Pica Disorder in Children and Adolescents

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Introduction/Definition

Pica is classified as a rare eating disorder where the individual has cravings to eat non-nutritive items on a regular basis (Dumas, 2013). These materials range widely, but are not limited to eating items like soil, clay, paper and hair (Dumas, 2013). Often, the pica object that the child craves, has a specific texture (Ashbury, 2006). These textures have been grouped under different "phagias" (Ashworth, 2006). Phagia is the name of the terminology that is attributed to these different types of cravings (Ashworth, 2006). For example, the craving of hair is called trichopagia, where the craving of sharp objects, is called acuphagia (see Table 1) (Stiegler, 2005). Pica can be seen in all stages of the lifespan, however, it occurs and is most frequently diagnosed in children (Dumas, 2013). With symptoms appearing between the ages of 1 and 6, pica tends to disappear in early adulthood (regular trajectory), making it a distinct childhood eating disorder (Ashworth, 2006). Unlike other eating disorders, pica is not very well understood, thus it remains overlooked and underdiagnosed (Cooper, 2011).

Table 1: Pica Terminology.

Phagia	Substance
Acuphagia	sharp objects
Amylophagia	laundry starch
Coprophagia	feces
Cautopyreiophagia	burnt matches
Foliophagia	leaves, grass
Geophagia	sand, clay, dirt
Lignophagia	wood, bark, twigs
Lithophagia	stones and pebbles
Pagophagia	ice, freezer frost
Plumbophagia	lead items
Tobaccophagia	cigarettes butts
Trichophagia	hair

Source: Stiegler, L.N. (2005). Understanding Pica Behavior: A Review for Clinical and Education Professionals. Focus on Autism and Other Developmental Disabilities, 20(1), 27.

The classification for the disorder can be found in both the International Classification of Disorders (ICD-10) and in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V). In order for someone to meet the diagnosis for pica they must present all of the following criteria as found in the DSM-IV-TR:

A. Persistent eating of nonnutritive substances for a period of at least 1 month.

B. The eating of nonnutritive substances is inappropriate to the developmental level.

C. The eating behavior is not part of a culturally sanctioned practice.

D. If the eating behavior occurs exclusively during the course of another mental disorder (e.g., Mental Retardation, Pervasive Developmental Disorder, Schizophrenia), it is sufficiently severe to warrant independent clinical attention.

With consideration to the DSM-V, little change is made except for criteria D, where there is the inclusion of pregnant women in the disorder criteria:

D. If the eating behavior occurs in the context of another mental disorder (e.g., intellectual disability [intellectual developmental disorder], autism spectrum disorder, schizophrenia) or medical condition (including pregnancy), it is sufficiently severe to warrant additional clinical attention.

In addition, the DSM-V classifies pica as a feeding and eating disorder that can occur at any age, whereas the DSM-IV-TR classifies pica as an eating disorder specific to children.

The tendency for a child to put non-food items (such as sand or toys) in their mouths before the age of 12 months, is developmentally accepted as it is reflective of a normal development period. However, the question of a pica diagnosis begins to arise when considering the age at which the child continues this behaviour outside the developmental bounds (Dumas, 2013).

Prevalence

Individuals suffering from pica are often reluctant to talk about and seek help for the disorder due to its stigma and the often concealing aspect of medical issues related to eating disorders (Cooper, 2011). In addition, healthcare providers do not typically ask patients about the occurrence of pica unless there is speculation to do so (for example, an obstruction in the stomach could lead the healthcare provider to ask about pica) (Cooper, 2011). For these reasons, the prevalence of pica is difficult to establish as it is remains underreported and underdiagnosed (Cooper, 2011).

