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Italian validation of the Hypersexual Behavior Inventory (HBI): psychometric characteristics of a self-report tool evaluating a psychopathological facet of sexual behavior

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SUMMARY

Introduction

Hypersexuality is characterized by excess of sexual activities, obsession of sex and related consequences. On the other hand, the assessment of problematic sexuality includes several psychometric tools to screen hypersexual behavior. Hypersexual Behavior Inventory is one of these, although its Italian version is not current available.

Objectives

Therefore, we aim to validate the Italian version of the Hypersexual Behavior Inventory (HBI) in a sample of Italian people.

Methods

A study population composed by a convenience sample of 1000 subjects (females: 71.1%) aged 18-60 was recruited from an online platform. Sociodemographic information was collected and a psychometric protocol composed by the Italian version of Hypersexual Behavior Inventory (HBI) to assess hypersexuality, Patient Health Questionnaire (PHQ-9) for depression, General Anxiety Disorder (GAD-7) for anxiety and Relationship Questionnaire for Attachment Styles (RQ) was administered.

Results

The analysis of internal consistency of HBI showed Cronbach's α coefficients in overall and subscales ranged from 0.81 to 0.92. In the confirmatory analysis fit indices were: c^2/df = 5.951, SRMR = .046, CFI =.92, RMSEA =.070, suggesting a good fit. Positive correlations were found among the three subscales coping factor, control factor and consequences factor, and all these subscales positively correlated with the total score of HBI (Pearson r coefficients ranged from .526 to .883; p-values < .0001). Discriminant validity revealed significant Pearson r correlations ranged from -.086 to .407.

Conclusions

Hypersexuality represents the tip of the iceberg of a more severe condition of psychological suffering. For this reason, the evaluation of hypersexual behavior is fundamental for subjects with a dysfunctional sexuality, and HBI offers a satisfactory evaluation of this phenomenon in all its facets. Moreover, on the basis of psychometric characteristics, HBI can be considered an efficient tool to accurately detect and circumscribe the hypersexual behavior in vulnerable people suffering from psychological and sexological issues, also among Italian population.

Key words: hypersexuality, psychometry, Hypersexual Behavior Inventory (HBI), Italian version

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Conflict of interest
The Authors declare no conflict of interest

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Introduction

The excess of sexual activities, the obsession of sex and the related consequences, is called hypersexuality. This condition includes the excess of compulsive masturbation, pornography, cybersex or telephone sex use, sexual activity with consenting adults, brothel/prostitution and strip/privé club frequentation [1].

In this regards, the hypersexual/addicted subject attempts to antagonize depressive and anxiety states, dysphoric mood or stressful life events through sexual activities, although in a dysregulated way also derived by attachment, relational and emotional difficulties [2-4].

Hence, hypersexuality can be also considered a defensive behavior against other psychological suffering and general psychopathological symptomatology, through unaware behavioral responses [5,6]. In this regard, the recent scientific debate has been on whether to include hypersexuality within the last version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), with some proposals based on diagnostic criteria [7]. However, to date the psychiatric nosography does not consider hypersexuality a mental disorder *per se* [7,8]. On the contrary, the World Health Organization has recently proposed to include the hypersexuality within the last version of the International Classification of Diseases (ICD-11) as a disorder of sexual compulsive behavior (CSBD) [9]. Notably, the CSBD is classified among impulse control disorders together with pathological gambling, intermittent explosive disorder, kleptomania, and pyromania [10,11].

The DSM-5 Work Group on Sexual and Gender Identity Disorders proposed possible detailed criteria for hypersexuality, with important considerations about the differential diagnosis [12,13]. The proposal of DMS-5 can be regrouped as follow: (a) an excessive or disproportionate amount of time consumed by sexual thoughts, urges, and behaviors; (b) using sex in response to unpleasant affective states or to cope with stress; (c) multiple unsuccessful attempts to reduce or control sexual thoughts, fantasies, and behaviors; (d) continued preoccupation with and pursuit of sex despite negative consequences to self or others; and (e) volitional impairment [12,14,15].

On the basis of these criteria, the same authors have also developed a screening tool for hypersexuality named Hypersexual Disorder Screening Inventory (HDSI) composed by seven items along a five-point Likert scale, according to the proposed criteria for the classification of hypersexuality [13].

