PRZEGLĄD PSYCHOLOGICZNY, 2018, TOM 61, Nr 4, 507–521

Systemic determinants of eating behaviour in families with an obese child

Agnieszka Pasztak-Opiłka[a*], Jagoda Sikora[a]
Agnieszka Zachurzok[b]

[a]*University of Silesia in Katowice*
Institute of Psychology, Faculty of Pedagogy and Psychology
[b]*Medical University of Silesia, Katowice*
Department of Paediatrics and Paediatric Endocrinology
School of Medicine

Overweight and obesity are essential health problems of today's children. The aim of the present paper is to propose a model of systemic determinants of eating behaviour, inspired by the Mandala of Health by Hancock and Perkins and based on the Circumplex Model by Olson and the concept of parenting styles by Baumrind. In addition to the child's temperamental features, parenting styles and characteristics of the family system consistent with the Circumplex Model (i.e. the level of cohesion and flexibility in the family and satisfaction with family life and with mutual communication) are regarded as the most important variables in the model that influence child's eating behaviour. A significant role is also played by perceptions of the child's obesity, parental obesity, family lifestyle and influence of other family members. The importance of the socioeconomic status and the influence of the external environment on the functioning of the family system is emphasised.

Key words: eating behaviour; family; obese child; determinants of obesity.

INTRODUCTION

The World Health Organisation (WHO, 2015) has recognised childhood overweight and obesity as an epidemic. According to the data by the International Association for the Study of Obesity (2011) excessive weight is diagnosed in 12.4% of girls and 16.3% of boys in Poland. Adolescent obesity is associated

* Address for correspondence: Agnieszka Pasztak-Opiłka—University of Silesia in Katowice, Institute of Psychology, Faculty of Pedagogy and Psychology, ul. Grażyńskiego 53, 40–126 Katowice, Poland; e-mail: agnieszka.pasztak@us.edu.pl

with a 17.5 times higher risk of adult obesity, which means that over 80% of obese adolescents will keep following incorrect eating habits and become obese adults. In families with two obese parents, children have a 70% chance of being obese, while children whose parents' weight is within the normal range, have an only 10% risk of obesity. Childhood obesity can lead to metabolic sequelae: carbohydrate and lipid disorders, insulin resistance, and ultimately, type 2 diabetes and cardiovascular diseases (August et al., 2008; Moore, Wilkie, & Desrochers, 2016). In the process of emergence of obesity, epigenetic and environmental factors overlap with genetic predispositions. The basic patterns of eating behaviour, which are considered the main cause of childhood obesity, are acquired through intergenerational transmission. A family with incorrect eating habits, living in an environment that provides (or limits) access to healthy food, medical care and conditions for physical activity, is a part of the concept of obesogenic environment (Swinburn, Egger, & Raza, 1999), characterised by excessive consumption and a sedentary lifestyle.

Eating behaviours

Eating behaviours aimed at satisfying nutritional needs during socialising interactions take the form of habits. They include activities related to planning what food to buy and shopping for food and the conditions in which meals are eaten. Goryńska-Goldmann and Ratajczak (2010) also count among eating habits monitoring of the nutritional value of products, shelf-life dates and storage conditions, decisions on the number of products stored at home, and cooking techniques. Cultural customs and beliefs about obesity have an indisputable influence on these practices (Moore et al., 2016).

Unhealthy eating behaviours include undiversified meals, skipping breakfasts, eating irregularly, eating in fast-food restaurants, eating when not hungry as a result of increased sensitivity to external signals about food, evening hyperphagia, and eating at night (Gowey et al., 2016). In a study by Pasztak-Opiłka (2016), 89% of children diagnosed with obesity were fed irregularly and consumed products forbidden by the dietitian (mainly sweets) and 87% ate more than the recommended number of five daily servings, out of which 56% concealed this fact from their parents. Every third child regularly resigned from eating breakfast or ate at night when the other household members were asleep. Similar results were obtained by Cichecka-Wilk (2013), who additionally found that 97% of obese teenagers ate between meals, and almost all the obese children examined by her ate meals while watching TV, doing homework or playing computer games.

GOAL

The aim of this paper is to introduce a multidimensional model of the determinants of eating behaviours in families with an obese child and to present its theoretical underpinnings and the empirical research on which the hypotheses included in the model were built. There are many reports in the literature regarding various aspects of childhood obesity. However, there is

no synthetic approach that would provide a consistent understanding of the phenomenon, while considering the characteristics of the family system and the external factors affecting it, combined with the child's individual nutritional preferences.

THEORETICAL ASSUMPTIONS

The model proposed in the article, inspired by Hancock and Perkins's Mandala of Health (1985) is based on two key theoretical concepts: the Olson Circumplex Model (2000) and the concept of parenting styles by Baumrind (1966, 1991).