Current research on pica shows that it is most often seen in children of low socioeconomic status (Rose, Porcerelli & Neale, 2000). It has a high comorbidity rate with children who have intellectual deficiencies (ID) (most often being autism), and individuals who are suffering from other mental health difficulties, such as schizophrenia and anorexia (Ashworth, 2006). In children, there is a prevalence of 1% - 15%, with the diagnosis most often taking place between the ages of 1 to 6 (Dumas, 2013). This

percentage rises to 25% for children who are institutionalized (Dumas, 2013). The disorder affects both male and female children equally (Dumas, 2013).

Intellectual Deficiencies

The prevalence of pica continues to increase to 35% for children with ID (Ashworth, 2006). As pica tends to subside with age (around adolescence), those with ID usually continue to show pica behaviour well into adulthood (Ashworth, 2006). As such, pica, alongside obesity, becomes the most commonly diagnosed eating disorder among those with ID (Ashworth, 2006). In addition, pica is more often seen in male children with ID, with a ratio of 1.3:1 to 2:1, with diagnosis occurring later, between the ages of 9 to 14 (Ashworth, 2006).

Culture

Significant changes in the prevalence of pica are seen when consideration is given to cultural factors. Pica is most often reported in countries such as Africa and India, with an occurrence rate of 60%, most often seen in female children and young adults (Watcham, Schön, & Christianson, 2007). In these countries, geophagia is the most commonly reported form of pica (Young, 2011). This form of pica involves the eating of earth, soil or clay (Young, 2011). For them, pica is a widespread social practice and is not considered an eating disorder (Young, 2011).

Etiology/Risk Factors

Observations of pica have been documented throughout history, making it a disorder that is not new (Ashbury, 2006). For example, in the antiquity period, Hippocrates documented that he thought geophagia was associated with a blood problem

(Ashbury, 2006). Although pica has been known for centuries, little is known about its etiology (Ashbury, 2006). Formal research into pica did not commence until the beginning of the 19th century, where individuals who experienced pica were labelled as unintelligent (Ashbury, 2006). It is often seen as a mystery illness, with no genetic findings, making it hard to pinpoint its exact causation (Sturmey & Williams, 2016). For this reason, the explanation of pica comes from a variety of different approaches, these include: nutritional, cultural, developmental, psychological, physiological and sociological. As such, it remains important to highlight risk factors associated with the disorder.

Nutritional Deficiency

Pica may start to manifest in children who have a nutritional deficiency (Cooper, 2011). In some cases, the pica craving exhibited by the child, is a craving that reflects the vitamin or mineral that they are lacking (Cooper, 2011). More specifically, in minerals, such as iron and zinc (Cooper, 2011). Although this explanation is offered, the direction of the causal relationship between iron deficiency and pica is unclear and should not be a considered a credible explanation of the cause (Ashbury, 2006).

Cultural Differentiation

Cultural markings have also been tied to explaining the etiology of pica. A study conducted by medical doctors Woywodt and Kiss, observed that children and young adults who engage in geophagia pica, believe that eating soil will improve the colour of their skin, thus making them more attractive (2002). They also observed that for young women, geophagia also holds the belief that eating soil will maintain and elevate healthy

fertility and reproductive organs (2002). They note that geophagia may also be the result of low socioeconomic status, with the pica behaviour taking place in order to satisfy hunger (2002). However, more often than not, it is observed in a cultural context (Bhatia & Kaur, 2014).

It is equally important to recognize that the presence of geophagia in these cultures, is more a learned behaviour, rather than a craving (Woywodt & Kiss, 2002). The learned behaviour coming from their own personal beliefs regarding geophagia. Additionally, as three quarters of women practice geophagia in Kenya, the stigma associated with pica is not the same as is in developed countries, but is rather seen as socially and culturally appropriate (Woywodt & Kiss, 2002). As a result, geophagia is so well accepted in these countries, that many individuals may find it odd not to practice this type of eating behaviour.

