The purpose of this article is to present the current understanding of hair-pulling disorder and the proposed treatment of this disorder based on a cognitive behavior therapy model. The basic symptom of hair-pulling disorder, also known as trichotillomania, is a repetitive behavior, i.e. hair-pulling. It is a complex disorder both with respect to the diverse pattern of hair-pulling in particular individuals, as well as its occurrence at different stages of development. Hair-pulling disorder has been the subject of greater interest among clinicians and researchers since the 1990s. Therefore, it is an area in which only recently more scientific research and education of clinicians has been conducted. In more recent literature, there is a visible tendency to place hair-pulling disorder within the framework of a broader diagnostic category defined as body-focused repetitive behaviors. This term has just started to appear in reviews of the classifications of mental disorders. The cognitive behavior therapy for body-focused repetitive behaviors is the treatment of choice. The Comprehensive Behavioral Model developed by Charles S. Mansueto constitutes one of the main conceptualizations of the hair-pulling disorder in this therapeutic approach. Currently, it is necessary to continue studies on the efficacy of psychotherapy based on Mansueto’s model as well as other cognitive behavior programs intended for individuals with body-focused repetitive behaviors so that the patients can utilize helpful treatment options consistent with the standards of evidence-based psychotherapy.

Introduction – explanation of terms

Hair-pulling disorder (HPD) is a repetitive activity of pulling hair, resulting in their loss. This disorder is also called trichotillomania (TTM). Although the term TTM has been used by clinicians and scientists since the 19th century, it may cause false associations with mania and, therefore, mislead and stigmatize individuals pulling their hair, while the term HPD corresponds exclusively to the key behavioral aspect of the given disorder, without negative connotations [1].

The basic review of English scientific literature embracing this issue [1–3] points at a tendency to placing HPD within the master category of disorders described usually as body-focused repetitive behaviors (BFRBs), also called body-focused repetitive behavioral
disorders (BFRBDs). They describe repetitive behavioral body-focused patterns (hair, skin, nails, nose, lips, the interior of the oral cavity), going beyond the range of normal self-grooming behaviors, resulting in physical damages and significant distress or/and impairment in normal daily functioning. This general issue embraces behaviors such as pulling hair, excessive trimming, skin picking, nail biting, lip or cheek biting, etc. Different forms of BFRBs are frequently observed simultaneously or alternately in the same person [3].

Regular revisions of classifications of mental disorders according to DSM and ICD [4–7] join traditional and recent forms of categorization. Within DSM-5, HPD has been shifted to the diagnostic group Obsessive-compulsive and related disorders, OCRDs. A similar change is expected in the ICD-11 project. Within this group, HPD is presented as a distinguished subcategory, which means it has its own code. The name TTM is still preferred. At the same time, new terms HPD or BFRBDs are being introduced. Table 1 shows a detailed list of changes.

Table 1. Comparison of HPD (TTM) categorization in classifications DSM and ICD [4−7]

<table>
<thead>
<tr>
<th>DSM-IV-TR</th>
<th>DSM-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulse-control disorders not elsewhere classified</td>
<td>Obsessive-compulsive and related disorders</td>
</tr>
<tr>
<td>312.39 Trichotillomania</td>
<td>312.39 Trichotillomania (Hair-pulling disorder)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICD-10</th>
<th>ICD-11*</th>
</tr>
</thead>
<tbody>
<tr>
<td>F63 Habit and impulse disorders</td>
<td>Obsessive-compulsive or related disorders</td>
</tr>
<tr>
<td>F63.3 Trichotillomania</td>
<td>6B25 Body-focused repetitive behaviour disorders</td>
</tr>
<tr>
<td></td>
<td>6B25.0 Trichotillomania</td>
</tr>
</tbody>
</table>

*https://icd.who.int/browse11/l-m/en#/http%3a%2f%2fid.who.int%2ficd%2fentity%2f1121465374, access 2018-11-09

Hair-pulling disorder

Hair-pulling behavior occurs at various levels of development, from infancy to adulthood. It usually starts in early adolescence, between the 11th and 13th year of life. Individuals with this disorder do not pull their hair in the same manner. Each person has a specific behavioral pattern influenced by the period of development. The hair-pulling profile is different in each individual; additionally, it may change over time in the same person [2, 8].