The Mandala of Health presented by the Department of Public Health in Toronto, in the understanding of its creators, is a symbol of the universe. An individual understood holistically, as a unity of the body, intellect and the soul is located in the centre of the mandala. The family is the sphere located closest to the individual, while the culture and the biosphere are the most distant. Other determinants of health include, among others, the physical and socioeconomic environments, the healthcare system, and lifestyle. Although various publications in the field of health psychology, in referring to this concept, stress different dimensions of the mandala, from the perspective of the model we present in this article, it is worth emphasising that its creators, in their original conception, put particularly strong emphasis on the importance of the family, placing it in the immediate vicinity of the individual (Hancock & Perkins, 1985). The family not only teaches the child to health, but also shapes his/her health habits. In addition, it mediates and often acts as a buffer in the relations between the individual and the environment in which he/she lives (Hancock & Perkins, 1985; Słońska, 1994).

The model presented here is based on Olson's (2000) Circumplex Model, which distinguishes two basic dimensions that characterise the family: cohesion and flexibility, and a third dimension—communication. Flexibility is understood as the amount of change in the family system, affecting the norms and roles undertaken by its members, including the issues of leadership. Cohesion defines emotional closeness between family members and the possibility of seeking autonomy in relationships. Moderate levels of flexibility and cohesion ensure the most beneficial functioning of families. Too low flexibility is defined as rigidity and too high as chaos. Too low cohesion is disengagement and too high is enmeshment. Communication is an auxiliary dimension, but the efficiency of communication in the family system and the possibility of making changes in terms of cohesion and flexibility depend on it.

Baumrind's proposal includes four basic parenting styles: permissive, authoritarian, democratic (authoritative), and rejecting-uninvolved. The permissive style is associated with liberal parenting based on love, the need to understand the children behaviour, and to limit the control and demands placed on them. The authoritarian style requires obedience and is characterised by rigid and consistent boundaries set by the parent, often with the use of force. The democratic style is characterised by clearly defined boundaries and con-

trol, but the parents react sensitively to the children's needs by showing them warmth. The rejecting-uninvolved style is characteristic parents who do not give support, do not respond to their children's needs and engage in behaviours that lead to neglecting parental responsibilities or rejecting the child. The parenting styles proposed by Baumrind have been fitted by Olson and Gorall (2006) into their circumplex model, which links the democratic style with moderate levels of cohesion and flexibility, the authoritarian style—with rigidity and enmeshment, the permissive style with chaos and enmeshment, and the rejecting-uninvolved style with disengagement, chaos and rigidity.

A MODEL OF DETERMINANTS OF EATING BEHAVIOUR IN A FAMILY WITH AN OBESE CHILD

Based on these concepts and empirical data, Pasztak-Opiłka has built a model of determinants of eating behaviour (dependent variable) in a family with an obese child, which covers two basic areas: the family system and the physical, social and cultural background of its functioning (Fig. 1). In the sphere related to the family, special attention should be paid to the relationships between the child, parents and other family members, whose actions may shape eating behaviours. Parenting styles and the subjective assessment of the characteristics of the family system (cohesion, flexibility, communication and satisfaction with its functioning) are considered to be the most important variables on the parents' side. Perception of the child obesity, parental obesity and lifestyle (diet and physical activity) also play a key role in creating eating behaviours which may ultimately contribute to obesity. On the child's side, the most important variables are: temperament, assessment of parenting styles and subjective assessment of the family system. Perceptions of the child's own obesity and lifestyle also play a role here. For other members of the family (mainly grandparents involved in the family's daily life), the most important variables are perceptions of the child's obesity and lifestyle. Eating behaviours also depend on the socioeconomic context of family life, which consists of professional activity, education and the related level of income, which allows the family to both pursue physical activity and satisfy nutritional needs at various levels. In the external environment, a special role is played by medical care, conditions conducive to pursuing physical activity, social support, and cultural influences.

The model is based on the following basic hypotheses:

1. Assessment of the family system, and parenting styles shape eating behaviours in the family.

2. Obesity of family members and perceptions of the child obesity play an important role in shaping and changing eating behaviours.

3. The child's eating behaviours are regulated by internal factors (i.e. temperamental traits) and external ones (e.g. parental eating behaviours and the environmental characteristics in which the family functions).

