

Hikikomori, problematic internet use and psychopathology: correlates in non-clinical and clinical samples of young adults in Italy

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SUMMARY

Objectives

The aims of this study were to explore hikikomori (prolonged social withdrawal) as well as its relationship with problematic internet use and other psychopathology.

Methods

A total of 66 young adults in Italy were recruited for this study consisting of: a non-clinical sample recruited through an online survey ($n = 47$), and a clinical sample of patients with a psychiatric disorder at onset ($n = 19$).

Results

Our findings demonstrated the occurrence of hikikomori in both the non-clinical and clinical samples ($n = 5$). Brief episodes of social withdrawal (i.e., duration between one and three months) were also reported by participants ($n = 10$). Hikikomori symptoms were associated with overall personality dysfunction in both samples ($r = .643, p < .001$; $r = .596, p < .01$, in the non-clinical and clinical sample, respectively). Problematic internet use was related to interpersonal sensitivity ($r = .309, p < .05$) and depression ($r = .475, p < .05$) in the non-clinical and clinical samples, respectively.

Conclusions

We demonstrated the occurrence of hikikomori in both non-clinical and clinical samples of Italian young adults. Clinical features of psychopathology (e.g., self- and other-directed aggressive behaviors, substance misuse) were more prevalent among hikikomori participants of the clinical sample. Moreover, symptoms of hikikomori showed strong associations with overall personality dysfunction. Our results highlighted the need to disentangle the intricate relation between hikikomori and psychopathology and they were discussed considering scientific advances. Finally, findings of this study suggested that online survey is a useful methodology to identify young adults with hikikomori. Further research with larger sample sizes is needed to confirm our data.

Key words: technology use, hikikomori, internalizing symptoms, emerging adulthood, personality functioning

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Introduction

Social withdrawal is an "umbrella term" ¹ that refers to the voluntary behaviour of isolating oneself from the interactions with peers. Its roots may lie in biological aspects and parenting behaviours ^{1,2}. The changes that occur in adolescence can increase social isolation and constitute a risk factor for psychological distress subsequently in life ³⁻⁵. Although it is mainly considered

a symptom of other psychopathological disorders, in the last decade the interest of researchers has been focusing on social withdrawal itself^{6,7}. The present study focused attention on brief and prolonged episodes of social withdrawal to increase knowledge about the phenomenon in young adulthood.

Hikikomori (prolonged social withdrawal)

The scientific debate concerning the definition and conceptualization of *hikikomori*, a specific type of social withdrawal also commonly referred to as *prolonged social withdrawal* or *pathological social withdrawal*, has been enhanced by some recent studies. Kato, Kanba and Teo^{8,9} revised the diagnostic criteria for hikikomori as “a form of pathological social withdrawal or social isolation whose essential feature is physical isolation in one’s home” (p. 117). Marked social isolation in one’s home (criterion 1), duration of continuous social isolation of at least 6 months (criterion 2) and significant functional impairment or distress associated with the social isolation (criterion 3) must be endorsed to diagnose hikikomori. Importantly, withdrawal severity may be specified, according to the degree to which the subject leaves his home (i.e., *mild* = 2-3 days/week; *moderate* = 1 day/week or less; *severe* = to rarely leave the single room). Individuals with a duration of continuous social withdrawal of at least 3 but less than 6 months should be considered *pre-hikikomori*^{8,9}. The authors have also specified other (not mandatory) aspects to better characterize the condition (e.g., social participation, in-person social interaction, indirect communication, loneliness, co-occurring condition).

The first aim of our study was to examine the occurrence and the characteristics of hikikomori phenomenon among Italian young adults. While hikikomori was initially reported in Japan, it has since been described as a syndrome worldwide¹⁰⁻¹⁴. Researchers have also shown presence in Western countries that are culturally distinct from Japan, such as France¹¹, Spain¹³, Ukraine¹², and the USA¹⁴. To the best of our knowledge, only case reports of hikikomori have been reported in Italy^{15,16}.