In HPD, removing hair exceeds standard self-grooming behaviors such as depilation of the body. The loss of hair may range from insignificant to major, with removing almost all hair from a particular part of the body. In most cases, hair is pulled from the head but there are cases of pulling hair from eyebrows, eyelashes, and also from other hairy parts of the
Cognitive behavior therapy for hair-pulling disorder

body, including pubic hair. Pulling hair may be focused on one part of the body or more. The disorder considers a person’s own hair, although it happens that some individuals, usually children, pull the hair of other people or pets [3].

Beattie, Hezel, and Stewart [9] pointed at an easy to overlook the option of HPD that can be misdiagnosed. The authors described cases of children with loss of hair resulting from HPD of their mothers pulling their children’s hair. They called such a behavior by-proxy hair-pulling, trichotillomania-by-proxy. If the loss of hair in a child remains unknown, it is recommended to consider this form of HPD.

Hair pulling may be accompanied by trichophagia, it is chewing and swallowing hair, a problem observed mainly in females in their adolescence [3]. Hair is not digested, it sticks to the gastric mucus and gradually accumulates in the gastrointestinal tract forming a trichobezoar, a compact hair ball which is usually stuck in the stomach and can be of significant size. In certain individuals with trichophagia, the Rapunzel syndrome may be observed – in this case, the trichobezoar has a plait of hair, reaching the small intestine. The presence of a trichobezoar can be accompanied by discomfort or upper abdominal pain, a premature feeling of satiety, lessening of appetite, loss of body weight, nausea, vomiting, halitosis. These symptoms may not be observed for a longer period of time or last persistently. In the interview, the patient may not reveal the local hair loss, its partial loss or lack of growth. Surgical treatment may be necessary for evacuation of the trichobezoar whose attaching can be lethal [10]. Suspecting or stating trichophagia in a person with HPD is an indication for gastroenterological or surgical consultation.

When suspecting HPD, the psychotherapist should refer the patient for psychiatric and dermatological consultation before starting the therapy, in order to conduct differential diagnostics and make decisions concerning pharmacological treatment.

**Strategies of cognitive behavior therapy in hair-pulling disorder treatment**

The beginning of using cognitive behavior therapy (CBT) in HPD dates back to the 1970s, when the psychologists Nathan Azrin and Gregory Nunn [11] introduced the habit reversal training (HRT). In this time, pulling hair out was defined as an abnormal motor habit that could be lessened by learning to use an incompatible motor response. This approach to HPD was modified, suggestions for therapeutic treatment were extended. Presently, pulling hair is treated as a complex problem with its most visible behavioral component seen as one among several taken into consideration [2]. HPD psychological treatment programs in the CBT paradigm are based in particular on awareness training, stimulus control, competing
response training, cognitive restructuring and learning acceptance for the hair-pulling impulse [3, 12, 13].

The awareness training (AT) is used to enlarge self-awareness of hair-pulling episodes and recognize their individualized pattern by the individual with HPD, and also by the therapist. It is conducted from the beginning of the therapy by the patient’s records of the HPD problem in the Self-monitoring form. The proposed form sheets slightly vary in content, usually covering trigger situations of hair pulling, thoughts and emotions before hair pulling, hair-pulling behaviors, thoughts and emotions after hair pulling. The form content analysis enables further actions matching the pattern identified in the patient. Self-monitoring is continued because of changes in the hair-pulling profile along with implemented therapeutic interventions [3, 12, 13].

The stimulus control (SC) embraces the context in which the problematic behavior occurs. Through classical conditioning, the behavior of pulling hair is associated with external and internal trigger cues. For instance, easy access to implements used while pulling hair (mirror, tweezers) increases the probability of an HPD episode, along with the occurrence of characteristic thoughts. After identifying the character of the relations “trigger stimulus–hair pulling behavior” in AT, strategies aiming at modifying the influence of context signals are used in a way to limit exposition to trigger stimuli and to increase the presence of factors reducing such a behavior. An example of a ”speed bump” in episodes of pulling hair is replacing an illuminated mirror in the patient’s bathroom with a mirror without lights or limiting the time spent in the bathroom or in front of the mirror by the means of a timer. The acceptance of stimulus control methods is consulted with the patient and changes in the hair-pulling profile are monitored [3, 13].

