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EATING HABITS OF PATIENTS WITH CLEFT LIP AND PALATE TREATED WITH FIXED APPLIANCES

NAWYKI ŻYWIENIOWE U PACJENTÓW Z ROZSZCZPEM WARGI I PODNIEBIENIA LECZONYCH APARATAMI STAŁYMI

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Abstract

Introduction: Health education, built on the basis of various models as a lifelong process, has a considerable impact on eating habits. Correct nutritional patterns are particularly important during the period of intense growth and adolescence. The need to observe dietary recommendations concerns healthy, as well as sick persons, especially those with chronic diseases. To-date the data on the dietary habits of patients with cleft lip and palate during orthodontic treatment have been scarce.

Objective of the study: The objective of the study was to determine the eating habits of patients with cleft lip and palate before and during orthodontic treatment with a fixed appliance.

Material and method: The study covered 125 patients with cleft lip and palate, aged 14 to 31. The research tool was an own questionnaire assessing the dietary behaviour and oral hygiene habits during the treatment with a fixed orthodontic appliance.

Results: In the course of the orthodontic treatment with a fixed appliance, 79 patients (57.6%) did not change their eating patterns and 32 patients (24%) changed them to a moderate degree. The mean of 53 patients (42.7%) changed their hygienic habits considerably. The number of meals remained the same, however in the period when patients suffered pain after orthodontic adjustment appointments, the number of persons having 4-5 meals a day decreased by 32%. It is worth considering that no statistically significant changes were recorded as regards the habit of having sweet snacks and the insufficient consumption of fruit and vegetables. Difficulties with correct oral hygiene were reported after the consumption of e.g. spinach (59.8%), cucumber (57.6%), berries (54.4%), meat (58.2%).

Conclusions: Eating habits of a considerable percentage of patients with a cleft defect, before or during the treatment with a fixed appliance, do not comply with healthy nutrition recommendations. The dietary education of patients undergoing orthodontic treatment is necessary to ensure proper oral health and prevent diet-related illnesses.

Key words: eating habits, cleft lip and palate, orthodontic treatment with a fixed appliance

Streszczenie

Wstęp: Znaczący wpływ na zachowania żywieniowe, ma edukacja zdrowotna, modelowana przez całe życie pod wpływem różnych wzorców. Prawidłowe żywienie ma szczególne znaczenie w okresie intensywnego wzrastania i dojrzewania. Przestrzegania zaleceń żywieniowych dotyczy zarówno osób zdrowych, jak i chorych zwłaszcza przewlekle. Dotychczas mało jest udokumentowanych danych dotyczących żywienia pacjentów z rozszczepem wargi i podniebienia podczas leczenia ortodontycznego.

Cel pracy: Celem pracy było ustalenie nawyków żywieniowych u pacjentów rozszczepem wargi i podniebienia w okresie przed i w trakcie leczenia ortodontycznego aparatem stałym.

Materiał i metoda: Badaniem objęto 125 pacjentów z wadą: rozszczepem wargi i podniebienia, w wieku 14-31 lat. Narzędziem badawczym był autorski kwestionariusz oceniający zachowania żywieniowe oraz nawyki higieniczne z obrębie jamy ustnej, w czasie prowadzonego leczenia aparatem stałym ortodontycznym.

Wyniki: Podczas leczenia ortodontycznego aparatem stałym 79 pacjentów (57,6%) nie zmieniło nawyków żywieniowych, a 32 osób (24%) zmieniło w stopniu średnim. Nawyki higieniczne w dużym stopniu zmieniło średnio 53 pacjentów (42,7%). Liczba spożywanego posiłków nie uległa zmianie, jednak w okresie wystąpienia objawów bólu po ortodontycznych wizytach kontrolnych obserwowano spadek o 32% liczby pacjentów spożywających 4-5 posiłków dziennie. Na uwagę zasługuje fakt, pojadanie słodkich przekąsek, zbyt niskie spożycie owoców, warzyw, przed i w trakcie leczenia ortodontycznego nie uległo statystycznie istotnym zmianom. Trudności z utrzymaniem prawidłowej higieny jamy ustnej powoduje m.in. spożywanie szpinaku (59,8%), ogórka (57,6%), owoców drobnopestkowych (54,4%), mięsa (58,2%).