Following the suggestion of Kato and colleagues⁹ regarding the need to consider this condition as a public and mental health concern, the present study aimed to expand scientific knowledge on hikikomori and its characteristics in a western sociocultural context. Specifically, a non-clinical and clinical sample of Italian young adults were considered for this investigation.

Symptoms of hikikomori and problematic internet use

The second aim of our study was to examine the relationship between symptoms of hikikomori and problematic internet use. Despite growing acknowledgement concerning the different activities and functions of digital technologies, recent research has shown that the problematic use of internet technology has a negative impact on physical

health as well as on emotional and behavioural functioning¹⁷. The advent of the internet and new technologies (e.g., computer, smartphone, videogame console) may contribute to a shift from direct to indirect forms of play and communication. These changes may have an influence on the psychological and behavioural development of young individuals, affecting the worldwide emergence of hikikomori phenomenon⁸. Symptoms of internet addiction have been investigated in 41 socially withdrawn youth referred to mental health centres and several psychiatric clinics in Korea¹⁸. Approximately 55% were at high risk for Internet addiction and 10% were shown to be addicted. Furthermore, around 30% of a sample comprising 190 Spanish adults treated at home for social withdrawal showed Internet addiction behaviours¹³. Finally, two recent studies demonstrated an association between problematic internet use and symptoms of social withdrawal in non-clinical young adults^{19,20}.

In light of the above considerations, we hypothesized to find evidence of hikikomori occurrence both in a non-clinical and clinical sample of Italian young adults according to the criteria defined by Kato and colleagues^{8,9}. Additionally, we expected an association between symptoms of hikikomori and problematic internet use.

Materials and methods

Participants and recruitment method

In this cross-sectional study, data were collected from two samples, one a non-clinical sample and the other a clinical sample. The non-clinical sample consisted of young adults who completed an online survey in October 2019. An age between 18 and 25 years was the inclusion criterion, while a diagnosis for psychiatric disorders was the exclusion criterion. The clinical sample consisted of young adults with a psychiatric disorder at onset and in the acute phase. They were recruited between September 2018 and November 2019 at the Psychiatric Residential Structure “Casa di Cura Villa Armonia Nuova” in Rome, Italy. An age between 18 and 25 was the inclusion criterion. Exclusion criteria included: neurological disease, inability to understand written Italian or to participate in the procedure, and moderate to severe mental retardation.

Data procedures

After the exclusion of one participant to avoid inclusion of possible outliers due to extreme values on two of the questionnaires, 47 young adults constituted the non-clinical sample. To advertise the survey, two social media platforms were used (i.e., WhatsApp and Facebook). The respondents’ consent was obtained online by reading and approving an informed consent, before proceeding to the compilation of the questionnaire battery. To limit response bias, the study was presented as

a survey on young people's Internet use and the related risky online behaviours. Research data was encoded and stored on password protected drives to ensure respect for data protection and privacy. Ownership and access to data was limited to the research team.

For the clinical sample, one participant was excluded from analysis due to extreme values on the questionnaires that indicated unreliability of the responses, resulting in nineteen young adults. Informed consent was obtained from both participants and their parents before enrolment in the study. After providing informed consent, and once the acute symptomatology phase was over, the questionnaires were briefly presented to the participants individually. The administration lasted approximately 40 minutes and participants individually completed the questionnaires together with the clinical psychologist of the Psychiatric Residential Structure. This study was approved by the Ethics Committee of the Department of Dynamic and Clinical Psychology, Sapienza University of Rome.