The competing response training (CRT) includes learning to choose a behavior colliding with simultaneous hair pulling [3]. The reaction is introduced in the situation of an increased risk of pulling hair before it occurs. It may also be introduced after the beginning of the process of pulling hair and noticing this fact by the individual, which enables them to stop pulling hair. Competing responses vary in form. It is essential that they are easy to implement in everyday life, do not evoke unnecessary interest of other people and have been chosen by the HPD patient. These responses may include taking various objects (fidget/fiddle toy) into the hands to play with, such as a koosh ball, a tool for practicing hand muscles, own jewelry, e.g. a bracelet, or undertaking activities involving the hands other than pulling hair, e.g. embroidery, do-it-yourself. The response competing to hair pulling does not necessarily require holding any objects in the hands. It may be in the form of holding the hands in the
pockets, clenching fists, crossing arms on the chest. Other activities might be useful in trichophagia, such as chewing gum, shelling and eating nuts, etc. The individual with HPD chooses several responses that they use interchangeably, depending on the situation. The standard time of a single response is 3 minutes but depending on the need, it is adjusted, for example, it is shortened for children. In CRT, the overcorrection principle is used, which means prolonging the performed competing response, so that the patient can observe a decrease of the experienced discomfort, despite the lack of engagement in hair pulling [12, 13]. The result of the observation may be used in further analysis, during the cognitive restructuring.

The cognitive restructuring (CR) includes identification of negative automatic thoughts, dysfunctional intermediate beliefs, negative core beliefs, their verification, and successive modification. The cognitive contents of an individual with HPD may influence revealing and sustaining the problem, for example, “My hair must not look imperfect.”, "I have to pull it out, if I don’t do it, I cannot stand the tension.” [3, 13]. Therapeutic work is performed in the convention of a Socratic dialogue, according to the CBT principles described by Beck [14].

A more recent proposal in HPD treatment, based on acceptance and commitment therapy (ACT), is learning to accept the appearance of hair-pulling urge [3]. It is not synonymous with acceptance for pulling hair, but it means observing the occurrence, lasting and passing away of such an urge, despite the lack of a corresponding behavior. The acceptance aims to lessen the arousal felt when the impulse occurs, treated by the person with HPD as a benchmark of a necessary action in favor of choosing their behavior which can – but does not have to – be identical with the urge. Instead of suppressing the repetitive urge to pull hair, it is vital to recognize their own values in various areas of everyday life (e.g. relationships with people, education, professional development, leisure, and recreation) and to pursue them [15].

Using these basic therapeutic strategies in HPD depends on the identified patient’s hair pulling style [3, 16].

**Automatic and focused hair pulling**

Christenson and Mackenzie [17] divided hair pulling into two categories: automatic and focused, with the lack of or sustaining self-awareness of the behavior while acting respectively. These two categories determine the hair pulling style, which is useful while identifying the hair-pulling pattern. It simplifies the therapist’s choice of the treatment strategy adequate to the identified style of the patient.
**Automatic hair pulling** is a behavior going beyond the attention of the person with HPD, who does not notice the episode of pulling hair. They do not notice they have pulled hair until after the episode. It happens while the individual’s attention is pointed at a different object than the hair, usually during an activity demanding a sitting position for a longer period of time, e.g. while reading a book, watching TV, riding a car. It is more frequent in children and teenagers than adults. A therapeutic treatment based on awareness training, stimulus control and competing response training is recommended in the case of automatic hair pulling [3, 16].

**Focused hair pulling** is basically concentrated on this activity. From the very beginning of the episode, the individual is aware of pulling their hair out. It might be a planned action. This behavior usually takes place as a reaction to some emotional tension, anxiety, anger, sadness. Through pulling their hair, the individual with HPD gains temporary mitigation of unpleasant emotions as well as a gratification accompanying the hair pulling activity in shape of the feeling of pleasure. In this style, the hair pulling behavior is a manifestation of an emotional regulation mechanism, dysfunctional, resulting in positive reinforcements, which strengthen its continuation. The difficulty in regulation may refer to a certain kind of emotion which will likely accompany, in general, episodes of hair pulling. It is recommended to conduct a treatment that modifies experiencing and dealing with own emotions (other than pulling hair), it is cognitive restructuring and, moreover, work on the acceptance of the hair-pulling urge with engaging in discovering an individual value system and realization of objectives targeted by these values. Relaxation training is also being used [3, 16].