On the other hand, other questionnaires and psychometric tools were developed in order to evaluate hypersexual behavior, sexual addiction and sexual compulsivity [16]. One of these is the Hypersexual Behavior Inventory (HBI) ideated by Reid et al., an interesting psychometric tool firstly validated on an outpatient sample of men [17]. Also, this tool is based on DSM-5 proposal for hypersexual disorder and its criteria, with also a possible but not definitive cut-off score [18,19]. HBI is a self-report psychometric test composed by 19 items along a five-points Likert scale. Its items, in the original version, by Reid were developed according to three main characteristics of hypersexuality: the deficit to control sexual urges (fantasies or activities); use of sex to cope with personal stressful states, (b) using sex to cope with unpleasant affective experiences or in response to stress; and (c) negative consequences related to sexual behavior [17].

The validation process was made on a sample of 324 male American patients and the exploratory analysis factor confirmed three main factors named by the authors Control, Coping, and Consequences.

Moreover, the reliability evaluated through the Cronbach's alpha coefficient revealed high internal reliability for the overall scale (α = .95) and subscales (Control α = .94, Coping α = .90, and Consequences α = .87) [15]. For these reasons, HBI is a suitable tool to assess hypersexuality, and it is largely used in both research field and clinical practice, for the assessment of problematic sexuality and hypersexual behavior [20,21]. Moreover, another important study investigated and demonstrated the applicability of HBI among non-clinical subjects and into the general population, revealing excellent psychometric proprieties in large non-pathological sample [19].

However, at our knowledge the existing versions are the original ones in the English language, while only recently the Spanish and German language versions have been validated [17,22,23]. An Italian version of HBI is still not available, and we hypothesize that an Italian adaptation of HBI could be extremely useful to confirm the same psychometric properties of the original version and to properly assess hypersexual behaviors in an Italian context.

Aim

Based on the above considerations, our aim is to validate the HBI in the Italian language and to administer it in a sample of Italian people.

Methods

Sample recruitment

A study population composed by a convenience sample of 1000 subjects aged 18-60 was recruited from an online platform through a snowball recruitment in the main social media. The study protocol was approved by the ethics committee of Department of Dynamic and Clinical Psychology, Sapienza University of Rome, for

investigations involving human subjects, in line with the Declaration of Helsinki. Moreover, all subjects signed an informed consent regarding the handling of personal data.

Assessment

We administered a protocol composed of a sociodemographic questionnaire including information as age, gender, partnership status and education, the Italian translation of the HBI to measure the hypersexual behavior, the main outcome measure of this study.
Moreover, to test discriminant validity referred to hypersexuality, we also administered the Patient Health Questionnaire (PHQ-9) and the Generalized Anxiety Disorder (GAD-7) to test depression and anxiety, respectively, and the Relationship Questionnaire to assess attachment and relational styles.

Hypersexual Behavior Inventory (HBI)

HBI, as previously mentioned, contains 19 items with a 5-point Likert scale (1 = Never; 5 = Very often). HBI calculates a total score about the tendency towards hypersexual behavior (higher scores indicate a major hypersexuality) and three subscales assessing three factors or domains linked to hypersexual behavior: *Coping* (Items 1, 3, 6, 8, 13, 16, and 18), *Control* (Items 2, 4, 7, 10, 11, 12, 15, and 17), *Consequences* (Items 5, 9, 14, and 19). Possible scores range from 19 to 95. Examples of items or sentences of HBI are following: "I use sex to forget about the worries of daily life"; "Even though I promised myself I would not repeat a sexual behavior, I find myself returning to it over and over again"; "I sacrifice things I really want in life in order to be sexual" [17].

HBI translation

We put the original version of the HBI through a forward and backward translation procedure, having developed a consensus of the authors who developed the scale. The translation and adaptation were carried out from English to Italian by two expert bilingual translators and a team of psychometrists, clinical psychologists and sexologists evaluated each item, according to an accurate understanding of the Italian people.

Patient Health Questionnaire (PHQ-9)

PHQ-9 is a psychometric tool to evaluate depression. It is composed by nine items along a four Likert scale, "0" (not at all) to "3" (nearly every day). It is one of the most used, well validated tools in mental health and can be a powerful tool to assist clinicians with diagnosing depression [24,25].

