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RESEARCH ARTICLE

Metacognitive functions of patients with trichotillomania and skin picking disorder

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ABSTRACT

Objective: This study aimed to compare the metacognitive functions of patients diagnosed with trichotillomania (TTM) and skin picking disorder (SPD) with those of healthy controls (HCs).

Method: The study was conducted with 125 participants, 32 of whom had TTM, 47 had SPD, and 46 were HCs. A Sociodemographic Data Form, the Metacognition Questionnaire-30 (MCQ-30), Clinical Global Impression (CGI), Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI) were administered to the participants.

Results: It was determined that the subscale scores of "uncontrollability and danger" and "need to control thoughts" were significantly higher in patients with TTM and SPD compared with the HCs. There was a positive correlation between the patients' CGI scores and their MCQ-total scores. A positive and significant relationship was found between BDI and "uncontrollability and danger," "need to control thoughts," "cognitive self-consciousness," and MCQ-total scores. There was a positive correlation between the BAI and other subscales except for "positive beliefs" and MCQ-total scores.

Conclusion: Our study reveals dysfunctional metacognitions in TTM and SPD patient groups. The subdimensions of "uncontrollability and danger" and "need to control thoughts" are dysfunctional metacognitions that are prominent in both patient groups.

Keywords: Automatic type, focused type, metacognition, skin picking disorder, trichotillomania

INTRODUCTION

Trichotillomania (TTM) and skin picking disorder (SPD) are psychiatric disorders that cause hair loss or skin tissue damage, characterized by recurrent hair and skin picking, respectively (1,2). The prevalence of TTM is estimated to be 0.6%–2.4% (3–6) and SPD to be 1.4%–5.4% (7–10). Clinical and phenomenological similarities exist in both diseases, such as sex ratio, age of onset, comorbidities, and psychosocial dysfunction (3,8,11–13).

It has been suggested that TTM and SPD can be divided into two subtypes: automatic and focused (1,14–17). Automatic subtype pulling/picking behavior occurs mostly during sedentary actions; the person enjoys picking and occurs without awareness (18,19). In these cases, they are not aware until the picking behavior continues for some time or is completed (18). However, the pulling/picking behavior usually occurs to cope with emotions, such as anxiety and stress, or in response to an obsession in the focused type with full awareness (1,16,18,19).

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Metacognition is a metacognitive system that includes awareness of events and functions in one's mind and purposefully directing mental events and functions (20,21). In other words, metacognition is one's knowledge of what one knows, what one thinks about what one thinks, or one's eye on one's own cognitive process (22). It has been indicated that the metacognitive system plays a major role in the functional and adaptive functioning of human cognitive processes (22). Therefore, it is thought that any deviation in the metacognitive system would be an important factor in the development and continuation of many psychopathologies (23). According to this approach, evaluating the meaning of this kind of thinking is more important than the thoughts one has in the formation and maintenance of psychopathology (24).

TTM and SPD are in the category of "Obsessive–compulsive and related disorders" in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (25). Obsessive–compulsive and related disorders are symptomatically related because they are characterized by repetitive thoughts and behaviors and difficulty in inhibiting behaviors (25). Repetitive pulling/picking behavior is phenomenologically similar to the compulsive behaviors in obsessive–compulsive disorder (OCD), and it is thought that these behaviors result from the lack of inhibition processes (26). Many studies in the literature examine metacognition in OCD (27–37). According to the metacognitive model, individuals' cognitions about their cognitive processes and metacognitive regulation strategies play an important role in forming and continuing of obsessions and compulsions (38–40). Some people have dysfunctional metacognitions that affect their perspective on events, and these metacognitions cause them to develop dysfunctional reactions (38,40,41). Activating these dysfunctional metacognitive beliefs leads to a negative interpretation of intrusive thoughts, changes in emotion, and activation of ritual-related beliefs to reduce the perceived threat (42).

From all these perspectives, we think that despite the negative consequences of picking behavior in TTM and SPD, it is repetitive and compulsive, and because depression and anxiety often accompany it, metacognitive functions may be impaired. They may affect the severity of the disease. However, as far as we know, there are no studies in the literature examining metacognition in patients with TTM and SPD. The primary aim of our study was to examine the differences in metacognitive functions in patients with TTM and SPD compared with the healthy control (HC) group and determine their relationship with some clinical data. Second, we aimed to examine whether the automatic and focused-type patient groups differed regarding metacognitive characteristics. Finally, we aimed to assess the relationship between metacognition and depression and anxiety.