Usually, HPD individuals reveal both above-mentioned types of hair pulling styles, with one of them preferred, though, while the proportion may vary depending on trigger factors. Besides, the clinical picture of HPD, along with the intensity of automatic and focused hair pulling, may change with time [3, 13].

There are quite a number of useful methods in BFRBs diagnostics, including scales facilitating recognizing the intensity of both subcategories of hair pulling. Flessner et al. [18, 19] developed two tools describing the proportion of automatic and focused hair pulling. For children and adolescents, the **Milwaukee Inventory for Styles of Trichotillomania-Child Version** (MIST-C) is used, and for adults – the **Milwaukee Inventory for Subtypes of Trichotillomania-Adult Version** (MIST-A). MIST-C consists of 25 items, MIST-A consists of 15 items, to which the subject refers on the Likert scale. To the best of our (the authors’) knowledge, no Polish adaptation of the English methods of BFRBs psychological assessment
Cognitive behavior therapy for hair-pulling disorder

A. Antecedents of hair-pulling behaviors

was introduced until writing this article (November 2018), nor was any Polish tool published. Until the time of elaboration, for the sake of psychotherapy needs, the intensity of automatic vs. focused hair pulling can be shown by means of percentages or in a pie chart and referring to the appearance of these styles [14].

**Functional analysis in hair-pulling disorder**

The statement that somebody pulls their hair, apparently suggests one simple activity. In fact, it describes a sequence of behaviors, preceded by triggers and resulting in certain consequences, including the most obvious, which is the loss of hair. Because of this fact, in CBT-based treatment of HPD, it is not sufficient to state the existence of a problematic hair pulling behavior. The basis for further progressing through therapy is a detailed analysis of this behavior, taking into consideration its context and functions in a linear model: Antecedents–Behavior(s)–Consequences (ABC) [3, 20]. The ABC model in HPD is illustrated by Figure 1.

![Figure 1. The ABC model in hair-pulling disorder [3, 20]](image)

Using the ABC model, the American psychologist Charles S. Mansueto and colleagues [20, 21] presented an HPD diagnostically-therapeutic model, called *Comprehensive Behavioral Model*, in short, *ComB Model*. Mansueto’s model allows for a multidimensional conceptualization of the hair-pulling problem and an individualized choice of strategies of CBT treatment. It is one of the most important HPD treatment proposals, recommended by the TLC Foundation for Body-Focused Repetitive Behaviors (www.bfrb.org). The TLC Foundation for BFRBs is an organization operating in the US, the world leader in research-based seeking for efficient psychotherapy and pharmacotherapy for individuals with BFRBs and the world leader in transferring updated knowledge to patients, their families, and clinicians within this group of disorders [2].
Comprehensive Behavioral Model by Charles S. Mansueto and colleagues

In the Comprehensive Behavioral Model [2, 20–22], it is assumed that the complex characteristics of HPD is expressed by various hair-pulling patterns. The ComB Model-based psychological treatment consists of four stages. **Stage one** is a functional analysis of hair-pulling behavior. Antecedents of behavior, its sequences and consequences are recognized by the means of self-monitoring. In **phase two**, the identified functional components, mostly antecedents, and consequences, are organized in five modalities (domains): sensory, cognitive, affective, motor and environmental. They form the acronym SCAMP (Sensory, Cognitive, Affective, Motor, Place). The configuration of these modalities differentiates HPD individuals. These two phases allow understanding the functions of hair pulling, it is the needs it serves; therefore, they favor effective therapeutic intervention.

A. Antecedents of hair-pulling behavior [3, 20–22]

The number and sort of hair-pulling episode cues vary within individuals with HPD. Triggers are divided into external and internal.