Wnioski: Nawyki żywieniowe znacznego odsetka pacjentów z wadą rozszczepową przed i w trakcie leczenia aparatem stałym odbiegają od zasad prawidłowego żywienia. Niezbędną jest edukacja żywieniowa pacjentów leczonych ortodontycznie w celu zapewnienia zdrowia jamy ustnej oraz występowania schorzeń dietozależnych.

Słowa kluczowe: nawyki żywieniowe, rozszczep wargi i podniebienia, leczenie ortodontyczne aparatem stałym

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INTRODUCTION

The 60th World Health Assembly, held on 23 May 2007, declared that the good state of the oral cavity is one of the important determinants of the general health condition and quality of life. Therefore, it is vital to focus on oral health, especially on the prevention, early diagnosis and treatment of chronic diseases (1). The proper nutrition of children and adolescents contributes to their correct physical and intellectual development, as well as their health in adult life. It also has a substantial impact on oral health (2) and may influence the effectiveness and stability of the outcomes of orthodontic treatment.

The available literature does not provide any data on the dietary habits of patients with a craniofacial cleft. Neither are there studies determining whether a fixed orthodontic appliance changes eating patterns.

The objective of the study is to answer the question if the eating habits of patients with cleft lip and palate change during the orthodontic therapy with a fixed appliance.

MATERIAL AND METHODS

A one-off questionnaire was held among 125 patients with cleft lip and palate, aged 14 to 31 (82 persons below the age of 18 and 43 persons over the age of 18), of both sexes (55 women and 70 men). The study was held in clinics in three province capitals (Warsaw, Wrocław and Poznań). Every clinic received 100 questionnaires with a request to distribute them

among randomly selected patients with cleft lip and palate treated orthodontically with a fixed appliance, if possible equally among both sexes. The study was approved by the Bioethical Commission at the Poznań University of Medical Sciences (consent no. 330/11). Patients responded to the following questions: "How many meals do/did you eat daily (including main meals and snacks): before /during the treatment/ when you feel pain symptoms? How many times a week do/did you eat: fruit, vegetables, milk and dairy products, fish, white and wholemeal bread before/ during the treatment? How often do/ did you eat snacks (sweet, savoury, dry and fresh fruit, raw vegetables) before/ during the treatment?" Patients also defined how often they consumed selected beverages during their orthodontic therapy. They marked which of the listed foodstuffs created problems with oral hygiene during the treatment with a fixed orthodontic appliance, and which caused discomfort during eating. In addition, on a scale of 0 to 10 (0 – no change, 10 – maximum change of habits), respondents assessed the need to change hygienic and eating habits after installing a fixed appliance. For the purposes of the study, changes were grouped by intensity: minor change (1-2), medium-intensity change (3-5), major change (6-10).

The distribution of answers to particular questions was analysed. The percentage of patients eating 1-2 meals a day, 3 meals a day, 4-5 meals a day and >6 meals a day was assessed in the following independent groups: before the treatment, during the treatment and in the group of patients suffering pain. A similar assessment was conducted as regards the frequency of

consumption of selected foodstuffs, snacks, beverages and products causing discomfort and problems with oral hygiene.

Discrepancies in the answers concerning problems before and during the orthodontic treatment were verified by means of the difference test between two structure ratios based on the chi-square distribution.

The statistical analysis was performed by means of Statistica PL v. 10.0. The differences were regarded statistically significant with the significance level $p < 0.05$

RESULTS

72 patients (57.6%) responded that they had not changed their eating patterns during the orthodontic treatment with a fixed appliance, whereas medium-intensity changes took place in the case of 31 patients (24%). As regards hygienic habits, 54 respondents (43.5%) declared medium-intensity changes and 53 (42.7%) declared major changes (fig. 1). The number of meals during the orthodontic treatment did not change in relation to the period before the therapy. A considerable decline in the percentage of patients having 4-5 meals a day was observed during the period when patients suffered pain after the orthodontic adjustment (down by 32%) ($p < 0.002$) (fig. 2).