Intellectual Disabilities and Autism

In children with intellectual disabilities, pica is seen as a result of either a non-discriminating oral behaviour, thus the inability to tell the difference between an edible and a non edible item; or as a result of emotional and sensorial deprivation (Sturmey & Williams, 2016). For example, in autistic children it is observed that they are either over or under-reactive to stimulation (Sturmey & Williams, 2016). Thus, in the latter case, such need for stimulation may result in the participation of pica behaviour. As is observed, children with autism who demonstrate pica often participate in acuphagia pica (the ingestion of sharp objects) (Ashworth, 2006). This points to the idea that sensory disturbances are the cause of pica occurrences (Sturmey & Williams, 2016).

Mental Illness

Pica disorder may also be the secondary result of a primary mental health disorder, the two most common being anorexia nervosa and schizophrenia (Lask & Bryant-Waugh, 2000).

Anorexia is an eating disorder defined as the obsession to lose weight by refusing food (Dumas, 2013). As such, individuals who have this disorder may participate in pica behaviour in order to feel full without having to ingest the calories that are found in food (Lask & Bryant-Waugh, 2000). Research notes that individuals who have this comorbid disorder often consume cotton wool in order to satisfy hunger (McLoughlin & Hassanyeh, 1990)

Research into patients with schizophrenia and pica disorder remains relatively understudied. Youssef, Amad, Lalau & Gwenole, noted that pica eating is often the result of the delusions experienced in schizophrenic patients (2014). As such, most schizophrenia patients with pica demonstrated coprophagia, the eating of feces; and potomania, the drinking of beverages in large quantities (Youssef et al., 2014).

Low Socioeconomic Status and Environmental Risk Factors

Low socioeconomic status (SES) and environmental factors also play an important role in the risk factors associated with pica. In children who experience malnutrition and hunger, the participation in pica behaviour may serve as a way to satisfy hunger (Cooper & Stein, 2006). In addition, lack of parental attention and supervision plays a role, as children may engage in pica in order to receive attention or because they are curious about the substance (Cooper & Stein, 2006). As a result, a habit is developed

in the form of reinforcement, as the ingestion of the substance allows them to receive attention (Cooper & Stein, 2006). In children with low SES, the ingestion of paint and paint chips is the most common form of pica (Cooper & Stein, 2006).

Children may also engage in pica as a reaction to stress. Stress can take the form of child abuse, maternal distancing, neglect etc. In these cases, as the child is not often aware of coping mechanisms, pica is seen as a developed coping mechanism in dealing with stress (Cooper & Stein, 2006).

As the exact etiology of pica is unknown, it is important to adopt a multifactorial approach to understanding the disorder. As is shown, pica involves the intersection of various causes to explain its etiology. As such, researchers will often consider this when performing further research into its causation. It is also important to note that for some, pica is a learned behaviour, thus, having someone that is close to the child also practice pica may predispose the child to pick up on this behaviour (Cooper & Stein, 2006).

Evaluation

If pica is suspected, the diagnose should involve both the involvement of a medical doctor and a clinical psychologist. To begin, it is important for the caregivers of the child to conduct an at home evaluation of the disorder. This evaluation should take the form of an eating journal, where a daily logging of all food and non-food items should be written for a period of one month (Grillo & Mitchell, 2010). In keeping with this journal, the discrimination between food and non-food items should become apparent, and the presence of pica or poly pica (eating more than one non-nutritive substance) should be easy to identify (Tyrer & Silk, 2008). The food journal will also aid

in identifying any causation for observed nutritional deficiencies. In addition, it is also important to record where incidences of pica take place (Grillo & Mitchell, 2010). For example, if pica is occurring at home, or if it is occurring at school or both. Furthermore, it should also hold regard for certain stressors that may be causing the pica behaviour (Grillo & Mitchell, 2010). For example, if the pica is only taking place when the child feels stress before going to school. However, if the child's unusual eating habits are hidden and there is only suspicion of the disorder, then a method called "baiting" may be suitable (Carter et al., 2004). In this method, the use of a pica stimulus is used to identify the source of reinforcement (Carter et al., 2004). For example, in a child who faces neglect or abuse, pica, by way of eating paint, may be a way for them to receive attention.