Measures

Hikikomori (prolonged social withdrawal) diagnosis

This study used the definition of hikikomori proposed by Kato and colleagues^{8,9}. The following symptoms were investigated for "present" and "past" episodes of hikikomori through a questionnaire designed for this study: (1) marked social isolation in one's home (i.e., leaving the house 3 days/week or less), and (2) duration of social withdrawal of at least six months. Isolation caused by physical illness (e.g., with the impossibility of walking or moving), pregnancy or childbirth, working from home, or the need to stay at home to take care of children, were considered exclusion criteria of hikikomori. Lack of social participation (i.e., 3 days/week or less), lack of in-person social interaction (i.e., 3 days/week or less), self-reported withdrawal motivation, other-directed aggression, self-injury (without suicidal intent) and suicidal behaviour during episodes of social withdrawal were also investigated only in participants who reported episodes of social withdrawal to further characterize the phenomenon.

The Web survey was conducted in October 2019 in order to identify and reach socially withdrawn youth according to Liu, Li, Teo, Kato, and Wong²¹ study methodology.

Hikikomori symptoms

We explored characteristics of individuals with a duration of the social withdrawal behaviour less than six months in order to better delineate the phenomenon of social withdrawal. Specifically, participants were considered to have experienced brief social withdrawal if they indicated to staying at home almost every day for at least one month but less than three.

Furthermore, symptoms of social withdrawal were examined using two self-report measures.

The clinical sample completed the Hikikomori Symptoms Scale (HSS) firstly used in the survey of the Cabinet Office of the Government of Japan²². It consists of four items that explore the symptoms of social withdrawal (e.g., "I sometimes have in my mind an idea that I want to keep at home or in my room"; "When bad things happen, I do not feel like I want to go outside"). For each item, the respondent is presented with six response choices (from 1 = "absolutely not true" to 6 = "absolutely true"). The scale showed good psychometric properties²². In the present study, Cronbach's alpha for the scale was.66. The non-clinical sample completed the Hikikomori Questionnaire (HQ-25), a new validated instrument with good psychometric properties to evaluate symptoms of hikikomori²³. This questionnaire was not available when the research involving the clinical sample was planned and conducted. The HQ-25 is a self-report questionnaire including 25 items that evaluate the severity of hikikomori symptoms over the preceding 6 months. Typical psychological features and behavioural patterns of hikikomori syndrome, such as socialization, isolation, emotional support, and a sense of alienation from society, are investigated. Participants respond on a 5-point Likert scale (from 0 = "strongly disagree" to 4 = "strongly agree"). The HQ-25 has a score range of 0-100. Higher values indicate higher symptomatology. Teo and colleagues²³ reported good psychometric properties and proposed a cut off score of 42 to discriminate individuals at risk for hikikomori. In the present study, Cronbach's alpha for the questionnaire was.92.

Psychopathology

Information on the diagnoses of psychiatric disorders were determined by consulting the medical records of the clinical sample participants and asking specific questions to the non-clinical sample participants during the online survey (i.e., "Do you suffer from a medical or psychological disorder that has been diagnosed by a health professional?"; "If yes, please indicate what the disorder is and how long you have been diagnosed with the disorder."). Information on substance use (i.e., psychoactive substances and alcohol) in the last six months was recorded. Three subscales of the *Brief Symptom Inventory* (BSI)²⁴ were also administered to participants. The BSI is a 53-item self-report instrument that assesses nine primary psychological symptom dimensions during the past seven days. For the purposes of the present study, interpersonal sensitivity, depression, and anxiety dimensions were used. Respondents rated each item on a 5-point Likert scale (from 0 = "never" to 4 = "always"). The reliability of the BSI dimensions of interest proved to be good in a sample of Italian adults²⁵. In the present study, Cronbach's alpha of the three dimensions were.70,.84,.78 (i.e., anxiety, depression, and interpersonal sensitivity, respectively) for the non-clinical sample and.88,.88,.76, for the clinical sample.