METHODS

Participants

Study participants were recruited among the patients who presented to the psychiatry outpatient clinic of Health Sciences University Sisli Hamidiye Etfal Training and Research Hospital between April 2019 and February 2020. Thirty-two patients diagnosed with TTM and 47 with SPD, evaluated by two psychiatrists according to the DSM-5 diagnostic criteria, were included in the study. Seventeen patients with TTM and 12 patients with SPD received psychopharmacological treatment. The remaining patients were newly diagnosed. The inclusion criteria for the study were as follows: diagnosis of TTM or SPD, age 16–70 years, having at least primary school education and agreeing to participate in the study. Sex and education matched forty-six healthy cases with no history of psychiatric disorder were included as a control group. The study's exclusion criteria were as follows: mental retardation, psychotic disorder, bipolar disorder, dementia, major medical illness, head trauma, and psychoactive substance abuse. A Sociodemographic Data Form, the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Clinical Global Impression (CGI), and Metacognition Questionnaire-30 (MCQ-30) were administered to the participants. Automatic and focused styles were captured using the Milwaukee Inventory for the Dimensions of Adult Skin Picking (43) and the Milwaukee Inventory for Styles of Trichotillomania-Adult Version (18) scales. Written informed consent was obtained from all participants after explaining the purpose and method of the study. The study was approved by the Health Sciences University Sisli Hamidiye Etfal Training and Research Hospital Ethics Committee (February 22, 2022, number: 3408/2022).

Assessment Instruments

Sociodemographic Data Form

Sociodemographic and disease status data were obtained using an information form prepared by the

interviewer. The form included information about the participants' sex, age, education level, employment status, marital status, family history of psychiatric illness, medical illness, drug use, previous treatment attempts, and characteristics of TTM and SPD. This information included questions about the presence of stressors at the onset of the disorder, triggering factors for picking behavior, the frequency of hair/skin picking, how long the picking behavior lasts, and what time of day the hair/skin is pulled.

Beck Depression Inventory

The BDI was developed to determine the presence and severity of depressive symptoms in adults (44). The scale consists of 21 items, and each is scored between 0 and 3. The total score ranges from 0 to 63. The cutoff point of the scale is 17. High total scores obtained from the scale indicate severe depression. A validity and reliability study has been conducted for the Turkish population (45).

Beck Anxiety Inventory

The BAI was developed to determine the frequency of anxiety symptoms in adults (46). It consists of 21 items, each scored between 0 and 3. The highest score that can be obtained from the scale is 63. A high total score indicates a high level of anxiety experienced by the person. The Turkish validity and reliability study has been conducted (47).

Clinic Global Impressions-Severity

The CGI-S scale is used to evaluate the severity of a mental disorder. It is based on a score between 1 and 7, according to the physician's observation (48). Scoring was performed by considering the frequency of hair/skin pulling, distress caused by the disease and impaired functionality, and the need for social support (49).

Metacognition Questionnaire-30

The scale was developed by Cartwright-Hatton and Wells (41). The same researchers later created the 30-item short form of the scale (MCQ-30) (23). The MCQ-30 consists of five conceptually different factors that relate to one another. These are: (i) positive beliefs, (ii) uncontrollability and danger, (iii) cognitive confidence, (iv) need to control thoughts, and (v) cognitive self-consciousness. The scale consists of 30 questions in total, and each question is scored between 1 and 4. The lowest score that can be obtained from the scale is 30, and the highest score is 120. An increase in the total score obtained from the scale indicates an increase in pathologic and dysfunctional metacognitive activities (36). The Turkish validity and reliability study has been conducted (22).

Statistical Analysis

The SPSS version 20.0 for the Windows software package (SPSS, Inc., Chicago, IL, USA) was used for statistical analysis. Descriptive statistics are given as numbers and percentages for categorical variables, and mean, standard deviation, minimum, and maximum for numerical variables. Demographic characteristics of the groups and MCQ-30 findings were analyzed as follows: Comparisons of numerical variables in more than two groups were made using one-way analysis of variance when the normal distribution condition was met in the groups and with the Kruskal–Wallis test when the normal distribution condition was not met. Subgroup analyses in parametric tests were performed using the Bonferroni test, and subgroup analyses in nonparametric tests were performed using the Mann–Whitney U test and interpreted using Bonferroni correction ($p<0.017$). The relations between numerical variables were analyzed using Pearson's correlation analysis when the normal distribution condition was met and Spearman's correlation analysis when the normal distribution condition was not met. The statistical alpha significance level was accepted as $p<0.05$.