In conjunction with keeping the eating journal, the caregiver should also seek the professional opinion of a physician. In order to properly evaluate if the individual is suffering from pica, the physician should conduct a full medical and physical assessment (Carter et al., 2004). The eating journal will serve as a method to evaluate the eating habits of the patient, in terms of the length of time that pica has been occurring; the non-food item that is frequently ingested; as well as any stressors and environmental causes.

The physical assessment will involve the physician conducting a test to check for any visible obstructions to the abdomen. For example, if pica has been occurring for a long period of time, it may be possible to observe a surface obstruction on the patient (Carter et al., 2004). This would manifest itself as a large, often hard bump, due to the amalgamation of the non-food item (Carter et al., 2004). The physician should also ask

about any bowel problems, such as constipation, as this will provide evidence to any gastro intestinal tract manifestations, caused by the ingestion of indigestible materials (Carter et al., 2004).

Because of the nature of pica, findings and physical examinations vary widely, as symptoms are usually associated directly with the ingested item (Carter et al., 2004). Thus, it is equally important to conduct x-rays and blood tests to test for the possibility of nutritional deficiencies, further obstructions and any toxic substances that may occur as a result (Tabacc & Tabacc, 2013). For example, lead poisoning is the most common form of poisoning associated with pica among children (Cooper, 2011). Furthermore, most children with lead poisoning are asymptomatic with symptoms being nonspecific and subtle, thus stressing the importance of running a blood test (Cooper, 2011). X-rays are also highly recommended as they help to screen for any obstructions that may not be visible on the surface of the patient (Rose, Porcerelli & Neale, 2000). For example, obstructions can occur in the lungs or in the gastrointestinal tract.

Further evaluation should also be conducted by mental health professional, such as a psychologist. A pica diagnosis is not easy to come by, as it often relies on the child revealing that they have pica (Cooper, 2011). However, unless the child deliberately tells the doctor that they are suffering from pica, they often continue to suffer in silence for fear of judgment (Rose et al., 2000). Thus, interfering with proper diagnosis. A psychologist is thus recommended as they are able to further evaluate the disorder by talking to the patient about it with a non-judgmental and therapeutic approach, making the patient feel more comfortable (Rose et al., 2000). Mental health professionals are also

more specialized in training and in dealing with disorders such as pica, thus offering a different approach than a physician. The psychologist may also opt for an evaluation questionnaire to be filled out by both the child and the primary caregivers of the child (Ashbury, 2006). This evaluation should include questions relating both indirectly and directly to pica, evaluating both the pica behaviour, the child's environment and any stressors that the child may be experiencing (Ashbury, 2006).

In the evaluation by a mental health professional, it is also important to determine if there is presence of other another disorders that may be causing pica symptoms (Ashbury, 2006). If this is the case, a differential diagnosis should be established. For example, they may be able to determine that the individual is suffering from anorexia and thus engages in pica in order to fulfill feelings of hunger without the ingestion of nutrients (Lask & Bryant-Waugh, 2000). Additionally, in children who have autism, schizophrenia and other physical disorders, pica is seen as a secondary problem caused by the primary problem and thus is often noted as an additional diagnosis (Sturmey & Williams, 2016).

Therefore, in evaluating the presence of pica it is important to involve both a medical doctor, as well as a psychologist. The medical doctor is able to determine and test for any medical ailments, such as obstructions, toxicity and nutritional deficiencies, providing empirical evidence for the disorder; whereas the mental health professional is able to accurately diagnosis and establish the presence of pica as either the primary disorder or the secondary disorder. Furthermore, they are able to identify if its comorbid

with any other medical conditions and/or if the disorder is caused by the environment or stress in the child's life.