The question about changes in the frequency of eating selected foodstuffs during the orthodontic treatment vs. the period before the therapy, were answered in the following way: fruit and vegetables were eaten over 5 times a week by 53.3% of the patients before

the treatment and by 45.0% during the treatment (ns). Milk and dairy products were consumed more than once a day by ca. 28.0% of patients before the treatment and by 30.9% during the treatment (ns). Wholemeal bread was eaten once a week or more rarely by 54.5% of patients both before and during the treatment, whereas white bread was consumed more than once a day by 42.9% of the patients before and 41.2% during the treatment (ns). Fish was eaten twice a week or more often by 43.6% of the patients before and 46.6% during the treatment (ns) (fig. 3). 27.2% of the patients before the treatment and 32.3% during the treatment did not eat sweet snacks, or ate them rarely (ns). Savory snacks were not eaten or eaten rarely by 49.6% of the patients before and 58.5% during the treatment (ns). Raw vegetables were not eaten by 44.6% of the patients before and 52.1% during the treatment (ns), whereas fresh and dried fruit were avoided by 35.8% and 32.0% of the patients respectively (ns). Fewer than 25% of the respondents ate fresh and dried fruit twice a day or more often (tab. I). During the orthodontic treatment, the analysed cleft patients drank the following beverages at least once a day: coke and sweet fizzy drinks (24.8%), fruit juices (29.0%), still mineral water (55.2%), sparkling mineral water (18.7%) (tab. II).

Over 50% of the respondents claimed that their problems with oral hygiene were caused by: green vegetables, spinach (59.8%), tomato, cucumber (57.6%), bread (57.4%), seeds (pumpkin, sunflower, poppy) (59.8%), berries (54.1%). Hygienic problems were also created by: meat (58.2%), rice and groats, apples,

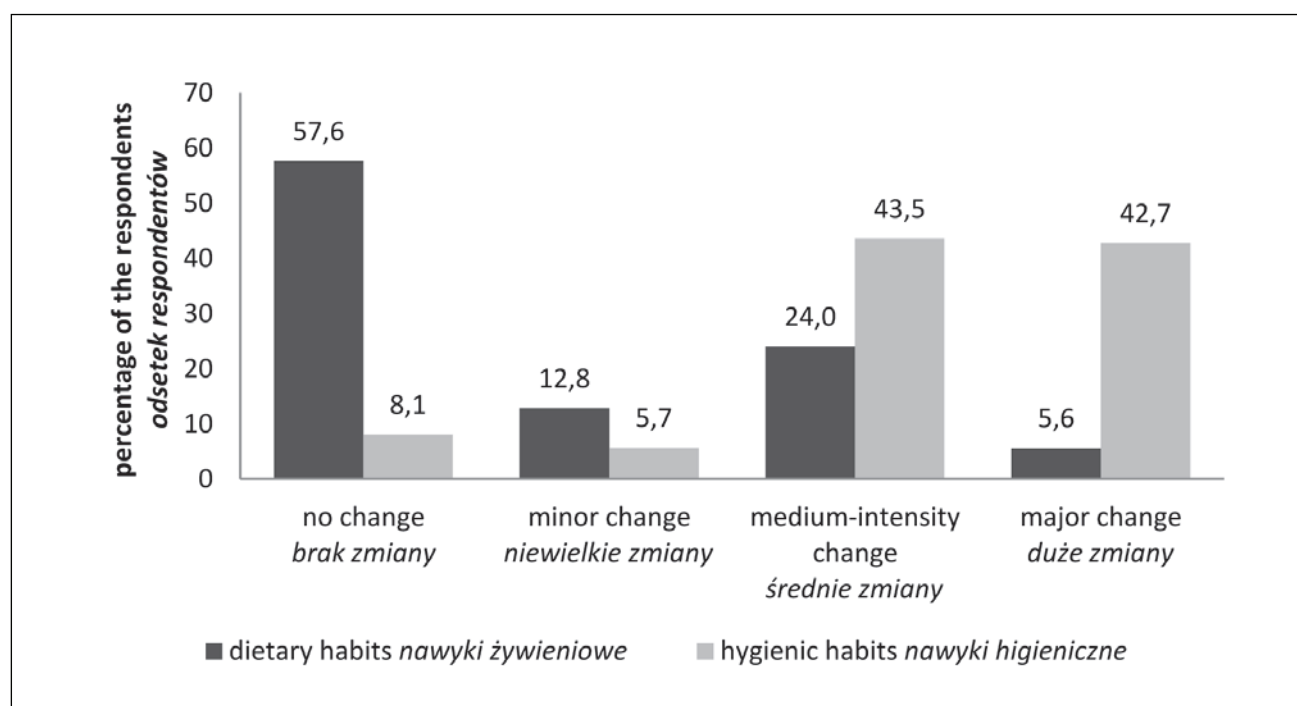


Fig. 1. Intensity of changes in dietary and hygienic habits during orthodontic treatment.