RESULTS

Demographic Features and Clinical Data of Subjects

The study consisted of 125 participants; 32 with TTM, 47 with SPD, and 46 HCs. There was no statistically significant difference between the patient and control groups regarding age, sex, and years of education, and also between the TTM and SPD groups regarding disease duration, disease type, and CGI scores. Depression and anxiety scores of patients with TTM and SPD were found to be significantly higher than those of the control group ($p<0.001$ and $p=0.001$, respectively) (Table 1).

Metacognitive Functions and Clinical Features

The results of the comparison of the metacognition scale and subscales between the TTM, SPD, and control groups are given in Table 2. Accordingly, the MCQ-total score of the TTM group was significantly higher than that in the control group ($p=0.015$). When

Table 1: Demographic and clinical data of participants

Variables	TTM[a] (n=32)	SPD[a] (n=47)	HC[a] (n=46)	F	p
Age (years)	26.5±9.7a	34.8±15.4	28.9±11.2	5.237[b]	0.073
Sex (female), n (%)	26 (81.3)	38 (80.8)	36 (78.3)	0.139[c]	0.933
Education (years)	11.8±4	11.2±3.7	12.8±3.5	5.050[b]	0.080
Duration of disorder (years)	8.5±6.6	9.8.6±9.3	–	-1.056[d]	0.822
Type of disorder (automatic/focused)	19 (59.4)/13(40.6)	22 (46.8)/25 (53.2)	–	1.204[c]	0.272
CGI-S	4.2±0.9	4±0.7	–	-1.211[e]	0.226
BDI scale scores	21.7±12.1	20.1±11.8	6.6±6.5	46.322[b]	**<0.001***
BAI scale scores	21.4±13.6	20.4±13.7	8.1±6.8	32.462[b]	**<0.001***

BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; CGI-S: Clinic Global Impressions-Severity; HC: Healthy control; SPD: Skin picking disorder; TTM: Trichotillomania; a: Data are expressed as mean±standard deviation; b: Kruskal–Wallis test; c: Chi-squared test; d: One-way analysis of variance test; e: Mann–Whitney U test; *: p<0.001.

Table 2: MCQ-30 subscale and total scores of the participants

	TTM[a] (n=32)	SPD[a] (n=47)	HC[a] (n=46)	F	p
Positive beliefs	11.3±4.5	10.8±4.2	10.6±3.8	0.415[b]	0.817
Uncontrollability and danger	16.4±4.2	15.5±4.2	13.1±3.8	7.399[c]	**0.001***
Cognitive confidence	13.4±4.5	13.7±4.9	11.2±4.4	3.897[c]	**0.023***
Need to control thoughts	16.7±4.8	16.2±5.2	13.2±4.7	6.139[c]	**0.003***
Cognitive self-consciousness	17.4±3.6	16.7±3.9	17±3.7	1.794[b]	0.710
MCQ-30 total	74.9±14.3	72.9±16.5	65±13.9	5.014[c]	**0.008***

HC: Healthy control; MCQ-30: Metacognition Questionnaire-30; SPD: Skin picking disorder; TTM: Trichotillomania; a: Data are expressed as mean±standard deviation; b: Kruskal–Wallis test; c: One-way analysis of variance test; *: p<0.05.

Table 3: Comparison of the clinical features and MCQ-30 scores of the automatic and focused type

	Automatic[a] (n=41)	Focused[a] (n=38)	F	p
Age (years)	30.7±14.5	32.2±13.4	-0.683[b]	0.495
Sex (female), n (%)	38 (80.8)	26 (81.2)	0.002[c]	0.965
Education (years)	11.4±3.6	11.4±4.5	-0.353[b]	0.724
Duration of disorder (years)	10.6±9	7.8±7.2	-1.851[b]	0.064
CGI-S	4±0.9	4.1±0.7	-0.645[b]	0.519
BDI scale scores	20.9±12.3	20.5±11.4	0.414[d]	0.899
BAI scale scores	21.5±14.8	20.6±13.2	0.278[d]	0.728
Positive beliefs	11.5±4.5	10.5±4	-0.859[b]	0.390
Uncontrollability and danger	16.1±4.5	15.5±4.5	0.657[d]	0.513
Cognitive confidence	13.3±5.1	13.9±4.4	-0.560[d]	0.577
Need to control thoughts	16.6±5.5	16.2±4.5	0.395[d]	0.692
Cognitive self-consciousness	4±0.9	4.1±0.7	-0.645[b]	0.519
MCQ-30 total	74.9±17.7	72.5±13.1	1[d]	0.497

BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; CGI-S: Clinic Global Impressions-Severity; MCQ: Metacognition Questionnaire-30; a: Data are expressed as mean±standard deviation; b: Mann–Whitney U test; c: Pearson's Chi-squared test; d: Student's t-test.

