 2019), the four-factor model showed a very good fit to the data.

Study 2 – Test of the Metacognitive Model of Cyberchondria

Following the support for the measurement of cyberchondria among Italian respondents, it is important to examine correlates of this experience in order to help inform a clinical model for potential future intervention. Therefore, extending the findings by Fergus and Spada (2018), a metacognitive model of cyberchondria was examined to provide additional support for a metacognitive conceptualization of cyberchondria.

To extend Fergus and Spada's (2018) findings, it is important to examine the possibility that relations between metacognitive beliefs about health-related thoughts and cyberchondria occur, at least partially, as a result of beliefs about rituals and stop signals. In other words, it is important to examine the proposed processes that help link metacognitive beliefs about health-related thoughts and greater engagement in repetitive, distressing Internet searches for health information. As reviewed, Fergus and Spada (2018) proposed that beliefs about rituals and stop signals link those variables. Nonetheless, such a possible pattern of interrelations among the respective study variables remains unexamined. To further extend Fergus and Spada's (2018) findings, and given the multidimensional nature of cyberchondria, the five dimensions of cyberchondria (as measured by the Italian revised version of the CSS) were used as separate dependent variables instead of an overall score, as was done in Fergus and Spada's (2018) study. Indeed, it was expected that the sets of (metacognitive) beliefs might play different roles in relation to the compulsive, cognitive, behavioral, relational, and negative aspects of cyberchondria. Elucidating these potential differential relations might be useful in tackling specific aspects of cyberchondria in people reporting greater difficulties in regulating their emotion, thoughts, or behavior.

Materials and method

Participants

A convenience sample of 882 adults participated in this study. Twelve participants were excluded as they reported a serious disease (such as, multiple sclerosis and cancer). Moreover, 153 participants were removed as they just started to complete the questionnaire but answered to less than the 20% of the questions. The final sample comprised 717 Italian participants (87% females, M_{age} 27.27 years, SD=5.67, range 19-77). The sample size provided sufficient statistical power for data analysis (Schreiber et al., 2006) and the final sample was used to test the theoretical model showed in figure 1. Approximately 18% of the sample reported a common health condition, such as lactose intolerance, acne, and stomachache. Respondents were mainly university students (49.9%) or workers (27.4%) (others were student workers (15.6%) or unemployed (7%)), and received at least a three year college degree (60%).

Procedure

The sample was recruited online by sending the link of a questionnaire to e-mail lists of the University of Padova and sharing the link in social network sites groups. The survey was accessible online from 16th January 2018 to 15th June 2018. Participants were asked to give their consent in the first page of the study website, which explained the purpose of the study and assured the anonymity of the responses. Participants were then directed to a second page containing demographic information and a series of self-report scales. The current research received formal approval by the local Ethics Committee for Psychological Research.

Measures

Cyberchondria Severity Scale (CSS). The revised Italian version of the CSS presented in Study 1 (CSS-1) was used to assess cyberchondria. It comprises 32 items and 5 dimensions. The Cronbach's alphas for the subscales were as follows: "compulsion" (**α** = .95 [95% CI .95-.96]), "distress" (**α** = .94 [95% CI .93-.95]), "excessiveness" (**α** = .85 [95% CI .84-.87]), "reassurance" (**α** = .84 [95% CI .82-.86]), and "mistrust of medical professional" (**α** = .82 [95% CI .80-.85]). The overall

Cronbach's alpha for the total scale was **α** = .95 [95% CI .95-.97]). These Cronbach's alphas suggested a good internal consistency of the scale and its dimensions.

Metacognitions Questionnaire-Health Anxiety (MCQ-HA). The MCQ-HA (Bailey & Wells, 2015) was used to assess three metacognitive beliefs related to health-related thinking: biased thinking (5 items; i.e., "Worrying about illness is likely to make it happen"), thought-illness fusion (5 items; i.e., "Thinking negatively can increase my chances of disease"), and thoughts are uncontrollable (4 items; "Dwelling on thoughts of illness is uncontrollable"). The whole scale consists of 14 items rated on a 4-point scale (ranging from (1) "strongly disagree" to (4) "strongly agree"). Items were translated from English to Italian by three different researchers and back-translated in English by a bilingual psychologist. The Cronbach's alphas for the three metacognitive beliefs were as follows: "biased thinking" (**α** = .74 [95% CI .70-.77]), "thought-illness fusion" (**α** = .85 [95% CI .83-.87]), "thoughts are uncontrollable" (**α** = .81 [95% CI .78-.83]).

Beliefs about Rituals Inventory (BARI). Following the method used in Fergus & Spada (2018), 7 items of the BARI (Fergus & Spada, 2018; McNicol & Wells, 2012) were used to assess the beliefs about rituals relevant to cyberchondria. Participants were asked to rate the extent to which they agree with each item (e.g., "I will never have peace of mind") following the introduction: "I need to complete online searches for health information, otherwise…" on a 4-point scale (ranging from (1) "strongly disagree" to (4) "strongly agree"). Items were translated from English to Italian by three different researchers and back-translated in English by a bilingual psychologist. The Cronbach's alpha for the scale was **α** = .93 [95% CI .92-.94]).