Generalized Anxiety Disorder 7-item (GAD-7)

GAD-7 is an easy to perform initial screening tool for generalized anxiety disorder. It is composed by seven items along a four Likert scale from 0 (Not at all) to 3 (Nearly every day). GAD-7 is a very useful tool anxiety symptoms and generalized anxiety and it is very used in clinical field for a primary screening [26].

Relationship Questionnaire (RQ)

RQ is a single item measure made up of four short paragraphs specifically evaluating the relational style according the model of Self and the Other. Each item is referred to a prototypical attachment style (secure, preoccupied, fearful and dismissing) along a 7-point Likert scale, although also a categorical choice is possible. We used the continuous measure of RQ [27,28].

Statistical analysis

The *Statistical Package for Social Science* (SPSS) version 26 for Windows and AMOS were used to run the Confirmatory Factor Analysis (CFA) and the correlation between the variables. Continuous variables were represented statistically as mean and standard deviations. Categorical variables were represented as absolute and percentage frequencies. Internal consistency was assessed by the overall Cronbach α coefficient following the 19 items of the HBI, and also for the three subscales: $\alpha > .90$ are considered excellent indicators, α comprised between .80 and .90 are good indicators, α included between .70 and .80 are evaluated as suitable, coefficient included between .70 and .80 are estimated as sufficient, and $\alpha < .60$ are insufficient indicators [27]. A correlation among the factors of HBI was carried out, with Pearson r coefficient. In addition, the relational style and the psychological suffering (anxiety and depression), were tested using Pearson r coefficient in correlation with HBI to establish the discriminant validity of HBI and to avoid eventual construct' overlap [29].
CFA was conducted the Maximum Likelihood as appropriate estimator: a three-factor model with 19 items and scales being allowed to correlate with each other as proposed by Reid and colleagues [17]. Model fit was assessed by means of the following fit indexes (30): the χ^2/df statistic; the *Root Mean Square Error of Approximation* (RMSEA) evaluating the fitting of the model to the general population (the RMSEA value indicates a good adaptation the more its value approaches "0", Browne and Cudek [31] suggest that values ranging from .05 and .08 are indicative of an adequate fit); the *Comparative Fit Index* (CFI) display scores between 0 and 1 (a value over .95 is considered excellent and a value between .90 and .95 considerate a good index) and the *(Standardized) Root Mean Square Residual* (SRMR) indicates the difference between the residuals of the sample covariance matrix and the hypothesized model, an acceptable value is considered less than .08.

Results

Sample

The sample recruited was composed by 1000 subjects [females: 711 (71.1%); males: 289 (28.9%)], with a mean age of 29.58 ± 10.94 years. Most subjects were in a relationship (n = 663; 66.3%), while the 337 (33.7%) declared themselves as single. Education levels are distributed as follows: secondary education (n = 29; 2.9%), high secondary education (n = 448; 44.8), bachelor degree (273; 27,3%) master's degree (169; 16.9%), post-graduation degree (81; 8.1%) (Tab. I).

Reliability

The analysis of internal consistency showed an overall Cronbach's α coefficient of .925. In the three subscales, the Cronbach α coefficient was .905 for coping factor, .868 for control factor, and .809 for consequences factor.

Confirmatory analysis

We testes a theory driven model by means of a CFA (Fig. 1): a three-factors model with 19 items and scales being allowed to correlate with each other. Fit indices were: c^2/df = 5.951, SRMR = .046, CFI =.925, RMSEA =.070. According to these goodness-fit indices, a good adequacy of the model was shown, according to the norms, as suggested by the field literature [32,33]. Also, these results are similar to those obtained by Bothe and colleagues in a recent reanalysis of HBI in a large non-clinical sample (CFI = .940; RMSEA = .071) [19]. Table II shows the factors loading for 19 item and 3 factors, which are adequate.

Correlation among HBI scales

Moreover, we found the positive correlations among the HBI domains. Each of the domains positively correlate with another subscale of the HBI, e.g., the coping factor has a positive correlation with control factor (r = .596; p < .0001), with consequences (r = .639; p < .0001), and with the total score of the HBI (r = .883; p < .0001). In addition, control factor correlates positively with consequences factor (r = .590; p < .0001) and with the total score of the HBI (r = .829; p < .0001), and consequences factor has a positive association with the total score of the HBI (r = .829; p < .0001).