4. Eating behaviour is affected by the socioeconomic status of the family and its consequences.

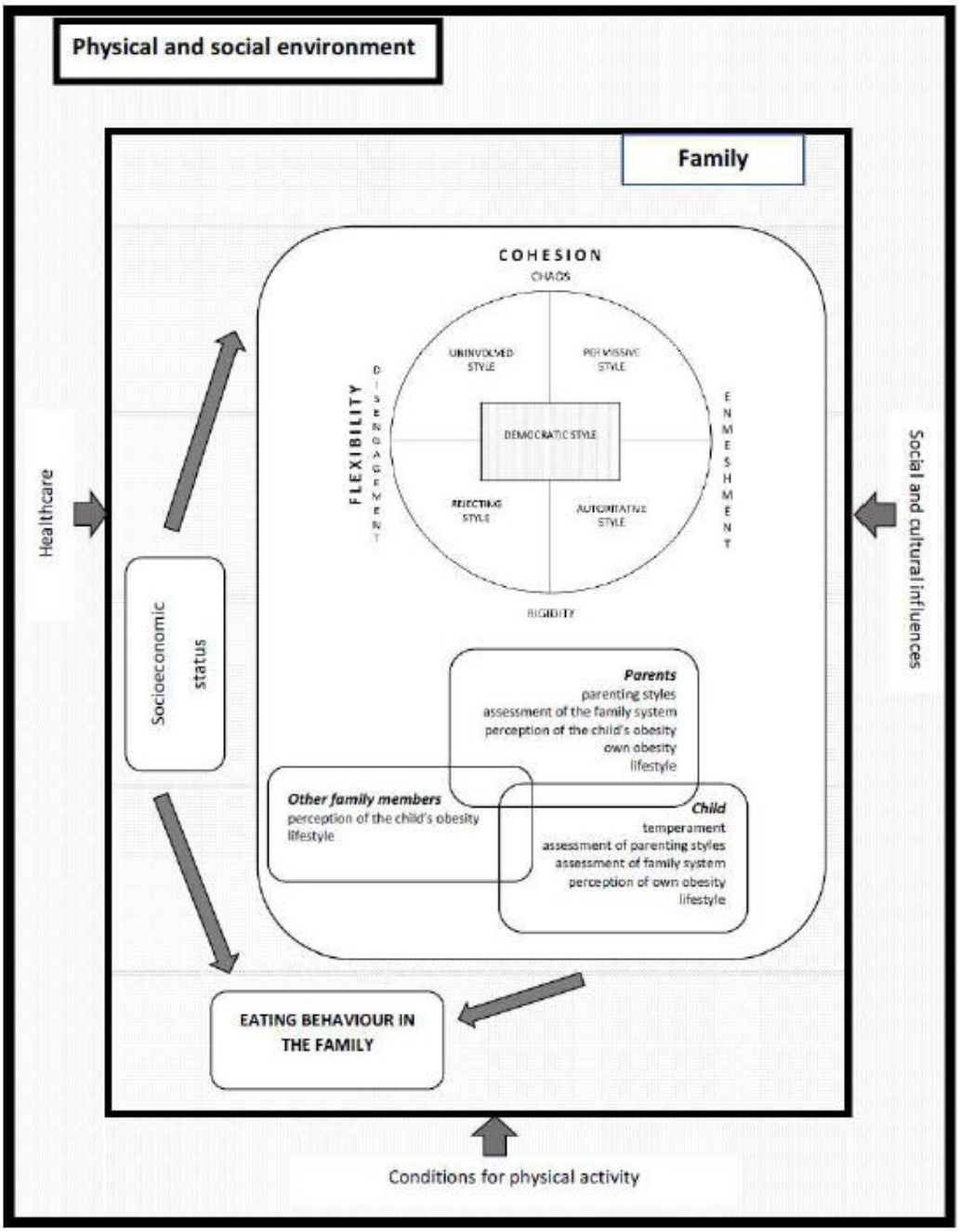

Figure 1. A model of determinants of eating behaviour in a family: A. Pasztak-Opiłka (with elements adopted from Olson and Gorall, 2006).

A REVIEW OF STUDIES JUSTIFYING THE HYPOTHESES ASSUMED IN THE MODEL

The influence of parenting styles and the assessment of the family system on eating behaviours in the family

The parenting style that parents implement through demands, parental control, setting boundaries and respecting them, shapes children's eating behaviours. Children of parents who use the authoritarian style are at an even four times greater risk of excessive body weight compared to their normal-weight peers (Yavus & Selcuk, 2018). In children of permissive and neglecting mothers, the risk of a body mass index (BMI) $\geq 95^{th}$ percentile is twice as high as in children of democratic mothers (Rhee, Lumeng, Appugliese, Kaciroti, & Bradley, 2006). Olvera and Power (2009) and Rutledge (2003) emphasise that the risk of excessive body weight in children of permissive mothers increases when the latter have a higher socioeconomic status and are professionally active. Because such mothers spend less time at home, the child can experience loneliness and neglect, and soothe these states with overeating. Emotional eating is much less common in the children of parents who use the democratic style, providing support and understanding and devoting more time to their children. This style is most beneficial in the prevention of obesity (Darling & Steinberg, 1993; Kitzman-Ulrich et al., 2010).