Stop Signals Questionnaire (SSQ). The adapted version (Fergus & Spada, 2018) of the SSQ (Myers, Fisher, & Wells, 2009) was used to assess 12 stop signals. Participants were asked to rate the importance of each stop signal (e.g., "I have an internal feeling that signals it is safe to stop") following the introduction: "An important signal of when I can stop searching online for health information is when…" on a 5-point scale (ranging from (1) "not at all important" to (5) "extremely

important"). Items were translated from English to Italian by three different researchers and back-translated in English by a bilingual psychologist. The Cronbach's alpha for the scale was **α** = .92 [95% CI .91-.92]).

Intolerance of Uncertainty Scale-Revised (IUS-R). The Italian version of the IUS-12 (Bottesi, Noventa, Freeston, & Ghisi, 2019) was used to assess the intolerance of uncertainty. It consists of 12 items (e.g., "Unforeseen events upset me greatly", "I must get away from all uncertain situation") rated on a 5-point scale (from (1) "not at all agree" to (4) "completely agree"). The Cronbach's alpha for the scale was **α** = .92 [95% CI .92-.96]).

Statistical Analysis

First, in order to explore the associations between the variables of the study correlation analyses were conducted. Then, the pattern of relationships specified by our theoretical model (Figure 1) was tested through path analysis, using Mplus 8.2 (Muthén & Muthén, 1998-2017). A single observed score for each construct included in the model was used. The Robust Maximum Likelihood method estimator was used and bias-corrected bootstrap confidence intervals with 5000 bootstrapped iterations were used for calculating indirect effects, which were considered significant if their 95% confidence interval did not include zero. To evaluate the goodness of fit of the model we considered the R^2 of each endogenous variable. In the tested model, the five subscales of the CSS were the outcome variables. The three metacognitive beliefs were the independent variables, with indirect effects modeled through beliefs about rituals and stop signals, respectively. Age, gender, having reported an health condition, and intolerance of uncertainty were included as control variables on the five outcomes (Figure 1).

Results

Table 4 shows the means, standard deviations, and bivariate correlations between the variables included in the study.

A first version of the theoretical model was tested including all the relations hypothesized in the theoretical model. However, the path coefficient between several variables did not reach statistical significance and showed very small sizes (results of this model are presented as Supplementary Material). Therefore, these relations were removed step-by-step and the model was tested again (e.g., Marino et al., 2019).

Results of the final path analysis indicated that all path coefficients were significant at the $p <$ .05 level. The squared multiple correlations for the outcome variables indicate that the model accounted for considerable amount of variance for the outcomes (i.e., 58% of the variance for distress, 47% of the variance for compulsion, 44% of the variance for excessiveness, 28% of the variance for reassurance, and lower variance – 9% of mistrust of medical professional). Among the three metacognitive beliefs (Figure 2), "thoughts are uncontrollable" showed the strongest direct links with four out of five outcomes. Biased thinking was the sole metacognitive beliefs directly linked to mistrust of GP, whereas thought-illness fusion was not directly associated with the outcomes. In regards to the intermediary variables, the model accounted for 41% and 12% of the variance for beliefs about rituals and stop signals respectively. Along with the direct paths, as shown in Table 5, most of the indirect effects were statistically significant. Specifically, the strongest indirect links were found between "thoughts are uncontrollable" and all the five-cyberchondria dimensions via beliefs about rituals.

Discussion

The aim of the first study was to present the factor structure validation of the Italian version of the CSS. It was found that both the five- and four-factor higher order structures were tenable. Study 2 also contributes to advance research on cyberchondria and its metacognitive model (Fergus & Spada, 2017; 2018), suggesting that the metacognitive approach may be usefully applied to the cyberchondria context. Indeed, as the literature considers cyberchondria as an emerging potentially dangerous phenomenon for public health (e.g. Starcevic, Baggio, Berle, Khazaal, & Viswasam, 2019), the current results shed light on potential mechanisms leading to and maintaining cyberchondria.

Two consistent patterns of Study 2 results were links between metacognitive beliefs related to biased thinking and thoughts being uncontrollable with the behavioral (compulsion and excessiveness), emotional (distress), and cognitive (reassurance) dimensions of cyberchondria via beliefs about rituals. The effects in relation to biased thinking were smaller in magnitude relative to the effects in relation to thoughts being uncontrollable. Nonetheless, the pattern of relations may suggest that thinking health-related worry has potential consequences or is uncontrollable motivates attempts to cope with these worries. To the degree which individuals hold positive beliefs about Internet searches to cope with health-related distress, they may be more likely to engage in such searching behavior. However, believing that searching online is helpful in controlling thinking or in feeling better, on the contrary, relates to greater frequency of searches and consequent impairment in life, greater health anxiety due to online searches, and more need to seek out for professionals to be reassured. Interestingly, this path is the only one significant also for mistrust. That is, the conflict arising when results of the online searches and professional advices do not align could be strengthened by the belief about the usefulness of online searches themselves. From this view, holding metacognitive beliefs about health-related worry and believing Internet searches as relevant for coping with health-related distress seem important in relation to negative effects of online searches.