the subscale scores were examined, the TTM and SPD groups' "uncontrollability and danger" (p=0.001 and p=0.015, respectively) and "need to control thoughts" (p=0.008 and p=0.014, respectively) were found to be significantly higher than those of the control group. There was a statistically significant difference between the patient and control groups in terms of "cognitive confidence" scores (p=0.023). However, after performing Bonferroni correction, no significant difference was detected between the groups. There

Table 4: Relationship between demographic data, clinical features, and metacognition of patient groups

	Age	Education	Duration of disorder	CGI-S	BDI	BAI	Positive beliefs	Uncontrollability and danger	Cognitive confidence	Need to control thoughts	Cognitive self-consciousness	MCQ-30 total
Age		**<0.001****	0.327	0.344	0.761	0.287	0.98	0.024	0.028	0.919	0.466	0.663
Education			0.462	0.348	0.66	0.558	0.909	0.364	0.153	0.059	0.558	0.774
Duration of disorder				0.481	0.548	0.881	0.654	0.235	0.986	0.059	0.336	0.654
CGI-S					0.971	0.662	0.066	0.303	0.066	0.37	0.176	**0.044***
BDI						**<0.001****	0.674	**<0.001****	0.104	**<0.001****	0.017	**<0.001****
BAI							0.198	**0.002***	**0.049***	**<0.001****	**0.003***	**<0.001****
Positive beliefs								**0.005***	0.673	**0.01***	**0.001***	**<0.001****
Uncontrollability and danger									**0.003***	**<0.001****	**<0.001****	**<0.001****
Cognitive confidence										**<0.001****	0.062	**<0.001****
Need to control thoughts											**<0.001****	**<0.001****
Cognitive self-consciousness												**<0.001****
MCQ-30 total												

BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; CGI-S: Clinic Global Impressions-Severity; MCQ: Metacognition Questionnaire-30; *: p<0.05; **: p<0.001.

was no significant difference between the patient and control groups in "positive beliefs" and cognitive self-consciousness' subscale scores (Table 2).

No statistically significant difference was found between the automatic and focused-type groups in demographic data, clinical characteristics, MCQ-total scores, and subscale scores (Table 3).

The relationship between the metacognitive subdimensions of demographic and some clinical data of the patient groups was analyzed using Spearman's correlation test. A negative correlation was found between age and "uncontrollability and danger" (r=-0.254), and a positive correlation was found between age and "cognitive confidence" (r=0.247). There was a significant positive correlation between CGI and MCQ-total scores (r=0.227). A positive and significant correlation was found between the BDI and "uncontrollability and danger" (r=0.428), "need to control thoughts" (r=0.532), "cognitive self-consciousness" (r=0.269), and MCQ-total scores (r=0.431). There was a positive correlation between BAI and MCQ-positive beliefs, as well as other subitems and total scores (range, r=0.222–0.443) (Table 4).

DISCUSSION

This study compared the metacognitive functions of patients with TTM and SPD with an HC group. At the same time, the metacognitive characteristics of automatic and focused patient groups were compared. Our study found that patients with TTM had a significantly higher MCQ-total score than the HC group. On the other hand, the MCQ-total scores of patients with SPD were similar to those of the HCs. The "uncontrollability and danger" and the "need to control thoughts" subscales were significantly higher in patients with TTM and SPD than in the control group. In addition, a positive and significant correlation was found between the severity of the disease and the total metacognition scores of patients with TTM and SPD.

The high scores of "uncontrollability and danger" in patients with TTM and SPD indicate that they have a high belief that anxiety cannot be controlled and that it is a dangerous situation. Similarly, the high scores of "need to control thoughts" indicate that both patient groups have metacognitions that some thoughts such as punishment, superstition, and being responsible should be controlled and that if they are not controlled, they will be responsible for the harmful consequences that arise and they will be punished. These results show that both patient groups have negative cognitions about worry and dysfunctional metacognitions, believing they need to control their thoughts to prevent this. It also shows that there are similar metacognitive pathologies for both groups. Accordingly, the significant increase in the need for control in both patient groups may be a factor that increases the picking behavior.