The *Internet Disorder Scale (IDS-15)*²⁶ is a self-report scale composed of 15 items. It assesses the severity and impact of internet addiction by focusing upon users' online leisure activity from any device with internet access over the past year. Four distinct domains related to internet addiction are investigated: escapism and dysfunctional emotional coping; withdrawal symptoms; impairments and dysfunctional self-regulation; and dysfunctional Internet-related self-control. The respondents rated each item on a 5-point Likert scale (from 1 = "strongly disagree" to 5 = "strongly agree"). The total score can range from 15 to 75, with higher scores being an indication of higher degrees of internet addiction. The Italian version of the IDS-15 demonstrated good psychometric properties²⁷. In the present study, Cronbach's alpha for the scale was .85 for the non-clinical sample and .94 for the clinical sample.

Finally, we explored the main activity for which the subject used the internet, classifying whether it was social (e.g., social network, online videogame) or non-social (e.g., listening to music, watching TV series or movies).

Maladaptive personality functioning

The *Personality Inventory for DSM-5 Brief Form (PID-5-BF)*²⁸ is a scale that evaluates five maladaptive trait domains of personality functioning including Negative Affect, Detachment, Antagonism, Disinhibition, and Psychoticism. The PID-5-BF includes 25 items, five for each domain, with four response alternatives distributed on a 4-point Likert scale (from 0 = "very false/often false" to 3 = "very true/often true"). The maladaptive functioning of the individual, linked to the domains and to the total score, increases as the score increases. In the present study, the scale showed good internal consistency (a Cronbach's α of .86 and .74 for the non-clinical and clinical samples respectively).

Statistical analysis

Statistical analysis was performed using SPSS version 25.0 (IBM SPSS Statistics, Armonk, NY). Given the small sample size, statistical analysis was limited to descriptive statistics and Pearson correlations to examine relationships between the variables of interest. To explore the relationship between social withdrawal and the other variables, Pearson correlation analysis were performed. We set statistical significance at $p < 0.05$.

To determine whether the sample size was large enough for the correlation analyses, we ran an a priori power analysis using the "G*Power 3.1"²⁹. Results showed that the minimum samples size to detect a medium-to-large effect size (i.e., p of .4), given a power of 0.80 and an alpha of .05 for two-tailed significance, was $n = 44$. Instead the minimum samples size to detect a large effect size (i.e., p of .5), given a power of 0.80 and an alpha of .05 for two-tailed significance, was $n = 26$. Based on these calculations, the non-clinical sample appeared to be ad-

equated to detect a medium-to-large effect size, while the size of the clinical sample was less than that indicated by the a priori power analysis to detect a large effect.

Results

Focusing on participants' education, in the non-clinical sample consisting of 47 participants (38.3% males, $n = 18$), ten (21.3%) had obtained an early secondary school education, 27 (57.4%) completed high school, and ten (21.3%) had a university degree. In the clinical sample consisting of nineteen participants (52.6% males, $n = 10$), one (5.3%) had obtained elementary education, eight (42.1%) an early secondary school education, and ten (52.6%) completed high school.

No participants in the non-clinical sample were diagnosed with a personality or clinical disorder by a mental health professional.

34 and 68.4% of participants reported substance use in the non-clinical and clinical sample, respectively. Furthermore, 27.7 and 15.8% of the non-clinical and clinical samples used the internet for non-social purposes. Regarding scores on the questionnaires exploring social withdrawal, the mean score on the HQ-25 for the non-clinical sample was 22.25 (SD = 15.07) while the clinical sample showed a mean score of 4.5 (SD = 0.62) on the HSS. Table I presents the descriptive statistics for the non-clinical and clinical samples.

Hikikomori and brief social withdrawal

12.8% ($n = 6$) of participants of the non-clinical sample and 47.4% ($n = 9$) of participants of the clinical sample reported a lifetime episode of social withdrawal (i.e., hikikomori or brief social withdrawal).

In particular, as shown in Table I, in the non-clinical sample, two (4.3%) participants had experienced a condition of hikikomori and four (8.5%) reported a brief episode of social withdrawal. Regarding the period of social withdrawal episodes, the two hikikomori participants were in a current condition of prolonged social withdrawal. Instead, of the four participants who reported brief social withdrawal, one and three experienced current and past episodes of isolation, respectively.