Contrary to Fergus and Spada's (2018) model, stop signals did not emerge as robust of an intermediary variable relative to beliefs about rituals within the path analysis. Following from Study 2 results, it appears that beliefs about the benefits of engaging in Internet searches for health information could potentially be more important for understanding cyberchondria than beliefs surrounding elevated requirements for stopping such searches. Nonetheless, stop signals still accounted for unique variance in several cyberchondria dimensions, particularly surrounding the repetitive quality of the searching behavior and engagement in additional reassurance behavior. As such, stop signals may have incremental value in understanding specific aspects of cyberchondria.

Despite metacognitive beliefs surrounding biased thinking and thoughts being uncontrollable consistently emerging as related to the cyberchondria dimensions, modeled pathways between metacognitive beliefs that thoughts can cause illness (i.e., thought-illness fusion beliefs) and the cyberchondria dimensions were not needed within the path analysis. This pattern of findings shares consistency with prior results indicating that thought-illness fusion beliefs do not relate to cyberchondria when statistically accounting for other metacognitive beliefs (Fergus & Spada, 2017, 2018). Interestingly, our findings are overall consistent also with those reported in the literature about health anxiety. For example, Bailey and Wells (2016) found that metacognitive beliefs explained 49% of the variance in health anxiety symptoms after controlling for dysfunctional beliefs and neuroticism in a non-clinical sample; beliefs that thoughts are uncontrollable were the strongest predictor. Melli et al. (2018) observed that beliefs that thoughts are uncontrollable were predictive of health anxiety symptoms over and above depression, general anxiety, anxiety sensitivity, and health-related dysfunctional beliefs in individuals reporting having received a diagnosis of health anxiety or illness anxiety disorder. On the contrary, beliefs about biased thinking and beliefs that thoughts cause illness did not emerge as significant predictors of health anxiety (Melli et al., 2018). As a whole, these findings support the notion that uncontrollability of thinking might represent a crucial metacognitive belief spanning different clinical phenotypes, since it promotes threatening interpretations of mental events and, consequently, it fosters anxiety (Bailey & Wells, 2016).

Among the cyberchondria dimensions, the modeled pathways accounted for nearly 30-60% in the majority of cyberchondria dimensions. Alternatively, the modeled pathways accounted for only about 10% of variance in the mistrust dimension. Researchers have questioned whether the mistrust dimension belongs to the same overarching construct as the other assessed dimensions (Fergus, 2014), with more recent conceptualizations removing the mistrust dimension from consideration (McElroy et al., 2019). As such, the examined study variables accounted for a substantial amount of variance in the core four cyberchondria dimensions.

The present two studies have several limitations that need highlighting. Study 1 does not provide any cut-off for distinguishing problematic from non-problematic users and the scales used for testing construct validity were not administered in counterbalanced fashion to control for order and sequence effects due to technical limitations of the online platform employed to collect data. Moreover, we only tested the factorial structure of the Italian version of the CSS, its internal consistency, convergent and divergent validity, and test–retest stability. Further research should examine other psychometric properties of this scale and test the cross-gender, age and socioeconomic status invariance of the factorial structure. Finally, the samples in both Study 1 and Study 2 are not necessarily representative of the general Italian population because the majority were females, quite young and highly educated. With regard to gender, as women were overrepresented in the sample, it might have influenced the latent structure of the CSS and the association between cyberchondria and health anxiety in which women are usually higher than men (MacSwain et al., 2009). Moreover, well-educated young adults may be more likely to mistrust health care practitioners, thus psychometric outcomes observed in the present sample may not be replicated in samples of women and men with lower levels of education. Furthermore, the lack of a clinical sample should be acknowledged because it is likely that the psychometric properties of the CSS (including factor loading and the latent structure) will differ substantially in clinically relevant samples given the presence of an increased range of symptoms relative to nonclinical samples (e.g., heightened generalized distress and comorbidity). Finally, research is needed to confirm the validity of the 15-item CSS short form as proposed by Barke and colleagues (2016) and the 12-item CSS short version as proposed by McElroy and colleagues (2019) in order to provide a briefer tool to assess this phenomenon. Additionally, it is important to further investigate the predictive validity of the scale, for example, by exploring the relationships between the scale's scores and different patterns of psychological distress (Fergus, 2014; Starcevic et al., 2019).