It has been suggested that negative beliefs about self, appearance, shame, fear of negative evaluation, having negative emotions, control, coping, and perfectionism (seeking/finding hairs of different colors/shapes) play a role in TTM (4,50–54). Certain cognitions and beliefs have been claimed to be associated with picking attacks, and such cognitions and beliefs can sustain or intensify picking (51). From this point of view, deterioration in metacognitive functions in patients with TTM and SPD may be a factor that triggers the picking behavior. Dysfunctional metacognitions about "uncontrollability and danger" and "need to control thoughts" may increase compulsive picking behavior. In parallel with our findings, we found that there was a positive correlation between the total metacognition scores of patients with TTM and SPD and the severity of the disease (CGI score). This finding shows that the worsening of metacognitive functions increased the severity of the disease in the TTM and SPD groups.

We could not find any study evaluating the metacognitive functions of patients with TTM and SPD in the literature. Much of the metacognitive studies in patients with OCD showed that the subdimensions of uncontrollability and danger and the need to control thoughts were higher than in HCs (27–29,31,34,36,55–57). Our data in these subdimensions are similar to the results of these studies. Based on these data, we showed that patients with TTM and SPD had metacognitive pathologies similar to those with OCD. Uncontrollability, danger and the need to control thoughts have been strongly associated with OCD symptoms (27). However, it is known that OCD comorbidity is common in patients with TTM and SPD (58–61).

According to our findings, we found positive correlations between the BDI and BAI, uncontrollability and danger, and the need to control thoughts. Severe depression and anxiety symptoms can be interpreted as increasing the severity of dysfunctional metacognitions. Comorbidities of depression and anxiety disorders are observed at a high rate in patients with TTM and SPD. On the one hand, the presence of comorbid conditions in these diseases increases the severity of the disease and worsens the course (62–65). Also, depressive symptoms can reinforce cognitive distortions associated with picking (63,66). Metacognitive functions are known to be pathological in depression and anxiety disorders (67–69). It is unclear whether the metacognitive functions in TTM and SPD are caused by the psychopathology of the disease or by the severity of depression and anxiety. However, considering the impairment in metacognitive functions in TTM and SPD and the adverse effects of disease severity, evaluating patients' metacognitive beliefs and adding metacognitive therapy practices in some patients may yield good results. Further studies are needed on this subject.

The most important limitation of our study is the small sample size. This situation limits the generalization of our findings for TTM and SPD patients. Further research is needed in larger samples. Another limitation is that the measurement tools used in the assessment are self-reported by the participants. In addition, the fact that we did not exclude comorbidity in the patient groups, and the high anxiety and depression scores may have adversely affected metacognitive functions. This limitation should be taken into account in future studies. Finally, the patients with TTM and SPD in our study are grouped according to focused/automatic subtyping. Recent studies recommended more complex models with exploratory factor analyses rather than the automatic/focused type (2). Future studies would determine and compare subtypes using exploratory analysis in larger samples.

CONCLUSION

Our study is the first in the literature to investigate metacognition in patients with TTM and SPD. Our findings revealed that patients with TTM and SPD have more impaired metacognitive functions than

HCs, but there are no metacognitive differences between the automatic and focused types. Our findings show dysfunctional metacognitions in patients with TTM and SPD and that they adversely affect the severity of the disease. From these metacognitions, the need to control thoughts with uncontrollability and danger is at the forefront. Therefore, in psychotherapeutic approaches, these two subdimensions should be considered in patients with TTM and SPD. Interventions on metacognitive beliefs might be helpful for some patients in this group.

Contribution Categories		Author Initials
Category 1	Concept/Design	H.D.
	Data acquisition	H.D.
	Data analysis/Interpretation	E.P.A.
Category 2	Drafting manuscript	H.D., E.P.A.
	Critical revision of manuscript	H.D., E.P.A., J.G.K.
Category 3	Final approval and accountability	O.A.O., K.O.K.
Other	Technical or materials support	O.A.O.
	Supervision	O.A.O., K.O.K.