According to the cut-off score for the HQ-25 proposed by Teo and colleagues²³, six subjects (12.8%; males = 2) from non-clinical sample screened positive for hikikomori. The cut-off of the HQ-25 correctly identified the two subjects who met the diagnosis of hikikomori. On the contrary, none of the subjects who reported a brief episode of social withdrawal showed a total score higher than the cut-off on the HQ-25.

In the clinical sample, 3 (15.8%) participants reported hikikomori and 6 (31.5%) showed a brief episode of social withdrawal. Regarding the period of social

TABLE I. Participants' characteristics ($n = 66$).

	Non-clinical sample ($n = 47$) n (%)	Clinical sample ($n = 19$) n (%)
<i>Demographics</i>		
Age ($M \pm SD$)	20.49 \pm 2.64	21.05 \pm 2.07
Male	18 (38.3)	10 (52.6)
<i>Education</i>		
Elementary	0	1 (5.3)
Early secondary school	10 (21.3)	8 (42.1)
High school	27 (57.4)	10 (52.6)
University degree	10 (21.3)	0
<i>Substance use</i>		
Non-social internet use	16 (34.0)	13 (68.4)
	13 (27.7)	3 (15.8)
<i>Maladaptive personality ($M \pm SD$)</i>		
Overall personality dysfunction	0.81 \pm 0.41	1.20 \pm 0.36
<i>Psychopathology ($M \pm SD$)</i>		
Interpersonal Sensitivity	0.81 \pm 0.84	1.21 \pm 0.97
Depression	0.78 \pm 0.62	1.17 \pm 0.90
Anxiety	0.77 \pm 0.59	1.16 \pm 1.02
Problematic internet use	38.08 \pm 9.31	39.37 \pm 13.53
<i>Lifetime episode of social withdrawal</i>		
Hikikomori	2 (4.3)	3 (15.8)
Brief social withdrawal	4 (8.5)	6 (31.5)

Note. Participants were evaluated for a current or past social withdrawal episode

withdrawal episodes, two of the three participants who reported hikikomori were in a current condition of prolonged social withdrawal. Instead, five of the six participants who reported brief social withdrawal experienced a past episode of isolation.

Patients who reported hikikomori received the following diagnoses: Psychotic Disorder Not Otherwise Specified ($n = 1$); Mood Disorder Not Otherwise Specified ($n = 1$); Schizoid Personality Disorder and Mood Disorder Not Otherwise Specified ($n = 1$) (Tab. II).

Regarding the prevalence of characteristics related to social withdrawal, non-clinical and clinical samples showed similarity in lack of social participation and in-person social interaction but also differences in self-reported withdrawal motivations. Participants of the clinical sample who reported episodes of social withdrawal during the isolation period demonstrated self- and other-directed aggressive behaviours. Moreover, non-social internet use was more prevalent among participants of the clinical sample who reported social withdrawal episodes.

Correlations between symptoms of social withdrawal, problematic internet use, and psychopathology

Symptoms of social withdrawal were not found to be significantly associated to problematic internet use (Tabs. III-IV). However, a trend toward a positive correlation between social withdrawal and problematic internet use ($r = .278$, $p = .059$) was found in the non-clinical sample.

A positive association between symptoms of social withdrawal and overall personality dysfunction was reported in the two samples despite symptoms of social withdrawal were measured through different questionnaires.

In the non-clinical sample, symptoms of social withdrawal also showed significant positive associations with depression and interpersonal sensitivity. Furthermore, interpersonal sensitivity was associated to problematic internet use. In addition, a trend toward positive correlations were also found between social withdrawal and anxiety ($r = .287$, $p = .050$).