With regard to Study 2, the cross-sectional design does not allow to draw causal inference even though the tested paths were modelled in line with a metacognitive model, which only gives

suggestions on the direction of the association (e.g., Bullock, Harlow, & Mulaik, 1994). Future experimental research is needed to examine the possible mediating effect of beliefs about rituals and stop signals on cyberchondria and underlying dimensions. As described above, an important additional study limitation is that the sample was a non-clinical convenience one made of self-selected participants online like several other studies in the field (e.g., Bajcar et al., 2016; Barke et al., 2016). Therefore, future studies should replicate the findings using clinical randomly selected samples.

Moreover, although the measures used in this study have solid psychometric properties, they are all self-report. Moreover, the Italian versions of three scales (i.e., MCQ-HA, BARI, SSQ) have not been published yet.

These limitations withstanding, the present results have some important implications. First, a preliminary validation of the Italian version of the CSS is provided: its use in future national studies in the field is highly encouraged. Moreover, Italian professionals working in diverse psychological settings (i.e., clinical, prevention) and willing to assess cyberchondria can now use a relatively short and reliable validated measure. Second, findings from Study 2 provide support for the conceptualization of cyberchondria in the metacognitive framework. From a clinical standpoint, the present results might represent a starting point to design and then implement both prevention and treatment interventions for cyberchondria specifically targeting metacognitive beliefs – beliefs about the uncontrollability of thinking in particular. The present results further suggest that beliefs about the benefits of engaging in Internet searches for health information could potentially be useful in linking metacognitive beliefs to repetitive, distress-evoking Internet searches for health information. Further understanding interrelations between metacognitive beliefs, beliefs about Internet searches, and cyberchondria could ultimately support and help develop metacognitive treatment strategies in the treatment of cyberchondria.

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Table 1. Standardized factor loadings for the Cyberchondria Severity Scale (original five-factor model).

Brief description of items	M(SD)	Skewness (SE)	Kurtosis (SE)	Compulsion	Distress	Excessiveness	Reassurance	Mistrust
1. Researching symptoms interrupts online leisure activities	1.62 (.95)	1.60 (.13)	2.11 (.26)	.930				
2. Researching symptoms interrupts social network	1.71 (1)	1.42 (.13)	1.46 (.26)	.938				
3. Researching symptoms interrupts offline work activities	1.58 (.91)	1.61 (.13)	2.06 (.26)	.944				
4. Researching symptoms interrupts reading articles online	1.55 (.86)	1.58 (.13)	2.04 (.26)	.923				
5. Researching symptoms interrupts online communication	1.44 (.83)	2.10 (.13)	4.37 (.26)	.876				
6. Researching symptoms interrupts work	1.46 (.860)	2.04 (.13)	3.80 (.26)	.963				
7. Researching symptoms interrupts offline social activities	1.29 (.69)	2.95 (.13)	9.70 (.26)	.876				
8. Researching symptoms interrupts other research	1.55 (.89)	1.73 (.13)	2.61 (.26)	.958				
9. Trouble relaxing after researching symptoms	1.96 (1.02)	.90 (.13)	.18 (.26)		.920			
10. Hard to stop worrying about symptoms researched online	1.88 (1,04)	1.01 (.13)	.26 (.26)		.934			
11. Trouble getting to sleep after researching symptoms	1.65 (.95)	1.46 (.13)	1.53 (.26)		.899			
12. Feel more distressed after researching symptoms	2.06 (1.10)	.80 (.13)	-.17 (.26)		.875			
13. Panic when read that symptom is found in serious condition	1.92 (1.12)	1.13 (.13)	.49 (.26)		.812			
14. Think fine until read about serious condition	1.53 (.86)	1.58 (.13)	1.84 (.26)		.768			
15. More easily irritated after researching symptoms	1.65 (.97)	1.46 (.13)	1.30 (.26)		.799			
16. Lose appetite after researching symptoms	1.30 (.72)	2.72 (.13)	7.69 (.26)		.865			
17. Read different pages about same condition	2.53 (1.27)	.36 (.13)	-.93 (.26)			.826		
18. Read same pages about condition more than one occasion	1.80 (1.02)	1.30 (.13)	1.14 (.26)			.871		
19. Enter same symptoms into search more than one occasion	1.53 (.93)	1.93 (.13)	3.30 (.26)			.811		
20. Ranking of search results reflects how common illness is	1.70 (1.02)	1,33 (.13)	.82 (.26)			.759		
21. Visit trustworthy websites and user-driven forums	2.25 (1.21)	.60 (.13)	-.68 (.26)			.846		
22. Visit forums where individuals discuss symptoms	1.97 (1.13)	.97 (.13)	.02 (.26)			.841		
23. If notice an unexplained bodily sensation search on Internet	2.02 (1.08)	.82 (.13)	-.20 (.26)			.751		
24. Visit trustworthy sources when researching symptoms	2.54 (1.22)	.33 (.13)	-.91 (.26)			.189		