A1. **External cues** concerning environment and activities:

1) **Environmental modality:**
   a) the environment of the individual:
      - home setting, e.g. own room, bathroom,
      - away-from-home setting, e.g. classroom, workplace, car;
   b) social environment:
      - presence or absence of people, potential observers,
      - presence of strangers vs. acquaintances, in particular relatives, family;
   c) tools used while pulling hair, e.g. tweezers, different mirrors: wall mirrors, hand mirrors, magnifying mirrors.

2) **Motoric modality:** various activities such as reading, learning, using the computer, watching TV, phone calls, face-caring treatment, putting on make-up, driving a car, going by car as a passenger, preparations to go to sleep, etc.

A2. **Internal cues**, corresponding to three other modalities:

1) **Sensory modality**, various bodily sensations, e.g.:
   a) visual sensations: the color of the hair, its structure, location;
   b) sensory sensations: a distinctive feature of the hair to touch, e.g. coarse, thickened or curly; sensations on the skin as itching, burning that may be the result of pulling hair.

2) **Cognitive modality:** negative automatic thoughts, dysfunctional beliefs, e.g. "I cannot have gray hair/hair unpleasant to touch.", "My hairline should be even, symmetric."
"I will pull out only several hairs.", "I have to look perfect."; cognitive contents may express a striving for reaching a specified, e.g. perfect, look.

3) **Affective modality**: broad scope of emotions, not necessarily negative, e.g. anxiety, sorrow, frustration, anger as well as boredom, excitement, satisfaction.

Signals from motoric and sensory modalities favor initiating automatic hair pulling, while signals from cognitive and affective modalities trigger focused hair-pulling.

**B. Hair-pulling behaviors with three-stage sequence [3, 20–22]**

After a trigger signal (signals), a pattern of hair-pulling behavior occurs which – being precise – consists of three stages: B1. preparatory behavior to pull hair out, B2. hair-pulling behavior (narrowly understood), B3. disposition behavior of the removed hair.

**B1. The preparatory behavior to pull hair out** is more distinctive in the focused than in the automatic style:

1) **Environmental modality**: access to an environment favoring hair pulling, e.g. own room with the absence of other people, proper equipment in place.

2) **Motoric modality**:
   a) activity aiming at being present in such an environment;
   b) directing one (left, right) or both hands to the certain part of the body and hair, touching it, putting fingers through the hair.

3) **Sensory modality**:
   a) visual search of hair in order to choose particular hair to pull out;
   b) tactile search of hair serving the same purpose.

**B2. Hair-pulling behavior** engages the **motoric modality**:

It is usually the dominant hand that is used to pull selected hairs out. The time spent on pulling out and the number of removed hair might vary between individuals and in the same individual. Intensive episodes may take hours, with hundreds of hairs being pulled out. This activity may be limited to one part of the body or dispersed over the body in several areas to avoid the loss of hair in one area, which would be visible to others.

**B3. Disposition behavior of the removed hair** takes on various forms:

1) **Motoric modality**:
   a) immediate disposal of the hair;
   b) different ways of manipulating the hair, such as biting, twirling;
   c) collecting the hair and its usage, e.g. for the purpose of subsequent stimulation of skin or lips.
2) **Sensory modality**, in particular:
   a) visual sensations connected with observing the extracted hair;
   b) tactile sensations, e.g. moving the hair between fingertips.

C. **Consequences of hair pulling [3, 20–22]**

Hair-pulling consequences are divided into two categories: reinforcing and aversive (punishing). Reinforcing consequences, enabling gaining a rapid gratification, contribute to maintaining episodes of hair pulling. Afterwards, there is place for aversive consequences that stimulate making intervals in choosing such a behavior. Among them, the major consequence is a different degree of hair loss, from thinning to a complete lack of hair in a specific area of the body.

C1. **Reinforcing consequences:**

1) **Environmental modality**: gaining the environment’s attention and interest, e.g. that of the parents; may form an essential sustaining factor for children and adolescents.

2) **Motoric modality**: engagement in pulling hair instead of other domestic, school, occupational, or social activities.

3) **Sensory modality**: increasing sensory stimulation meaning the feeling of invigoration, an ‘energy shot’ or lessening stimulation, e.g. the relief from itching.

4) **Cognitive modality**: reaching the aim corresponding to the concept of one’s own hair and appearance, distracting attention form unacceptable thoughts.