In the clinical sample, social withdrawal symptoms were not found to be significantly associated to other variables. However, near significant positive correlations

TABLE II. Characteristics of participants who reported a lifetime period of social withdrawal ($n = 15$) (i.e., hikikomori or brief social withdrawal), arranged by sample.

Variables	Non-clinical sample		Clinical sample	
	Hikikomori ($n = 2$)	Brief social withdrawal ($n = 4$)	Hikikomori ($n = 3$)	Brief social withdrawal ($n = 6$)
	n (%)	n (%)	n (%)	n (%)
Male	1 (50)	2 (50)	1 (33.3)	3 (50)
Substance use	0	1 (25)	2 (66.7)	3 (50)
Non-social internet use	1 (50)	2 (50)	2 (66.7)	5 (85)
<i>Social withdrawal characteristics</i>				
Lack of social participation	2 (100)	4 (100)	3 (100)	6 (100)
Lack of in-person social interaction	2 (100)	3 (75)	3 (100)	5 (83.3)
Physical aggression towards others	0	0	1 (33.3)	0
Self-injury	0	0	3 (100)	3 (50)
Suicidal ideation	0	1 (25)	3 (100)	4 (67)
Suicidal attempt	0	0	0	1 (15)
<i>Self-reported withdrawal motivation</i>				
Low self-esteem	1 (50)	2 (50)	0	0
Feeling safe only at home	0	1 (25)	0	3 (50)
Feeling difficulty in doing things	1 (50)	0	0	2 (33)
Bullying episodes	0	1 (25)	1 (33.3)	0
Psychiatric disorder	0	0	2 (66.7)	0
<i>Psychiatric hospitalization for</i>				
Severe withdrawal	-	-	1 (33.3)	2 (33)
Suicide attempt	-	-	1 (33.3)	4 (67)
Positive symptoms	-	-	1 (33.3)	2 (33)
Anhedonia	-	-	1 (33.3)	0
<i>Current psychiatric diagnosis</i>				
Mood disorder not otherwise specified	-	-	2 (66.7)	3 (50)
Psychotic disorder not otherwise specified	-	-	1 (33.3)	1 (15)
Schizoid personality disorder	-	-	1 (33.3)	0
Schizoaffective disorder	-	-	0	1 (15)
Major depressive disorder	-	-	0	1 (15)

Note. Participants were evaluated for a current or past social withdrawal episode. Reason for psychiatric hospitalization and diagnosis percentages total more than 100% as participants may have more than 1 reason and diagnosis as reported in medical records. Characteristics and diagnosis with a frequency of zero are not reported.

were also found between social withdrawal and interpersonal sensitivity ($r = .416$, $p = .077$) as well as between social withdrawal and anxiety ($r = .398$, $p = .091$). Finally, problematic internet use positively correlated with depression in the clinical sample.

Discussion and conclusions

This study was the first to examine hikikomori and its

relationship with problematic internet use in non-clinical and clinical Italian young adults. Our main finding suggested that episodes of hikikomori have been reported in both non-clinical and clinical samples, providing initial empirical evidence on the existence of the hikikomori among Italian young adults. These results are consistent with those of previous studies that reported cases of primary and secondary hikikomori in adult populations of western countries¹¹⁻¹⁴.

TABLE III. Pearson's correlations between the variables of interest in the non-clinical sample.

	1.	2.	3.	4.	5.	6.
1. Social withdrawal symptoms	1					
2. Overall personality dysfunction	.643‡	1				
3. Interpersonal sensitivity	.729‡	.555‡	1			
4. Depression	.716‡	.690‡	.733‡	1		
5. Anxiety	.287	.471†	.446†	.517‡	1	
6. Problematic internet use	.278	.228	.309*	.212	.281	1

Note. Social withdrawal symptoms as evaluated by the Hikikomori Questionnaire (HQ-25).

* $p < .05$; † $p < .01$; ‡ $p < .001$.

TABLE IV. Pearson's correlations between the variables of interest in the clinical sample.