25. Discuss online medical findings with GP	1.54 (.93)	1.90 (.13)	3.18 (.26)	.747	
26. Discuss online info with GP reassures me	1.85 (1.20)	1.31 (.13)	.65 (.26)	.668	
27. Researching symptoms leads to consult with specialists	1,53 (.85)	1.55 (.13)	1.71 (.26)	.897	
28. Researching symptoms leads me to consult with GP	1.79 (1.04)	1.26 (.13)	.82 (.26)	.853	
29. Would not have gone to the doctor if not read online	1.38 (.70)	1.79 (.13)	2.43 (.26)	.850	
30. Suggest to GP need procedure that read about online	1.42 (.85)	2.06 (.13)	3.46 (.26)	.846	
31. Trust GP diagnosis over online self-diagnosis	1.57 (.91)	1.91 (.13)	3.71 (.26)		.931
32. Take opinion of GP more seriously than online research	1.56 (.92)	1.90 (.13)	3.44 (.26)		.948
33. GP dismisses online medical research, worrying about it	1.95 (1.11)	1.24 (.13)	.95 (.26)		.795

Notes: N= 343; Range: 1-5; all significant at $p \leq .001$.

Table 2. Fit indices for measurement models.

Model	χ^2 (Df)	CFI	TLI	RMSEA	90% CI
Original CSS					
First-order model					
One-factor	4373.63(495)*	.842	.831	.151	.147-.155
Five-factor	1078.836(485)*	.976	.974	.060	.055-.065
Second-order model					
Higher-order model	1031.891(490)*	.978	.976	.057	.052-.062
Revised CSS 1 (item 24 removed)					
First-order model					
One-factor	4299.581(464)*	.841	.830	.155	.151-.160
Five-factor	994.310(454)*	.978	.976	.059	.054-.064
Second-order model					
Higher-order model	948.713(459)*	.980	.978	.056	.051-.061
Revised CSS 2 (item 24 and mistrust factor removed)					
First-order model					
One-factor	2372.346(377)*	.912	.906	.124	.119-.129
Four-factor	867.025(371)*	.978	.976	.062	.057-.068

Second-order model					
Higher-order model	844.713(373)*	.979	.977	.061	.055-.066

Notes: N= 343; *p<.001.

Table 3. Descriptive statistics and bivariate correlations between CSS, HAQ, age, and gender (study 1).

	M(SD)	1	2	3	4	5	6	7	8	9	10	11
1. CSS-compulsion	1.52(.77)	1										
2. CSS-distress	1.74(.80)	.653**	1									
3. CSS-excessiveness	2.04(.78)	.722**	.695**									
4. CSS-reassurance	1.59(.71)	.461**	.499**	.517**	1							
5. CSS-mistrust	1.70(.86)	.124*	.109*	.099	.064	1						
6. CSS-total [a]	1.73(.60)	.860**	.862**	.884**	.688**	.249**	1					
7. Health Anxiety	1.78(.49)	.612**	.723**	.593**	.409**	.113*	.709**	1				
8. CSS 1-excessiveness [b]	1.97(.85)	.738**	.715**	.981**	.495**	.138*	.889**	.626**	1			
9. CSS 1-total [c]	1.71(.61)	.862**	.866**	.872**	.680**	.261**	.998**	.717**	.889**	1		
10. CSS 2-total	1.71(.66)	.869**	.875**	.882**	.690**	.133*	.991**	.721**	.894**	.991**	1	
11. Age	25.76(5.32)	-.016	.031	.040	.134*	.148**	.066	.008	.038	.065	.047	1
12. Gender	-	.017	.074	.054	-.059	.003	.034	.112*	.063	.036	.036	-.039

Notes: N=343; *p<.05; **p<.01; CSS=Cyberchondria Severity Scale; [a] = CSS original version, 33 items; [b] = excessiveness dimension of the Revised CSS 1, item 24 removed; [c] = Revised CSS 2, item 24 removed and mistrust factor removed.

Table 4. Descriptive statistics and bivariate correlations between the variables of interest (study 2).

	M(SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CSS 1-compulsion	1.55(.79)	1													
2. CSS 1-distress	1.72(.85)	.684**	1												
3. CSS 1-excessiveness	2.04(.89)	.644**	.686**	1											
4. CSS 1-reassurance	1.63(.75)	.451**	.533**	.544**	1										
5. CSS 1-mistrust	1.64(.80)	.281*	.247**	.234**	.162**	1									
6. CSS 1-total [a]	1.72(.65)	.849**	.882**	.862**	.707**	.386**	1								
7. Biased Thinking	1.39(.43)	.444**	.518**	.402**	.349**	.206**	.523**	1							
8. Uncontrollable Thoughts	1.44(.62)	.529**	.623**	.499**	.414**	.204**	.626**	.543**	1						
9. Thought-illness Fusion	1.82(.73)	.294**	.285**	.268**	.255**	.092*	.328**	.320**	.380**	1					
10. Beliefs about Rituals	1.33(.54)	.662**	.704**	.618**	.440**	.256**	.740**	.468**	.619**	.300**	1				
11. Stop Signals	2.40(.94)	.268**	.326**	.340**	.292**	.032	.356**	.284**	.298**	.244**	.319**	1			
12. Intolerance of Uncertainty	2.34(.86)	.377**	.409**	.351**	.229**	.056	.409**	.415**	.460**	.206**	.391**	.302**	1		
13. Health Problem	-	.049	.093*	.123**	.183**	.034	.125**	.099**	.167**	.042	.042	.059	.056	1	
14. Age	27.27(5.66)	-.069	-.083*	-.076*	.022	.018	-.064	-.089*	-.124**	-.042	-.116**	-.133**	.183**	.057	1
15. Gender	-	-.018	.000	.034	-.021	.000	.000	-.101**	-.078*	-.001	-.047	-.053	.001	-.005	.052