Blisset and Haycraft (2008) have analysed the relationship between feeding practices and parenting styles in pre-school children. They have distinguished three feeding styles: (1) monitoring of unhealthy meals consumed by children, (2) restricting food and using it as a reward, and (3) applying pressure to eat certain dishes, often against the child's will. The permissive style is associated with lower monitoring of unhealthy food intake, which hinders the treatment of obesity and impairs self-regulation.

Not only parenting styles, but also the characteristics of the family system affect eating behaviours. The formation of healthy behaviours is favoured by moderate levels of cohesion and flexibility, proper communication and satisfaction with family life (Mróz & Kaleta, 2013). However, as the level of cohesion increases, eating behaviours become more and more susceptible to stimulation by external factors in difficult situations (Hasenboehler, Munsch, Meyer, Kappler, & Vögele, 2009). This can be explained by Olson's curvilinear hypothesis that overly high levels of cohesion or flexibility are dysfunctional—enmeshment weakens the child's self-regulating ability in terms of feeling hunger and promotes eating in response to external stimuli. The importance of cohesion has also been studied by Frontini, Canavarro and Moreira (2017), who have found that higher levels of cohesion in teenagers boost their body image and the level of social interactions and are associated with a lower level of internalising symptoms. A cohesive family gives a sense of security and has a positive impact on family relationships, thanks to which children can disclose their fears or shame resulting from obesity. It has been found that the

relationship between cohesion and internalising symptoms is indirect, and is mediated by one's body image and social interactions.

Studies by Nascimento and colleagues (2015) aimed at assessing parents' perceptions of the quality of life of their children have revealed that parents of overweight and obese children report difficulties in their children's physical functioning, low self-esteem, but also a lower level of family cohesion. There are, however, differences in the assessment of families and perception of communication and parenting styles between children and parents (Cyril, Halliday, Green, & Renzaho, 2016). Children are more likely to signal disturbances in the functioning of the system and less likely to evaluate the parenting style as democratic. Disturbed communication between family members and a high level of family conflicts are particularly important. Adolescents who did not follow intervention recommendations were more likely to negatively assess the functioning of their family, family relations and the support received from their parents in the treatment process. Lower self-efficacy and lower assessment of the quality of life were observed in this group, and every third teenager did not see the need for any intervention (Tabak, Oblacińska, & Jodkowska, 2014).

The importance of obesity in family members and relatives' perceptions of the child's obesity

The most important predictor of child obesity is maternal obesity, as the mother is the main caregiver, who spends a lot of time with the child and strongly affects his/her eating behaviours (Gibson et al., 2007). Obesity in parents also affects their perception of the child obesity and involvement in the process of treatment, including their readiness to change unhealthy eating behaviours. Influenced by cultural stereotypes, almost half of the parents of overweight and obese children fail to see the problem and associate excessive weight with health and a "cute" look (Guo et al., 2012). Parents downplay the child weight, thinking that the child "will grow out of it," which results from the lack of solid knowledge, excessive faith in the importance of genetic background, and the commonness of obesity, which is becoming a social norm (Moore et al., 2016). In a study by Bradford et al. (2012), as many as 86% of parents of obese children and 53% of parents of overweight children believed their child weight was within the norm or was too low. Eli, Howell, Fisher and Nowicka (2017), who examined the parents of children between 3 and 5 years of age and grandparents who were actively involved in their daily lives, did not observe intergenerational differences in incorrect perceptions of obesity. It turned out that the perceptions were not affected by the awareness and correct understanding of growth (centile) charts. The respondents were aware of the health-related and social consequences of obesity, but assumed that the problem became important only at the school age. Their descriptions of the children's appearance featured caressing and positive terms, such as: chubby, massive, sturdy, robust or big-boned. But the problem of underestimating the weight does not only apply to families with young children. In a study (Manios

et al., 2015) conducted in nine European countries, almost half of the children who were overweight and obese and one third of the parents underreported weight, a tendency that was particularly strong in Eastern and Southern Europe. The adults who were most likely to underreport their children weight were unemployed and were the parents of boys and overweight and obese children. In the case of children, parental obesity, child age (younger children), and parental unemployment favoured underestimation of their weight.