	1.	2.	3.	4.	5.	6.
1. Social withdrawal symptoms	1					
2. Overall personality dysfunction	.596†	1				
3. Interpersonal sensitivity	.416	.352	1			
4. Depression	.294	.407	.767‡	1		
5. Anxiety	.398	.205	.765‡	.790‡	1	
6. Problematic internet use	-.163	.182	.127	.475*	.242	1

Note. Social withdrawal symptoms as evaluated by the Hikikomori Symptoms Scale (HSS).

* $p < .05$; † $p < .01$; ‡ $p < .001$.

Findings showed that 12.8% ($n = 6$) of participants from the non-clinical sample reported a lifetime episode of social withdrawal (i.e., hikikomori or brief social withdrawal). Namely, 4.3% ($n = 2$) revealed hikikomori phenomenon. Importantly, the HQ-25 cut-off score correctly identified them. Therefore, the present study emphasised the usefulness of the online survey as an effective methodology to reach young adults at risk of social withdrawal, in line with a previous study conducted through online survey that showed a prevalence of 6.6% for hikikomori (i.e., 9 subjects among 137 participants)²¹.

Focusing on the clinical sample, results highlighted that approximately half ($n = 9$) of participants reported a lifetime episode of social withdrawal (i.e., hikikomori or brief social withdrawal). In particular, 15.8% ($n = 3$) of participants reported hikikomori.

No difference in prevalence of social withdrawal lifetime episodes (i.e., hikikomori or brief social withdrawal) according to gender was detected in both samples. This finding is in line with that of another study¹² although several studies have reported a higher prevalence in males^{11,13,14}. As for clinical characteristics of social withdrawal, self- and other-directed aggressive behaviours were reported by participants of the clinical sample, in line with findings of previous studies¹¹⁻¹³. Substance use was also more common among participants of the clinical sample. These clinical features could help clinicians to differentiate between

participants with social withdrawal associated to clinical disorders, indicating poorer mental health⁷. Frankova¹² hypothesized that hostility and aggressive behaviours among hikikomori represent maladaptive emotion regulation strategies to deal with high levels of resentment, inner tension, self-doubt and low quality of life. These conditions were more frequent among participants with hikikomori associated with clinical disorders rather than among those who only showed hikikomori, indicating a personality trait (excitability and impulsivity) rather than other conditions. Moreover, clinical diagnoses of Mood Disorder Not Otherwise Specified and Psychotic Disorder Not Otherwise Specified of participants who reported prolonged social withdrawal could also indicate the difficulty in framing the phenomenon of hikikomori using diagnostic categories from the main diagnostic manuals currently available⁷.

The results of this study revealed that in both non-clinical and clinical samples, symptoms of social withdrawal as evaluated by the HQ-25 and HSS were strongly associated to overall personality dysfunction. This finding was in line with those of previous studies^{13,14,30}. As suggested by Suwa and Suzuki³¹, two type of hikikomori may be differentiated: a primary type, with no other psychopathology, and a secondary type, with clinical disorders in comorbidity. Malagon-Amor et al.¹³ showed that hikikomori condition was comorbid with different psychiatric disorders, including personality disorders. Specifically, 33 of 190

adults with hikikomori fulfilled the criteria for a personality disorder. Furthermore, Teo et al.¹⁴ provided evidence for the existence of both primary and secondary hikikomori. The authors reported that the majority of 22 participants with a history of hikikomori, 87% (n = 17), were diagnosed with psychiatric disorders. Avoidant and paranoid personality disorders were among the first and the third more commonly observed (i.e., in 41 and 32% of the sample, respectively). On the other hand, five participants did not show other clinical disorders in comorbidity¹⁴. Our study's findings suggest that the overall personality dysfunction conceptualized as a dimensional *continuum* is associated with hikikomori, with high dysfunction representing a risk factor. Hikikomori condition may represent the outcome of the dysfunctional adaptation process of young adults with high overall personality dysfunction to the increased social and environmental demands typical of young adulthood. Psychotherapy and intervention aimed at increasing psycho-social skills are recommended¹³.