Note: N=343; *$p<.05$; **$p<.01$; CSS=Cyberchondria Severity Scale; [a] = Revised CSS 1, item 24 removed.

Table 5. Standardized indirect effects of the independent (metacognitive beliefs) on the five outcomes (cyberchondria dimensions) via the mediators (beliefs about rituals and stop signals).

Independent	Mediator	Outcome													
		Compulsion			Distress			Excessiveness			Reassurance			Mistrust of GP		
		Est.	95% CI		Est.	95% CI		Est.	95% CI		Est.	95% CI		Est.	95% CI	
Biased Thinking	Rituals	.089	.054	.125	.083	.050	.117	.082	.048	.115	.046	.024	.069	.038	.016	.060
Biased Thinking	Stop Signals	.003	-.006	.011	.009	.000	.019	.019	.005	.032	.021	.005	.036	-.009	-.022	.004
Uncontrollable Thoughts	Rituals	.251	.204	.298	.234	.192	.277	.229	.183	.275	.130	.086	.174	.107	.059	.156
Uncontrollable Thoughts	Stop Signals	.003	-.007	.012	.010	.000	.020	.020	.006	.035	.022	.006	.038	-.010	-.023	.004
Thought-illness Fusion	Rituals	.026	-.005	.057	.025	-.004	.053	.024	-.004	.052	.014	-.003	.030	.011	-.003	.025
Thought-illness Fusion	Stop signals	.002	-.006	.010	.008	.000	.017	.016	.004	.029	.018	.005	.032	-.008	-.019	.003

Note: 95% CI = bias-corrected bootstrapped confidence interval

APPENDIX A

Test-retest reliability results for each subscale

	r
CSS total	.748**
CSS -compulsion	.760**
CSS -distress	.636**
CSS -excessiveness	.652**
CSS -reassurance	.536**
CSS -mistrust	.438*
CSS 1-total [a]	.722**
CSS 1-excessiveness [a]	.754**
CSS 2-total [b]	.727**

Note: N=112; *p<.05; **p<.01; CSS=Cyberchondria Severity Scale; [a] = Revised CSS 1, item 24 removed; [b] = Revised CSS 2, item 24 and mistrust factor removed.