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REFERENCES

1. Snorrason I, Belleau EL, Woods DW. How related are hair pulling disorder (trichotillomania) and skin picking disorder? A review of evidence for comorbidity, similarities and shared etiology. Clin Psychol Rev 2012; 32:618-629. [CrossRef]
2. Grant JE, Peris TS, Ricketts EJ, Lochner C, Stein DJ, Stochl J, et al. Identifying subtypes of trichotillomania (hair pulling disorder) and excoriation (skin picking) disorder using mixture modeling in a multicenter sample. J Psychiatr Res 2021; 137:603-612. [CrossRef]
3. Christenson GA, Pyle RL, Mitchell JE. Estimated lifetime prevalence of trichotillomania in college students. J Clin Psychiatry 1991; 52:415-417. [CrossRef]
4. Duke DC, Bodzin DK, Tavares P, Geffken GR, Storch EA. The phenomenology of hairpulling in a community sample. J Anxiety Disord 2009; 23:1118-1125. [CrossRef]
5. Duke DC, Keeley ML, Ricketts EJ, Geffken GR, Storch EA. The phenomenology of hairpulling in college students. J Psychopathol Behav Assess 2010; 32:281-292. [CrossRef]
6. Grzesiak M, Reich A, Szepietowski JC, Hadryś T, Pacan P. Trichotillomania among young adults: Prevalence and comorbidity. Acta Derm Venereol 2017; 97:509-512. [CrossRef]
7. Bohne A, Wilhelm S, Keuthen NJ, Baer L, Jenike MA. Skin picking in German students: Prevalence, phenomenology, and associated characteristics. Behav Modif 2002; 26:320-339. [CrossRef]
8. Hayes SL, Storch EA, Berlanga L. Skin picking behaviors: An examination of the prevalence and severity in a community sample. J Anxiety Disord 2009; 23:314-319. [CrossRef]
9. Keuthen NJ, Koran LM, Aboujaoude E, Large MD, Serpe RT. The prevalence of pathologic skin picking in US adults. Compr Psychiatry 2010; 51:183-186. [CrossRef]
10. Odlaug BL, Lust K, Schreiber LRN, Christenson GAH, Derbyshire KL, Grant JE. Skin picking disorder in university students: Health correlates and gender differences. Gen Hosp Psychiatry 2013; 35:168-173. [CrossRef]
11. Odlaug BL, Grant JE. Trichotillomania and pathologic skin picking: Clinical comparison with an examination of comorbidity. Ann Clin Psychiatry 2008; 20:57-63. [CrossRef]
12. Wilhelm S, Keuthen NJ, Deckersbach T, Engelhard IM, Forker AE, Baer L, et al. Self-injurious skin picking: Clinical characteristics and comorbidity. J Clin Psychiatry 1999; 60:454-459. [CrossRef]
13. Bohne A, Keuthen N, Wilhelm S. Pathologic hairpulling, skin picking, and nail biting. Ann Clin Psychiatry 2005; 17:227-232.
14. Lochner C, Seedat S, Stein DJ. Chronic hair-pulling: Phenomenology-based subtypes. J Anxiety Disord 2010; 24:196-202. [CrossRef]
15. Toit PL, Kradenburg JV, Stein DJ. Characteristics and phenomenology of hair-pulling: An exploration of subtypes. Compr Psychiatry 2001; 42:247-256. [CrossRef]
16. Schienle A, Zorjan S, Übel S, Wabnegger A. Prediction of automatic and focused skin picking based on trait disgust and emotion dysregulation. J Obsessive Compuls Relat Disord 2018; 16:1-5. [CrossRef]
17. Christenson GA, Ristvedt SL, Mackenzie TB. Identification of trichotillomania cue profiles. Behav Res Ther 1993; 31:315-320.
18. Flessner CA, Conelea CA, Woods DW, Franklin ME, Keuthen NJ, Cashin SE. Styles of pulling in trichotillomania: Exploring differences in symptom severity, phenomenology, and functional impact. Behav Res Ther 2008; 46:345-357. [CrossRef]
19. Pozza A, Albert U, Dèttore D. Early maladaptive schemas as common and specific predictors of skin picking subtypes. BMC Psychol 2020; 8:27. [CrossRef]
20. Crick F. Sasırtan varsayım. (S. Say, çev). Ankara: Tubitak Press, 2000. [Turkish]
21. Dienes Z, Perner J. A theory of implicit and explicit knowledge. Cambridge: Cambridge University Press, 1999. [CrossRef]

22. Tosun A, Irak M. [Adaptation, validity, and reliability of the Metacognition Questionnaire-30 for the Turkish population, and its relationship to anxiety and obsessive-compulsive symptoms]. Turk Psikiyatri Derg 2008; 19:67–80. [Turkish]

23. Wells A, Cartwright-Hatton S. A short form of the metacognitions questionnaire: Properties of the MCQ-30. Behav Res Ther 2004; 42:385-396. [CrossRef]

24. Senormancı O, Konkan R, Oya GG, Zihni SM. Metacognitive model of Obsessive Compulsive Disorder. Curr Appr Psychiatry 2012; 4:335-349. [Turkish] [CrossRef]

25. American Psychiatric Association (APA). Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Fifth Ed., Washington DC: American Psychiatric Association, 2013. [CrossRef]

26. Chamberlain SR, Blackwell AD, Fineberg NA, Robbins TW, Sahakian BJ. The neuropsychology of Obsessive Compulsive Disorder: The importance of failures in cognitive and behavioural inhibition as candidate endophenotypic markers. Neurosci Biobehav Rev 2005; 29:399-419. [CrossRef]