Treatment

The treatment for pica varies widely, as it is dependent on a multitude of factors. A multidisciplinary approach involving physicians and psychologists is the most recommended. The treatment plan must take into considerations all experienced pica symptoms as well as all contributing factors, while treating the child's case of pica as its own individual case. With this, treatment can be decided in the form of either nutritional treatment, behavioural therapy, psychosocial interventions, pharmacologic treatment and/or the treatment of other disorders.

Nutritional Treatment

For some, the treatment of pica is as simple as treating the determined nutritional deficiency. After the physician has looked over the blood test, and it has been determined, for example, that the child is suffering from a low amount of iron, then the physician may prescribe iron supplements (Cooper, 2011). It must be kept in mind, however, that nutritional approaches have only seen a limited amount of success in treating pica (Ashbury, 2006). Often, nutritional deficiencies are not a cause of pica, but are rather a symptom (Ashbury, 2006). Nonetheless, nutritional treatment remains important in the overall health and wellbeing of the child.

Psychosocial Interventions

The psychosocial intervention of pica involves the correction of the child's social and immediate environment. In some children, treatment may be as simple as the removal

of the item known to cause the observed pica behaviour (Carter et al., 2004). For example, in children who eat paint, the simple removal of paint from the environment may prove to be effective. Caregivers may also opt to place locks where pica objects are found, or moving the pica objects to a location unknown to the child (Carter et al., 2004).

If it is determined that the child engages in pica as a result of neglect or abuse, then the caregivers should be made aware that this is why the child has pica (Tyrer & Silk, 2008). This will allow them to understand the behaviour and create a safe social environment for the child, thus correcting the way they direct themselves towards the child. If this proves to be inefficient, then putting the child in a new environment where these factors are not a problem, is recommended in order for successful improvement to manifest.

Caregivers are also encouraged to create a "pica box" (Hirsch & Myles, 1996). This a box that contains specific items that are deemed safe for the child to ingest. The use of this box ensures that only safe items are used during pica manifestations, thus reducing the amount of risks involved in ingesting other items (Hirsch & Myles, 1996). In order for this box to effective, it is important that the items found are similar to the texture of the child's usual pica object (Hirsh & Myles, 1996). Gradually, the caregiver can make the pica box less available to the child (Hirsh & Myles, 1996). This will aid in reducing or minimizing the pica behaviour, with the eventual goal of erasing pica completely.

Behavioural Therapy

The use of behavioural therapy proves to be the most effective form of treatment for children suffering from pica, with mild aversion therapy being the most utilized (Grilo & Mitchell, 2010). The goal of this therapy is to reduce or eliminate the undesired behaviour. In aversion therapy for pica, the child is presented with an aversive stimulus. For example, an aversive smell, such as ammonia. This smell is then presented to the child while they are engaging in the pica behaviour. Other aversive techniques may be used as well, such as administering the child lemon juice, or spritzing the child with water mist. As a result, the child becomes conditioned to associate pica with the negative stimulus, thus reducing and/or eliminating the pica behaviour (Grilo & Mitchell, 2010).

Pharmacologic Therapy

Although there is no specific drug that is used to treat pica, recent research has shown that drugs used to treat obsessional-compulsive disorder may be effective in treating pica in children (Bhatia & Gupta, 2009). The most used being selective serotonin reuptake inhibitors (SSRIs), such as Zoloft and Prozac. Reasoning for this being an effective method of treatment remains unknown, however, researchers are tying it to the idea that pica may not be the result of an eating disorder, but is rather an OCD spectrum disorder (this will be further discussed in controversies) (Bhatia & Gupta, 2009). In OCD, SSRIs work to elevate serotonin levels in the individual, thus decreasing obsessive and compulsive behaviour (Bhatia & Gupta, 2009). Studies are pointing to the idea that the same pattern is true in pica, thus making SSRIs effective (Bhatia & Gupta, 2009). However, the long term effects of SSRI's in treating children with pica is widely

understudied. As such, behavioural therapy should always be considered as the first option for treatment (Bhatia & Gupta, 2009).