Discriminant validity

In order to investigate the eventual construct' overlap

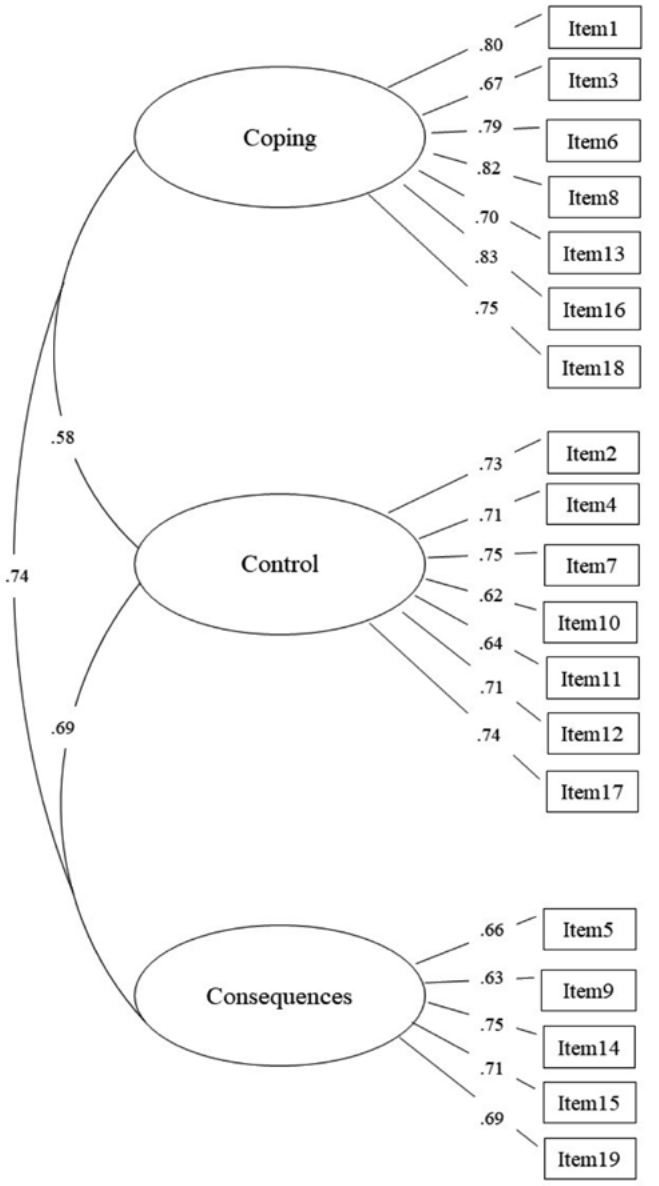

FIGURE 1. *Confirmatory factor analysis of HBI. Model shows standardized parameters estimat.*

TABLE I. *Sociodemographic characteristics of sample (n = 1000).*

	N (%)	M (SD)
Age		29.58; (10.94)
Gender Female Male	711; (71.1) 289; (28.9)	
Education Secondary High Secondary School Bachelor degree Master's degree Post-Graduation degree	29; (2.9) 448; (44.8) 273; (27.3) 169; (16.9) 81; (8.1)	
Relationship status Single In a relationship	337; (33.7) 663; (66.3)	

TABLE II. *Factor loadings of 19-items of HBI.*

	Coping	Control	Consequences
Item			
HBI1	.800		
HBI2		.733	
HBI3	.674		
HBI4		.715	
HBI5			.657
HBI6	.792		
HBI7		.749	
HBI8	.817		
HBI9			.635
HBI10		.623	
HBI11		.644	
HBI12		.709	
HBI13	.696		
HBI14			.753
HBI15			.713
HBI16	.835		
HBI17		.741	
HBI18	.747		
HBI19			.686

among the HBI and its subscales and other related measures, Pearson correlational analyses were computed. We, therefore, have tested different but associated constructs as anxiety-depression symptoms and attachment styles, in the determination of discriminant validity. We found positive associations among HBI total score and PHQ-9 ($r = .404$; $p < .0001$, GAD-7 ($r = .326$; $p < .0001$), RQ-Secure ($r = -.086$; $p < .05$), RQ-Preoccupied ($r = .250$; $p < .0001$), RQ-Fearful ($r = .236$; $p < .0001$), and RQ-Dismissing ($r = .084$; $p < .05$). Also, the HBI subscales of HBI revealed similar correlation coefficients as shown in Table III.