The impact of children's temperamental traits and parental eating behaviours

The tendency to develop specific eating behaviours is already observed in the first years of life and is influenced by temperamental traits. Irritability manifested in infancy is associated with an increased intake of carbohydrates at a later age (Wells et al., 1997). High levels of emotionality and shyness correlate with the reluctance to try new dishes (Pliner & Loewen, 1997). In impulsive children, emotional eating is more often observed in response to external stimuli (Farrow, 2012). The ability to regulate the amount of consumed meals based on internal hunger signals is congenital (Fox, Denavey, Reidy, Razafindrakoto, & Ziegler, 2006), but as part of socialisation, children are gradually sensitised to signals from the external environment, such as the smell and appearance of food or rituals associated with eating. Parents' eating behaviours have a significant impact on the children's diet and body weight. Hood et al. (2000) point to an increased risk of obesity in the children of parents who impose excessive diet restrictions, who have no control over their own diet, and who show dietary disinhibition or who alternately apply both strategies. Children, modelling their parents' behaviour, do not acquire proper eating patterns, and a particularly strong effect is observed when disturbed eating patterns occur in both parents. As a result, the child natural responsiveness to hunger and satiety may wane in favour of external regulation, which promotes obesity.

The impact of the family's socio-economic status on family lifestyle

Obesity mostly affects environments with a lower socioeconomic status and poorer access to medical care (WHO, 2015). Importantly, in developing countries, it mainly affects higher social strata and is associated with excessive consumption of calories; conversely, in developed countries, obesity is common among lower social classes, which results from economic restrictions on access to healthy food and the possibility of engaging in physical activity (Van Hook & Balistreri, 2007). An important factor is the mother's education: better educated mothers are more likely to acquire knowledge about healthy and unhealthy eating behaviours and pass it on to their children (Keane, Layte, Harrington, Kearney, & Perry, 2012). The family structure is also important. Children raised by a single parent or living in a small family (up to 3 members) run an increased risk of obesity (Guo et al., 2012). More and more par-

ents bring up a child alone or establish new families, and according to the assumptions of systemic theories, each change in the family structure translates into a change in its functioning, causing changes in eating habits and becoming a source of stress (Hernandez, Pressler, Dorius, & Mitchell, 2014).

The amount of time parents spend with their child and the way they spend it depends on the socioeconomic status of the family. The importance of joint physical activity and the level of cognitive stimulation provided by the parents is emphasised. Only 42% of early school age children get one hour of daily activity, and this percentage drops drastically during puberty to 8% (Troiano et al., 2008). According to Mutz and Albrecht (2017), the children of parents with higher education and with better incomes are more active. Those researchers have identified four mechanisms which motivate children to engage in physical activity: (1) parent's physical activity which the child can imitate, (2) encouraging the child to participate in sports activities and accompanying the child in those activities, (3) providing conditions for being active (purchasing sports equipment and using sports facilities), and (4) treating sport as a value conducive to the development of personality and building social relations. For Strauss and Knight (1999), a key factor in the development of obesity is the level of cognitive stimulation, which is derivative of the socioeconomic status. In families where the stimulation is low or at a medium level, the risk of obesity is twice as high as in families with a high level of stimulation.

DISCUSSION AND CONCLUSIONS

The research results presented above confirm the validity of the hypotheses on which the model discussed in this paper is based.

1. Parenting styles and the characteristics of the family system shape eating behaviours in the family:

—Obesity is seen more often in children of parents who use the authoritative, permissive or rejecting-uninvolved style; the democratic style proves to be the most favourable for prevention of obesity and for developing healthy eating habits.

—Moderate levels of cohesion and flexibility, good communication and a high level of satisfaction with family life are conducive to shaping proper eating behaviours.

2. Obesity of family members and perceptions of the child obesity affect his/her eating behaviours.

—Maternal obesity is particularly important. It is a strong predictor of childhood obesity, and additionally the mother has the strongest influence on shaping the child's eating behaviours.

—Obese parents tend to perceive their children as weighing less than they really do and so downplay the problem, which makes it difficult to undertake effective intervention and change the unhealthy eating behaviours in the family.

—The knowledge of growth charts and reliable knowledge about obesity do not always go hand in hand with perceiving the problem at home.

3. The impact of the child's temperamental traits and parental eating behaviours.

—The child's temperamental traits (e.g. impulsiveness, irritability, high level of emotionality) foster the development of unhealthy eating behaviours and obesity at a later age.

—Parents' improper eating behaviours (dietary disinhibition, diet restrictions, lack of dietary self-control) favour the development of improper eating behaviours in children.

4. The family's socioeconomic status significantly affects its lifestyle and eating behaviours.

—The development of correct eating habits in the child is fostered by higher education of the parents, higher income, family structure (e.g. full family), more time devoted by parents to their children, parents' healthy lifestyle (proper diet and physical activity).