27. Myers SG, Wells A. Obsessive-compulsive symptoms : the contribution of metacognitions and responsibility. J Anxiety Disord 2005; 19:806-817. [CrossRef]

28. Moritz S, Peters MJ V, Lincoln M, Larøi F. Metacognitive beliefs in obsessive- compulsive patients: A comparison with healthy and schizophrenia participants. Cogn Neuropsychiatry 2010; 15:37-41. [CrossRef]

29. Cucchi M, Bottelli V, Cavadini D, Ricci L, Conca V, Ronchi P, et al. An explorative study on metacognition in obsessive-compulsive disorder and panic disorder. Compr Psychiatry 2012; 53:546-553. [CrossRef]

30. Dogan K, Solak OS, Ozdel K, Turkcapar MH. Comparison of metacognitions between obsessive compulsive subtypes and healthy controls. J Cogn Behav Psychother Res 2013; 2:34-40. [Turkish]

31. Yılmaz O, Boyraz RK, Kurtulmus A, Parlakkaya FB, Ozturk A. The relationship of insight with obsessive beliefs and metacognition in obsessive compulsive disorder. J Psychiatric Nurs 2020; 11:11-19.

32. Fisher PL, Wells A. Experimental modification of beliefs in Obsessive – Compulsive Disorder: a test of the metacognitive model. Behav Res Ther 2005; 43:821-829. [CrossRef]

33. Garcia-Montes JM, Lvarez MP-A, Cristina SB, Salvador PG, Adolfo JC. Metacognitions in patients with hallucinations and Obsessive-Compulsive Disorder: The superstition factor. Behav Res Ther 2006; 44:1091-1104. [CrossRef]

34. Hermans D, Martens K, Cort K De, Pieters G. Reality monitoring and metacognitive beliefs related to cognitive confidence in obsessive – compulsive disorder. Behav Res Ther 2003; 41:383-401. [CrossRef]

35. Ekinci O, Ekinci A. The relationship between clinical characteristics, metacognitive appraisals and cognitive insight in patients with obsessive-compulsive disorder. Nord J Psychiatry 2016; 70:591-598. [CrossRef]

36. Pazvantoglu O, Algul A, Ates MA, Sarisoy G, Ebrinc S, Basoglu C, et al. Metacognitive functions in Obsessive Compulsive Disorder in a Turkish Clinical Population: The relationship between symptom types and metacognition subdimensions. Bullet Clin Psychopharmacol 2013; 23:65-71. [CrossRef]

37. Exner C, Kohl A, Zaudig M, Langs G, Lincoln TM, Rief W. Metacognition and episodic memory in obsessive-compulsive disorder. J Anxiety Disord 2009; 23:624-631. [CrossRef]

38. Gwilliam P, Wells A. Does meta-cognition or responsibility predict obsessive – compulsive symptoms: A test of the metacognitive model. Clin Psychol Psychother 2004; 11:137–144.

39. Fisher PL, Wells A. Metacognitive therapy for obsessive – compulsive disorder: A case series. J Behav Ther Exp 2008; 39:117–132. [CrossRef]

40. Yoruk P, Tosun A. Metacognitive model of obsessive compulsive disorder. Curr Appr Psychiatry 2015; 7:190-207. [Turkish] [CrossRef]

41. Cartwright-Hatton S, Wells A. Beliefs about worry and intrusions: the metacognitions questionnaire and its correlates. J Anxiety Disord 1997; 11:279-296. [CrossRef]

42. Wells A. Metacognitive Therapy for Anxiety and Depression. New York: The Guilford Press, 2011. [CrossRef]

43. Walther MR, Flessner CA, Conelea CA, Woods DW. Milwaukee Inventory for the Dimensions of Adult Skin Picking (MIDAS): Initial development and psychometric properties. J Behav Ther Exp 2009; 40:127-135. [CrossRef]

44. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961; 4:561-571. [CrossRef]

45. Hisli N. Use of the Beck Depression Inventory with Turkish university students: reliability, validity and factor analysis. Turk Psikoloji Derg 1989; 7:3-13. [Turkish]

46. Beck A, Epstein N, Brown G, Steer R. An inventory for measuring clinical anxiety: The Beck Anxiety Inventory. J Consult Clin Psychol 1988; 56:893-897. [CrossRef]

47. Ulusoy M, Sahin N, Erkmen H. Turkish version of the Beck Anxiety Inventory: Psychometric properties. J Cogn Psychother An Int Q 1998; 12:163-172.