Treatment Considerations (Culture and Other Disorders)

Special consideration should be given when treating pica in individuals who hold cultural beliefs surrounding the disorder. It is important to recognize that for them, pica is not a disorder, but is rather a culturally accepted practice. As such, it is important to first educate the caregivers of these children of the potential health consequences of pica (Young, 2011).

It is equally important to recognize the presence of any underlying disorders when creating treatment plans for pica, as pica may be a symptom of another disorder (Lask & Bryant-Waught, 2000). For example, in children and adolescents who suffer from anorexia, pica behaviour may be observed as a way for them to curve feelings of hunger (by eating objects that do not contain any nutrients) (Lask & Bryant-Waught, 2000). As a result, treating pica as the primary problem in these children, would be ineffective.

While the treatment for pica ranges widely, it is first important to understand why the child is manifesting pica behaviour. This will allow for the construction of individual treatment plans to be effective. In most cases, pica is best treated with a combination of nutritional supplements and mild aversion therapy (Rose et al., 2000). Children should also meet regularly with a mental health professional in order to evaluate progress that is being made in the disorder. This will allow for treatment plans to be adjusted as required (Rose et al., 2000). Lastly, it is always more effective to treat pica in early childhood, rather than later in the child's developmental period (Dumas, 2013).

Controversy 1

It should be noted that the two controversies presented below are based on pica of the behavioural type and involving nutritional deficiencies. They do not consider pica as a result of an intellectual deficiency or pica that is culturally sanctioned.

One of the main controversies surrounding pica is related to its classification and definition in the DSM-IV and V. In these manuals, pica is classified as a feeding and eating disorder occurring in infancy and early childhood; however, recent research points towards the idea that the classification of pica should be on the same spectrum as an obsessive-compulsive disorder (OCD) (Bhatia & Gupta, 2009). This remains a controversy when considering further investigation into appropriate treatments for pica and uncovering its etiology (which remains widely understudied and unknown).

OCD is an anxiety disorder where the individual repeatedly performs routines and/or actions to relieve anxiety (Bhatia & Gupta, 2009). Researchers Hergüner, Ozyildirim & Tanidir studied pica in a ten-year-old boy, in the same scope as an OCD disorder (2008). The subject had pica cravings to eat fiber like substances, such as carpet. Researchers noticed that pica may aid in relieving anxiety in the patient (Hergüner et al., 2008). They further observed that the effort made to resist pica behaviour, only elevated the child's level of anxiety, which was then relieved the consumption of the fibers (Hergüner et al., 2008). This observed behaviour follows the same cycle as OCD (see Figure 2).

As is shown, the individual begins

with obsessive thoughts related to the

behaviour (Dumas, 2013). In pica, the individual begins to to have obsessive thoughts about eating the non-food item. As the thoughts continue, anxiety starts to take place (Dumas, 2013). This is the stage where the individual's anxiety increasingly rises, and begins to feel the need to act in order to rid the discomfort (Dumas, 2013). Following anxiety, the compulsive behaviour takes place (Dumas, 2013). This is manifested by the individual engaging in the activity by which they were having obsessive thoughts and anxiety (Dumas, 2013). In pica, this is the stage where the individual will take place in the compulsive behaviour of eating their pica object in order to settle their level of anxiety. The final stage of OCD, is marked by the individual experiencing relief from their anxiety (Dumas, 2013). However, this relief is temporary, with the obsession only reinforced, leaving the individual to continue this outlined cycle of OCD (Dumas, 2013). In pica, this leaves the individual to continue to partake in pica eating behaviour. Thus, the OCD cycle mirrors the exact cycle of pica, only further supporting the argument that pica should be considered on the OCD spectrum (Luiselli, 1996).