The model presented in this paper concerns the development of eating behaviours. However, in the light of the spreading obesity epidemic, it is also worth going a step further to consider which of the variables included in the model are particularly important at the intervention stage. Undoubtedly, such variables include the characteristics of the family system, included in the circumplex model. Uzark, Becker, Dielman, Rocchini and Katch (1988) have distinguished five barriers that impede effective intervention: (1) sense of personal control over weight, (2) perceived obstacles to weight loss, (3) health problems that cause obesity, (4) family problems, and (5) the readiness of other family members to follow a diet with their child. Disturbances in the functioning of the system will hinder the implementation of effective intervention at its various stages. Firstly, the shaping of new, healthy eating behaviours requires that all family members change their diet (Moore et al., 2016), which can be difficult to achieve in dysfunctional families, especially those with impaired communication. A study by Pasztak-Opiłka (2016) revealed that in 89% of families of children requiring intervention, dietary recommendations were implemented only with reference to the child, and the banned products were consumed by the close relatives in presence or unhealthy food was generally available at home (even though obesity also affected 75% of the parents!). In every third family, adults behaved inconsistently, with one parent adhering to the dietary recommendations, while the other parent or grandparents fed the child with banned products in secret. This behaviour is in a way explained by a study conducted by Boutelle, Feldman and Naumark-Sztainer (2012), who distinguished four barriers to treatment related to the relationship between a teenager and a parent: (1) ineffective communication, (2) lack of control over teen decisions regarding eating behaviour and physical activity, (3) concern for the good mood of the child, and (4) parental feelings of guilt associated with the development of obesity. Parents are afraid of emotional lability, especially during conversations about obesity, which could irritate and hurt the child. Concern about the offspring's good mood strongly

shapes the mutual relations, and it is experienced mainly by parents who themselves have been struggling with obesity during adolescence and want to protect their child from negative experiences. Parents report a sense of helplessness when it comes to influencing the teenager's decisions and the inability to react when he/she is out of home. They stress the importance of support given to the child, especially during periods of frustration, when the young person does not lose weight despite following the diet, taking the recommended physical activity, and making other, related sacrifices. Schalkwijk and others (2015) have come to similar conclusions, emphasising the environmental aspects of the problem (the outer layers of the model presented here) and adding that what is important for children is social support from peers, which strengthens their motivation and helps them in treatment. Parents strongly emphasise the role of the primary care physician at all stages of treatment and also after its completion. The support received from other family members who are actively involved in the functioning of the family on a day-to-day basis is significant to them. As it turns out, situations that traditionally require that specific dishes be served (e.g. receiving guests) and lack of support from other family members (mainly grandparents who show their feelings by giving banned products to the child) are often an obstacle in the treatment of childhood obesity. Parents follow the recommendations better when they have experienced the negative consequences of their own obesity, or when they receive signals that the child is stigmatized in the peer environment. In highlighting the importance of the functioning of the family system, researchers also stress that one of the main differences between families who struggle with obesity and those that do not is the parental sense of control over the child's diet. A child with a correct body weight asks the parents for permission to eat a product, a child who is overweight informs the parents that he/she will eat it, while a child with obesity eats it secretly (Rodrigez, 2016).

The presented model is currently being tested empirically in a group of children treated in the Outpatient Clinic of Metabolic Diseases of the Upper Silesian Children's Health Centre in Katowice and their parents, as part of the project "Assessment of the mental status of obese children and adolescents and their families," implemented under a scientific and research cooperation agreement between the University of Silesia and the Medical University of Silesia in Katowice. On its basis, a tool for the assessment of eating habits in the family has been developed, which is currently undergoing validation. The tested model and the tool created on the basis of its assumptions are designed to systematically acquire knowledge about the functioning of families of obese children and adolescents and, in the long run, to contribute to building a model of effective intervention. The proposed model is intended to allow a coherent evaluation of obese children and their families against the background of the characteristics of the family system and the external factors that affect it in combination with the children's individual nutritional preferences.

REFERENCES

August, G. P., Caprio, S., Fennoy, I., Freemark, M., Kaufman, F. R., Lustig, R. H., & Montori, V. M. (2008). Prevention and treatment of paediatric obesity: An endocrine society clinical practice guideline based on expert opinion. *The Journal of Clinical Endocrinology Metabolism, 93*(12), 4576–4599.

Baumrind, D. (1966). Effects of authoritative parental control on child behaviour. *Child Development, 37*(4), 887–907.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance abuse. *Journal of Early Adolescence, 11*(1), 56–95.

Blissett, J., & Haycraft, E. (2008). Are parenting style and controlling feeding practices related? *Appetite, 50*(2), 477–485.

Boutelle, K. N., Feldman, S., & Neumark-Sztainer, D. (2012). Parenting an overweight or obese teen: Issues and advice from parents. *Journal of Nutrition Education and Behavior, 44*(6), 500–506.

Bradford, K., Kihlstrom, M., Pointer, I., Skinner, A. C., Slivka, P., & Perrin, E. M. (2012). Parental attitudes toward obesity and overweight screening and communication for hospitalized children. *Hospital Pediatrics, 2*(3), 126–132.