Discussion

This study has provided the first validation of the HBI in the Italian language and it is proposing its implementation for the assessment of hypersexual behavior in both clinical and research contexts.

The easy and quick administration together with the good psychometric characteristics of this tool are the main qualities emerging after our validation, aspects that should encourage the use of HBI in Italy.

In particular, the internal consistency assessed with Cronbach's α revealed high values for the overall coefficient and in the three subscales, that were similar to the original version [17].

The CFA showed that the first-order model with three factors demonstrated an acceptable fit, and the factor loadings were adequate, as also the correlations between the factors. In comparison with the previous validation studies [17,34], the fit indices and the factor loadings were lower in our analysis. These lower values may be due to the diversity of the present large-scale sample, composed by a non-clinical population with a higher percentage of females. Nonetheless, our results overlap the ones obtained by previous validations, and the goodness of the model indices suggests that HBI is a reliable instrument to measure the hypersexual behavior in the general population [34]. Moreover, the correlation coefficients among the scales demonstrated another good characteristic on the validity of this test. In this regard, the use of the scales of HBI is fundamental to better describe the hypersexuality. The scales of HBI represent a large strong point of this psychometric tool in the assessment of problematic sexuality together with its phenomenology. For instance, the Coping factor is considered a central factor for the hypersexual behavior in response to stress, anxiety or depression [13]. At the same time, the Control factor gives information about the emotional-cognitive aspects related to the hypersexuality and their functional or dysfunctional balance [35]. Conversely, the Consequences scale gives indication about the insight skill of a possible subject toward the dark side of hypersexual behavior which negatively impacts the quality of life, social and work functioning [36].

TABLE III. *Discriminant validity.*

	Depression	Anxiety	RQ Secure	RQ Preoccupied	RQ Fearful	RQ Dismissing
HBI	.404**	.326**	- .086**	.250**	.236**	.084*
Coping	.407**	.354**	- .085**	.246**	.212**	.084**
Control	.293**	.210**	- .096**	.197**	.193**	.073*
Consequences	. 308**	.239**	- .018	.177**	.193**	.047

*Correlation values in each cell indicate Pearson r; *p < .05; **p < .01*

From our analysis it also emerged that the HBI correlates with depression, anxiety and dimensions of insecure attachment, as previous literature demonstrated [2,3,37]. However, these correlations with other psychometric measures are in line with the discriminant validity and, therefore we have observed no construct'overlap.
This is worth of noting because hypersexual behavior can be considered as a comorbid indicator of other forms of psychopathologies. On the other hand, in different cases, hypersexuality is a consequence of another primary mental or sexual disorder [6,37,38].
Indeed, the diagnosis of hypersexuality is conceptually very difficult, even though we can rely on the ICD-11 criteria for the sexual compulsive disorder. This is due to the low rate of the symptom. In fact, approximately the 1-3% of the population meets the criteria for hypersexual *per se* [19,39,40], although some studies also indicate a percentage up to 6% [40,41]. Moreover, according to an ecumenic vision of diagnostic process, the psychometric assessment should be integrated into a more complex psychodiagnostic phase, implementing an evaluation of personality [8,34]. Hypersexuality can be considered in fact both a behavioral reactive form to stressful life events, and a comorbidity factor to other psychopathologies [6]. Therefore, we have taken into consideration the Italian validation of HBI a useful tool for the assessment of a problematic sexuality into a more complex diagnostic process, to care of patients seeking professional help for dysregulated sexological conducts. At the same time, HBI is an effective tool in research even to set up an experimental protocol focused on a better knowledge of hypersexuality or related disturbances.
This study suffers from some limitations, as the unbalanced gender distribution, although it is similar to most recruitment in convenience samples. Moreover, another limit is the non-clinical population recruited. Future investigations on patients, through case-control studies, will be necessary to establish a reliable cut-off score of HBI in Italian people.

Conclusions

Italian validation of HBI has revealed good psychometric properties for the evaluation of hypersexual behavior. To date, HBI is a useful tool to recognize hypersexuality into the research protocol and the clinical practice. It should be considered the first choice test for evaluating this peculiar area of a problematic sexuality.

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