Hergüner & Al., discovered that the main evidence for considering pica on the OCD spectrum lies in its treatment. While realizing that pica coincidently mirrors the same behaviours as OCD, researchers decided to treat pica using the same methods used to treat OCD. This method involved the administration of selective serotonin reuptake inhibitor (SSRI). SSRI's alleviate the feeling of anxiety, by increasing serotonin levels in the brain. Prozac (Fluoxetine), was the SSRI drug given to the participant in the research study, and is the most commonly prescribed SSRI drug to treat OCD. The results of the research showed pica intensity to be reduced within six weeks, with the administration of

medication being ceased at nine months after the study had taken place. In the follow up, researchers noted that the child did not present any pica related symptoms, with the disorder ceasing entirely. Researchers attributed this to the "anti-anxiety and anti-obsessive properties" of the drug, which is exactly what is treated when treating OCD.

Although recent studies have provided evidence in support of considering pica on the same spectrum as OCD, controversy remains. A solution for the problem, is to continue researching pica as if it belonged to the same family as OCD. This would advance further findings on the disorder and strengthen the argument surrounding its definition and classification. In addition, further studies should be conducted into SSRIs on the treatment of pica, perhaps looking into the effectiveness of other SSRIs and creating a drug that specifically targets the behaviours seen in pica.

As pica involves the compulsive eating of non-nutritive items, it makes sense that it would be classified as an eating disorder; however, as further studies reveal that pica shares many similarities with OCD, the argument becomes more congruent with that of OCD classification. What's more is that the ICD-10 already considers pica as a behaviour problem, rather an eating disorder. Pica is a disorder that has been known for centuries, however, no one has been able to pinpoint its etiology. I believe that this provides further evidence that pica should be continued to be researched using the same approach as OCD. Perhaps researchers have been looking at pica from the wrong angle. Rather than beginning their research into studying the etiology of pica, it may be important to begin

the research in the treatment of pica by observing similar features amongst other disorders (OCD), and thus adopting a backwards approach.

Controversy 2

A second controversy surrounding pica remains in its etiology. Some researchers question whether or not pica is actually the result of a mineral deficiency, or if the mineral deficiency is a result of pica (Ashbury, 2006). This remains controversial as this is most commonly used explanation for why pica occurs, and questioning whether or not this is true, fundamentally discredits all known causes of pica. Thus, without this main theory to explain pica, researchers are essentially left with no explanation, other than a psychosocial approach.

Pica has been observed and studied to usually occur in those with nutritional deficiencies, however, most studies show little or no causation (Ashbury, 2006). While it is suggested that the item craved by the child contains the mineral that they are lacking, the pica object does not usually contain that mineral, nor does it help in correcting to elevate the mineral's levels in the child's body (Sturmey & Williams, 2016). Overall, research and physical exams have shown more correlation in the evidence that pica causes nutritional deficiencies, rather than nutritional deficiencies causing pica (Sturmey & Williams, 2016). In addition, there has been much more success in linking pica as a result of a learned behaviour, or in the correlation between pica and OCD.

In providing a solution for this controversy, it is important that researchers and educated professionals remain aware of the newfound causes of pica and stay up to date with current knowledge on the eating disorder (Sturmey & Williams, 2016). Research

into this subject area continues to move forward and remaining aware of its advancements is key. While there is a vast number of information out there that supports nutritional deficiencies as an explanation, it is important to rely on concrete scientific evidence, thus turning to peer-reviewed articles and academically sourced material.

This controversy poses as a danger to the disorder, as it provides a false explanation for its etiology. Relying on this as an explanation, may cause other studies to not be encouraged. As such, if there is a theory explaining pica, then why look further? In addition, this does not aid advancements in the treatment of pica, as if pica were as simple as treating the nutritional deficiency, then why should it remain important to encourage behavioural therapy or conduct further research into possible pharmacological treatments? Thus, in order for pica to be effectively treated, health care professionals and academics need to stay informed on its advancements, especially those who treat the disorder directly.

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*pica box

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