48. Guy W. Clinical Global Impressions (CGI) Scale, Handbook of Psychiatric Measures. Washington, DC: American Psychiatric Association, 2000.

49. Houghton DC, Capriotti MR, De Nadai AS, Compton SN, Twohig MP, Neal-Barnett AM, et al. Defining treatment response in trichotillomania: A signal detection analysis. J Anxiety Disord 2015; 36:44-51. [CrossRef]

50. Rehm IC, Nedeljkovic M, Thomas A. The role of cognitions and beliefs in trichotillomania : a qualitative study using interpretative phenomenological analysis. Behav Change 2020; 32:209-230.

51. Norberg MM, Wetterneck CT, Woods DW, Conelea CA. Experiential Avoidance as a Mediator of Relationships Between Cognitions and Hair-Pulling Severity. Behav Modif 2007; 31:367-381. [CrossRef]

52. Franklin ME, Kathryn Z, Kristin LB. Trichotillomania and its treatment: A review and recommendations. Expert Rev Neurother 2012; 11:1165-1174. [CrossRef]

53. Penzel F. The hair pulling problem: A complete guide to

trichotillomania. New York: Oxford University Press, 2003.

54. Gluhoski VL. A cognitive approach for treating trichotillomania. J Psychother Pract Res 1995; 4:277–285.

55. Onen S, Karakas G, Caykoylu A. The relationship between metacognitions and insight in obsessive- compulsive disorder. Compr Psychiatry 2013; 54:541-548 [CrossRef]

56. Barahmand U. Meta-cognitive profiles in anxiety disorders. Psychiatry Res 2009; 169:240-243. [CrossRef]

57. Yilmaz S, Izci F, Mermi O, Atmaca M. Metacognitive functions in patients who has obsessive compulsive disorder and major depressive disorder: a controlled study. Anadolu Psikiyatr Derg 2016; 17:451-458. [Turkish] [CrossRef]

58. Pirdogan E, Kenar J, Altunay I, Begenen A, Kivilcim Y, Ozer OA, et al. Clinical characteristics and comorbidities of patients with trichotillomania and skin picking disorder who admitted to a psychodermatology outpatient clinic: A comparative study. Turk Psikiyatr Derg 2020;32:100-108. [Turkish]

59. Keuthen NJ, Curley EE, Scharf JM, Woods DW, Lochner C, Stein DJ, et al. Predictors of comorbid obsessive-compulsive disorder and skin-picking disorder in trichotillomania. Ann Clin Psychiatry 2016; 28:280-288.

60. Lochner C, Keuthen NJ, Curley EE, Tung ES, Redden SA, Ricketts EJ, et al. Comorbidity in trichotillomania (hair-pulling disorder): A cluster analytical approach. Brain Behav 2019;9:e01456. [CrossRef]

61. Grant JE, Dougherty DD, Chamberlain SR. Prevalence gender correlates and comorbidity of trichotillomania. Psychiatry Res 2020; 288:112948. [CrossRef]

62. Neal-barnett A, Statom D, Stadulis R. Trichotillomania symptoms in African American women : Are they related to anxiety and culture? CNS Neurosci Ther 2011; 17:207–213. [CrossRef]

63. Grant JE, Redden SA, Medeiros GC, Odlaug BL, Erin E, Tavares H, et al. Trichotillomania and its clinical relationship to depression and anxiety. Int J Psychiatry Clin Pract 2017; 21:302-306. [CrossRef]

64. Odlaug BL, Kim SW, Grant JE. Quality of life and clinical severity in pathological skin picking and trichotillomania. J Anxiety Disord 2010; 24:823-829. [CrossRef]

65. Ricketts EJ, Snorrason Í, Kircanski K, Alexander JR, Thamrin H, Flessner CA, et al. A latent profile analysis of age of onset in pathological skin picking. Compr Psychiatry 2018; 87:46-52.

66. Duke DC, Keeley ML, Geffken GR, Storch EA. Trichotillomania : A current review. Clin Psychol Rev 2010; 30:181-193. [CrossRef]

67. Ozsoy F, Mehmet MK. Evalution of metacognitive functions in major depressive and panic disorder patients. J Contemp Med 2017; 7:42-49. [Turkish] [CrossRef]

68. Yılmaz AE, Genc T, Wells A. The temporal precedence of metacognition in the development of anxiety and depression symptoms in the context of life-stress : A prospective study. J Anxiety Disord 2011; 25:389-396. [CrossRef]

69. Papageorgiou C, Wells A. An empirical test of a clinical metacognitive model of rumination and depression. Cogn Ther Res 2003; 27:261-273. [CrossRef]