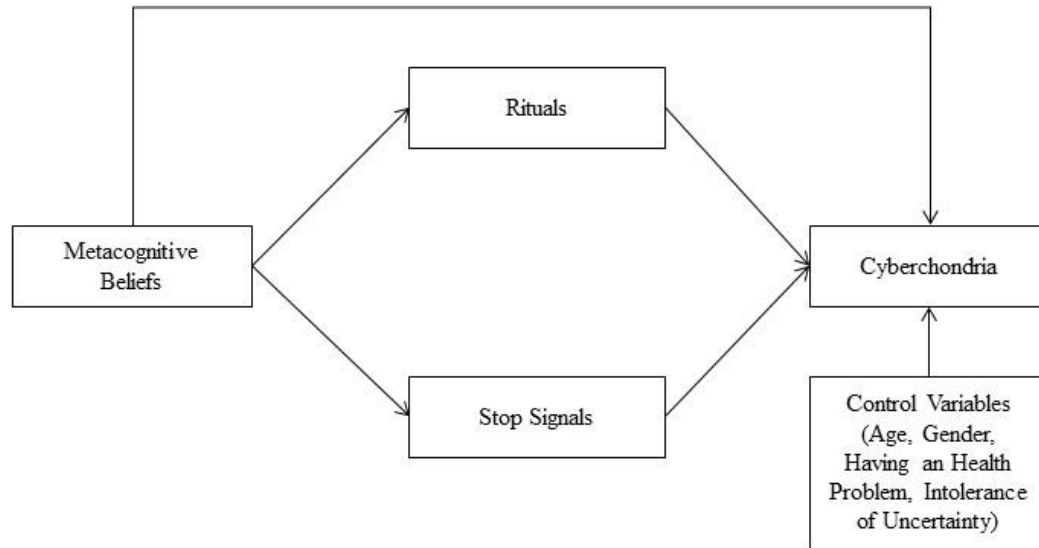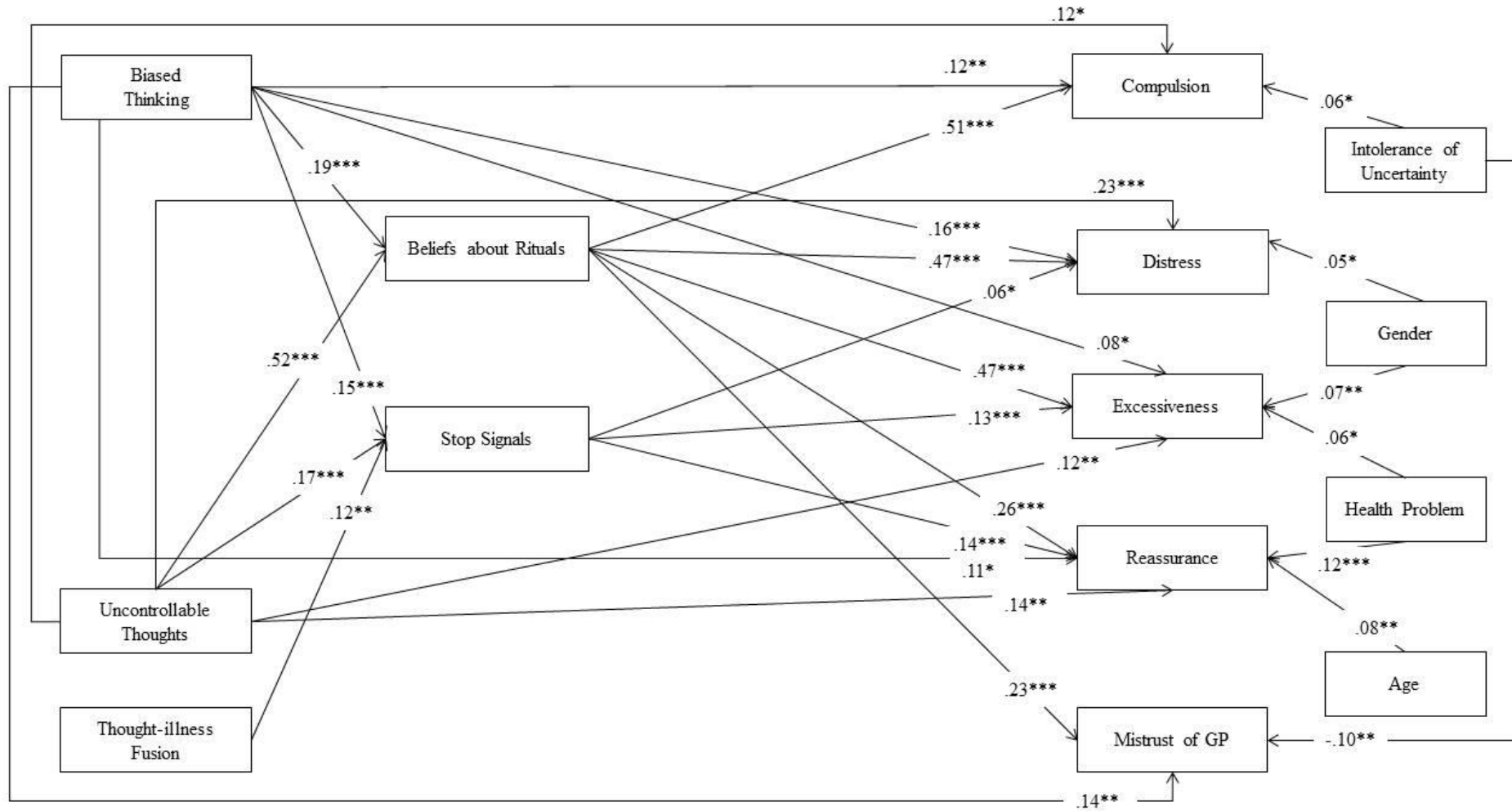Figure 1. Proposed theoretical model predicting the five dimensions of cyberchondria.

Figure 2. Final model of the inter-relationships between the study variables.

Notes: N= 717; * *p* < .01; ** *p* < .001; *** *p* < .001.