Cichecka-Wilk, M. (2015). Zachowania żywieniowe dzieci z otyłością prostą w świetle wyników badań własnych. *Lubelski Rocznik Pedagogiczny, 32*, 243–275.

Cyril, S., Halliday, J., Green, J., & Renzaho, A. M. N. (2016). Relationship between body mass index and family functioning, family communication, family type and parenting style among African migrant parents and children in Victoria, Australia: A parent-child dyad study. *BMC Public Health, 16*, 707.

Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin, 113*(3), 487–496.

Eli, K., Howell, K., Fisher, P. A., & Nowicka, P. (2014). "A little on the heavy side": A qualitative analysis of parents' and grandparents' perceptions of preschoolers' body weights. *BMJ Open, 4*(12), 006609.

Farrow, C. V. (2012). Do parental feeding practices moderate the relationships between impulsivity and eating in children? *Eating Behaviors, 13*(2), 150–153.

Fox, M. K., Devaney, B., Reidy, K., Razafindrakoto, C., & Ziegler, P. (2006). Relationship between portion size and energy intake among infants and toddlers: Evidence of self-regulation. *Journal of the American Dietetic Association, 106*(1), 77–83.

Frontini, R., Canavarro, M. C., & Moreira, H. (2017). Family cohesion and psychopathological symptoms in paediatric obesity: Is there an indirect effect? *Children's Health Care, 47*(1), 101–117.

Gibson, L. Y., Byrne, S. M., Davis, E. A., Blair, E., Jacoby, P., & Zubrick, S. R. (2007). The role of family and maternal factors in childhood obesity. *Medical Journal of Australia, 186*(11), 591–595.

Goryńska-Goldmann, E., & Ratajczak, P. (2010). Świadomość żywieniowa a zachowania żywieniowe konsumentów. *Journal of Agribusiness and Rural Development, 4*(18), 41–48.

Gowey, M. A., Reiter-Purtill, J., Becnel, J., Peugh, J., Mitchell, J. E., & Zeller, M. H., TeenView Study Group (2016). Weight-related correlates of psychological dysregulation in adolescent and young adult (AYA) females with severe obesity. *Appetite, 99*, 211–218.

Guo, X., Zheng, L., Li, Y., Yu, S., Sun, G., Yang, H., & Sun, Y. (2012). Differences in lifestyle behaviors, dietary habits, and familial factors among normal-weight, overweight, and obese Chinese children and adolescents. *International Journal of Behavioral Nutrition and Physical Activity, 9*, 120.

Hancock, T., & Perkins, F. (1985). The Mandala of Health: A conceptual model and teaching tool. *Health Education, 24*, 8–10.

Hasenboehler, K., Munsch, S., Meyer, A. H., Kappler, C., & Vögele, C. (2009). Family structure, body mass index and eating behavior. *International Journal of Eating Disorders, 42*(4), 332–338.

Hernandez, D. C., Pressler, E., Dorius, C., & Mitchell, K. S. (2014). Does family instability make girls fat? Gender differences between instability and weight. *Journal of Marriage & Family, 76*(1), 175–190.

Hood, M. Y., Moore, L. L., Sundarajan-Ramamurti, A., Singer, M., Cupples, L. A., & Ellison, R. C. (2000). Parental eating attitudes and the development of obesity in children. The Framingham Children's Study. *International Journal of Obesity, 24*(10), 1319–1325.

International Association for the Study of Obesity (2011). Downloaded from: http://www.oecd-ilibrary.org/sites/health_glance-2011-en/02/04/index.html?contentType=itemId=%2Fcontent%2Fchapter%2Fhealth_glance-2011-19-enmimeType=text2FhtmlcontainerItemId=%2Fcontent%2Fserial%2F19991312accessItemIds.

Keane, E., Layte, R., Harrington, J., Kearney, P. M., & Perry, I. J. (2012). Measured parental weight status and familial socio-economic status correlates with childhood overweight and obesity at age 9. *PloS One, 7*(8), e43503.

Kitzman-Ulrich, H., Wilson, D. K., George, S. M. S., Lawman, H., Segal, M., & Fairchild, A. (2010). The integration of a family systems approach for understanding youth obesity, physical activity, and dietary programs. *Clinical Child and Family Psychology Review, 13*(3), 231–253.

Manios, Y., Moschonis, G., Karatzi, K., Androutsos, O., Chinapaw, M., . . ., & Brug, J. (2015). Large proportions of overweight and obese children, as well as their parents, underestimate children's weight status across Europe. The ENERGYproject. *Public Health Nutrition, 18*(12), 2183–2190.

Moore, E. S., Wilkie, W. L., & Desrochers, D. M. (2016). All in the family? Parental roles in the epidemic of childhood obesity. *Journal of Consumer Research, 43*(5), 824–859.