In the non-clinical sample, symptoms of social withdrawal were related to interpersonal sensitivity and depression. On the contrary, no significant associations were observed between symptoms of social withdrawal and other symptoms of psychopathology in the clinical sample, except for overall personality dysfunction. In comparison, previous studies have reported significant relationships between social withdrawal and symptoms of affective disorders mainly in clinical samples¹¹⁻¹⁴. Regarding the present results, a possible reason is that there was no real association between variables of interest. Another explanation is that there might be an association, but this study was underpowered to detect it because there were not enough participants to detect small-to-medium effects. In fact, near significant positive correlations between social withdrawal, interpersonal sensitivity and anxiety in the clinical sample were also reported.

Furthermore, near significant positive correlations between social withdrawal, anxiety and problematic internet use in the non-clinical sample were found. Considering the fact that symptoms of internet addiction were associated to symptoms of social withdrawal in previous studies conducted in non-clinical and clinical samples^{13,18-20}, our findings may still be clinically important and warrant further consideration although they did not meet statistical significance. On the other hand, the lack of association between symptoms of social withdrawal and problematic internet use may also indicate that young adults with symptoms of social withdrawal are less motivated to pay attention to the use of the internet and, as a consequence, to not being problematically involved in it. In line with this hypothesis, Teo et al.¹⁴ showed that none of 22 participants with a history of hikikomori scored in the severe category of the Internet Addiction Test. Longitudinal studies should focus their attention on the relationship between problematic in-

ternet use and the risk for prolonged social withdrawal in young adults. Findings of the present study seem to suggest that non-social internet use is frequently reported by youth with a lifetime episode of social withdrawal.

Finally, problematic internet use was associated with interpersonal sensitivity (i.e., feelings of personal inadequacy and inferiority in comparison with others) in the non-clinical sample, and to depression (i.e., symptoms of dysphoric mood and affect as well as lack of motivation and loss of interest in life) in the clinical sample. These results are in line with previous studies that showed complex relationships between self-esteem, depression and problematic internet use and the role as risk factors of the former towards the last^{32,33}.

Findings of this study demonstrated that online surveys are a useful methodology to identify young adults at risk of social withdrawal and decreased mental health. In addition, our findings have possible significant clinical implications for the prevention and treatment of socially withdrawn youths, highlighting the relationship between symptoms of social withdrawal and overall personality dysfunction, in order to improve mental health and prevent a possible public health emergency.

Our results should be interpreted while keeping some limitations in mind. First, the study had a cross-sectional design; therefore, it was not possible to make causal inferences. Second, data are not representative of the entire young adult national population due to the recruitment methods and the small sample size. Third, social desirability response bias may also have affected the results.

We found evidence for hikikomori in non-clinical and clinical samples of Italian young adults. Clinical features of psychopathology (e.g., self- and other-directed aggressive behaviours, substance misuse) associated to social withdrawal could indicate poorer mental health. Moreover, symptoms of hikikomori showed strong association with overall personality dysfunction. Finally, findings of this study suggested that online survey is a useful methodology to identify young adults with hikikomori.

Ethical consideration

All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards, and with the ethical standards of the Ethics Committee of the Department of Dynamic and Clinical Psychology, Sapienza University of Rome.

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Conflict of interest

The authors declare to have no conflict of interest

Informed consent

Informed consent was obtained from all individual participants included in the study.

Author contributions

AS, RC, and FP contributed to the conceptualization of

the study. AS, RC, VS, CL, ES, VDG, FC, AM, and GI contributed to participant recruitment and data collection. AS, RC, FP, VS and AT analyzed the data. AS wrote the original draft of the manuscript. RC and AT provided critical revision of the manuscript. Finally, all the authors have approved the final version of the manuscript.

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