Supplementary Material

Path analysis – Full model - STANDARDIZED MODEL RESULTS

STDYX Standardization: Two-Tailed (A5= having an health problem)

	Estimate	S.E.	Est./S.E.	P-Value
CYBER_CM ON				
MCQ_C	0.050	0.030	1.688	0.091
MCQ_B	0.103	0.034	3.036	0.002
MCQ_U	0.113	0.039	2.886	0.004
BARI	0.500	0.033	14.973	0.000
SSQ	0.017	0.030	0.565	0.572
ETA	0.030	0.028	1.083	0.279
GENDER	0.024	0.027	0.872	0.383
INTOLERAN	0.078	0.032	2.435	0.015
A5	-0.009	0.028	-0.339	0.734
CYBER_DS ON				
MCQ_C	-0.012	0.027	-0.455	0.649
MCQ_B	0.152	0.030	5.003	0.000

MCQ_U	0.221	0.035	6.350	0.000
BARI	0.467	0.030	15.335	0.000
SSQ	0.062	0.027	2.341	0.019
ETA	0.025	0.025	0.993	0.321
GENDER	0.057	0.024	2.338	0.019
INTOLLERAN	0.049	0.029	1.714	0.087
A5	0.014	0.025	0.579	0.563

CYBER_EX ON

MCQ_C	0.026	0.031	0.830	0.406
MCQ_B	0.068	0.035	1.942	0.052
MCQ_U	0.105	0.041	2.595	0.009
BARI	0.456	0.035	13.022	0.000
SSQ	0.123	0.031	4.029	0.000
ETA	0.014	0.029	0.504	0.614
GENDER	0.077	0.028	2.715	0.007
INTOLLERAN	0.053	0.033	1.576	0.115
A5	0.068	0.029	2.395	0.017

CYBER_RE ON

MCQ_C	0.063	0.035	1.812	0.070
MCQ_B	0.101	0.040	2.550	0.011
MCQ_U	0.133	0.046	2.923	0.003
BARI	0.260	0.041	6.342	0.000
SSQ	0.136	0.034	3.946	0.000
ETA	0.086	0.032	2.661	0.008
GENDER	0.016	0.032	0.493	0.622
INTOLLERAN	-0.022	0.037	-0.578	0.563
A5	0.125	0.032	3.915	0.000

CYBER_MS ON

MCQ_C	-0.004	0.039	-0.111	0.912
MCQ_B	0.129	0.045	2.881	0.004
MCQ_U	0.065	0.052	1.254	0.210
BARI	0.214	0.047	4.593	0.000
SSQ	-0.059	0.039	-1.509	0.131

```
ETA            0.037      0.037      1.008      0.313

  GENDER          0.023      0.036      0.653      0.514

  INTOLLERAN     -0.086      0.042     -2.038      0.042

  A5             0.008      0.036      0.225      0.822


BARI    ON

  MCQ_C          0.053      0.031      1.681      0.093

  MCQ_B          0.179      0.034      5.218      0.000

  MCQ_U          0.502      0.032     15.467      0.000


SSQ     ON

  MCQ_C          0.133      0.038      3.520      0.000

  MCQ_B          0.152      0.042      3.641      0.000

  MCQ_U          0.165      0.043      3.852      0.000


BARI    WITH

  SSQ            0.148      0.037      4.056      0.000
```

CYBER_DS WITH

    CYBER_CM   0.347   0.033   10.552   0.000

CYBER_EX WITH

    CYBER_CM   0.362   0.032   11.169   0.000

    CYBER_DS   0.391   0.032   12.366   0.000

CYBER_RE WITH

    CYBER_CM   0.189   0.036   5.242   0.000

    CYBER_DS   0.282   0.034   8.212   0.000

    CYBER_EX   0.331   0.033   9.962   0.000

CYBER_MS WITH

    CYBER_CM   0.146   0.037   3.982   0.000

    CYBER_DS   0.076   0.037   2.058   0.040

    CYBER_EX   0.097   0.037   2.631   0.009

    CYBER_RE   0.040   0.037   1.081   0.280

Means

IPOCONDRIA	3.283	0.094	34.778	0.000
SOMATIC	4.461	0.124	36.098	0.000

Intercepts

CYBER_CM	-0.493	0.238	-2.074	0.038
CYBER_DS	-0.812	0.211	-3.849	0.000
CYBER_EX	-0.327	0.248	-1.318	0.187
CYBER_RE	-0.086	0.281	-0.308	0.758
CYBER_MS	1.043	0.324	3.222	0.001
BARI	0.543	0.115	4.717	0.000
SSQ	1.355	0.149	9.106	0.000

Residual Variances

CYBER_CM	0.522	0.027	19.417	0.000
CYBER_DS	0.420	0.024	17.588	0.000
CYBER_EX	0.562	0.028	20.232	0.000
CYBER_RE	0.712	0.029	24.661	0.000

CYBER_MS	0.910	0.021	44.235	0.000
BARI	0.590	0.028	20.901	0.000
SSQ	0.875	0.023	37.896	0.000

R-SQUARE

Observed			Two-Tailed	
Variable	Estimate	S.E.	Est./S.E.	P-Value
CYBER_CM	0.478	0.027	17.762	0.000
CYBER_DS	0.580	0.024	24.289	0.000
CYBER_EX	0.438	0.028	15.764	0.000
CYBER_RE	0.288	0.029	9.961	0.000
CYBER_MS	0.090	0.021	4.360	0.000
BARI	0.410	0.028	14.544	0.000
SSQ	0.125	0.023	5.405	0.000