Mróz, J., & Kaleta, K. (2013). Struktura relacji w rodzinie pochodzenia a zachowania prozdrowotne dorosłych. *Problemy Higieny i Epidemiologii, 94*(2), 239–246.

Mutz, M., & Albrecht, P. (2017). Parents' social status and children's daily physical activity: The role of familial socialization and support. *Journal of Child and Family Studies, 26*(11), 3026–3035.

Nascimento, M. M. R., Melo, T. R., Pinto, R. M. C., Morales, N. M. O., Mendonça, T. M. S., Paro, H. B. M. D. S., & Silva, C. H. M. (2015). Parents' perception of health-related

quality of life in children and adolescents with excess weight. *Journal de Pediatria, 92*(1), 65–72.

Olson, D. H. (2000). Circumplex Model of marital and family systems. *Journal of Family Therapy, 22*(2), 144–167.

Olson, D. H., & Gorall, D. M. (2006). *Faces IV and the Circumplex Model*. Saint Paul, MN: Life Innovations, Inc.

Olvera, N., & Power, T. G. (2009). Brief report: Parenting styles and obesity in Mexican American children. A longitudinal study. *Journal of Pediatric Psychology, 35*(3), 243–249.

Pasztak-Opiłka, A. (2016). Psychospołeczne wymiary otyłości u dzieci i młodzieży a możliwość skutecznej interwencji. [In:] *Konferencja Naukowa „Otyłość wieku rozwojowego. Od przyczyn do konsekwencji. Rola chirurgii bariatrycznej w leczeniu otyłości", Katowice, 19–20.09.2016.*

Pliner, P., & Loewen, E. R. (1997). Temperament and food neophobia in children and their mothers. *Appetite, 28*(3), 239–254.

Rhee, K. E., Lumeng, J. C., Appugliese, D. P., Kaciroti, N., & Bradley, R. H. (2006). Parenting styles and overweight status in first grade. *Pediatrics, 117*(6), 2047–2054.

Rodríguez, C. C., Chávez, L. E. O., Serrano, M. D. L. P., Cabrera, T. D. J. V., Solis, M. G. O., González, M. Á., & de León, J. C. B. (2016). Children and parents' perceptions of family functioning relating to childhood obesity. *Advances in Applied Sociology, 6*(10), 330–343.

Rutledge, J. M. (2003). *Parenting style differences in overweight versus non-overweight children and the potential moderating effects of socioeconomic status and ethnicity*. Downloaded from: http://citeseerx.ist.psu.edu/viewdoc/download?

Schalkwijk, A. A. H., Bot, S. D. M., de Vries, L., Westerman, M. J., Nijpels, G., & Elders, P. J. M. (2015). Perspectives of obese children and their parents on lifestyle behavior change: A qualitative study. *International Journal of Behavioral Nutrition and Physical Activity, 12*(1), 102.

Słońska, Z. (1994). Promocja zdrowia – zarys problematyki. *Promocja Zdrowia. Nauki Społeczne i Medycyna, 1*(1–2), 37–52.

Strauss, R. S., & Knight, J. (1999). Influence of the home environment on the development of obesity in children. *Pediatrics, 103*(6), 1–8.

Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*(6), 563–570.

Tabak, I., Oblacińska, A., & Jodkowska, M. (2014). Psychospołeczne czynniki sprzyjające stosowaniu diety przez nastolatków z nadmiarem masy ciała. *Medycyna Ogólna i Nauki o Zdrowiu, 20*(2), 120–125.

Troiano, R. P., Berrigan, D., Dodd, K. W., Mâsse, L. C., Tilert, T., & McDowell, M. (2008). Physical activity in the United States measured by accelerometer. *Medicine and Science in Sports and Exercise, 40*(1), 181–188.

Uzark, K. C., Becker, M. H., Dielman, T. E., Rocchini, A. P., Katch, V. (1988). Perceptions held by obese children and their parents: Implications for weight control intervention. *Health Education Quarterly, 15*(2), 185–198.

Van Hook, J., & Balistreri, K. S. (2007). Immigrant generation, socioeconomic status, and economic development of countries of origin: A longitudinal study of body mass index among children. *Social Science Medicine, 65*(5), 976–989.

Wells, J. C., Stanley, M., Laidlaw, A. S., Day, J. M., Stafford, M., & Davies, P. S. (1997). Investigation of the relationship between infant temperament and later body composition. *International Journal of Obesity, 21*(5), 400–406.

WHO. World Health Organization (2015). Downloaded from: http://www.who.int/end-childhood-obesity/commission-ending-childhood-obesity-interim-report.pdf.

Yavuz, H. M., & Selcuk, B. (2018). Predictors of obesity and overweight in preschoolers: The role of parenting styles and feeding practices. *Appetite, 120*, 491–499.