5) **Affective modality**: reducing excessive tension, relief, avoiding suffering unwanted emotions, feeling of satisfaction while pulling hair.

C2. **Aversive consequences:**

1) **Environmental modality**: surprise, disapprobation, criticism from other persons, e.g. relatives, while observing pulling hair or the results of such an activity. To avoid this, the person with HPD develops various behaviors which are used to cover the loss of hair. First of all, they tend to mask the loss under a proper hairdo or headband. They avoid visits at the hairdressers, doctors and, if such a visit takes place, they supply information suggesting other problems than the existing one – becoming bald instead of pulling hair. They avoid social contacts and sports or recreational activities.

2) **Motoric modality**: being tired after an intensive episode of hair pulling.

3) **Sensory modality**: pain in the place where hair was pulled out, skin damage, infection; pain in the neck, arms, back resulting from the long-lasting body posture while pulling hair out.
4) **Cognitive modality**: realizing the episode of pulling hair and its consequences.

5) **Affective modality**: shame, embarrassment, feeling of guilt, sadness, anger resulting from recurring hair pulling; the background for these emotions may be underrated self-esteem of the individual with HPD.

The third stage of the ComB Model is the choice of specific therapeutic strategies to the patient’s modality of the hair-pulling profile (the reasons that pulling hair serves) and using them for several weeks along with self-monitoring. The fourth phase is effectiveness evaluation of interventions, introducing changes, if necessary, e.g. replacing the previous strategy insufficient for the given person with a new one [20–22].

1) **Environmental modality**: stimulus control; contingency management (CM), such as rewards for using therapeutic strategies.

2) **Motoric modality**: awareness training; competing response training; response prevention (RP) from pulling hair during activities with a higher risk of revealing this behavior, e.g. plasters on fingertips, gloves on hands, hat on the head, wet or tied hair.

3) **Sensory modality**: reaction to satisfy the need for sensory stimulation, e.g. brushing the hair or body; dying hair; using a product that relieves head skin itching.

4) **Cognitive modality**: cognitive restructuring, learning acceptance for the hair-pulling impulse.

5) **Affective modality**: relaxation, pharmacotherapy (symptoms of depression, anxiety).

The ComB Model may be used in the treatment of individuals with other forms of BFRBs than HPD, e.g. skin-picking disorder (SPD) [2, 3].

**Efficacy of cognitive behavior therapy in hair-pulling disorder**

There is a shortcoming in researches on CBT efficacy in treating children, adolescents, and adults with HPD. To date, researches refer mostly to HRT (which includes AT, CRT, social support), meaning psychological treatment of BFRBs of the longest tradition [12]. The results point at the usefulness of HRT in a rather short-term improvement. Some follow-up assessments have found relapses of hair-pulling episodes in about 50% of cases after three months, with the percentage increasing in time, therefore, such episodes are quite likely in patients using only this training [3, 23]. The weak individualization of HRT may be a possible explanation because it does not take into consideration the specification of hair-pulling profiles, reflecting differentiated needs of BFRBs individuals. A therapeutic proposal aimed at individual needs by its modular structure is provided by the ComB Model. In clinical practice, it has been used since the 1990s, accepted by patients and therapists, and has reached
satisfactory treatment results [2, 24]. Presently, the first randomized controlled trial (RCT) of therapy efficacy based on this model is being performed under the direction of David A.F. Haaga from American University, planned for two years with 42 participants from the age of 18 (http://bfrb.org/blog/1-blog/366-new-treatment-study-american-university, access 2018-11-09).

Recapitulation

HPD is insufficiently understood by individuals with hair pulling disorder, their families, acquaintances, and also clinicians, and researchers. Therefore, there is a need of popularization of collected and updated knowledge on BFRBs as well as diagnostic and therapeutic procedures, especially recommended by the Scientific Advisory Board of the TLC Foundation for BFRBs. It is necessary to conduct researches on, amongst others, psychological and neurobiological aspects of BFRBs and also on the efficacy of therapeutic interventions, with a particular focus on RCTs as the highest standard evidence-based psychotherapy and evidence-based medicine. In Poland, Marta Gawłowska-Sawosz and colleagues [25] have undertaken the first trial to formulate guidelines for interdisciplinary diagnosis and treatment addressed to individuals with HPD.

References

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