Ryc. 1. Nasilenie zmian nawyków żywieniowych i higienicznych w czasie leczenia ortodontycznego.

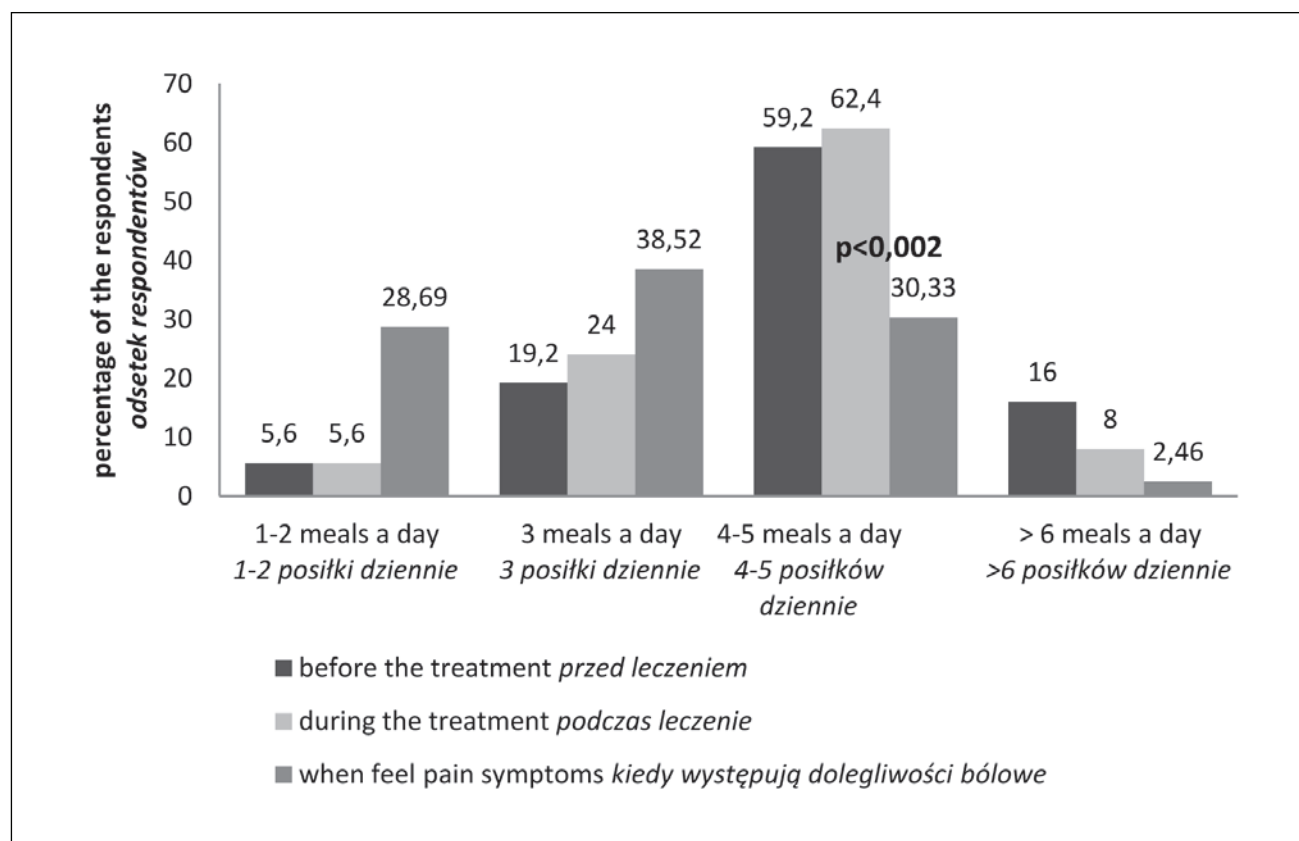


Fig. 2. Frequency of meals per day before and in the course of the treatment, as well as during the incidence of pain symptoms.

Ryc. 2. Częstość spożywania posiłków w ciągu dnia przed leczeniem, w trakcie leczenia, i w czasie występowania dolegliwości bólowych.

Table I. Consumption of selected snacks before and after installation of a fixed appliance (% of respondents).

Tabela I. Częstość spożywania wybranych przekąsek przed założeniem aparatu stałego i podczas leczenia ortodontycznego aparatem stałym (% badanych).

Frequency of consumption Częstość spożycia	Sweet snacks Słodkie przekąski		Savoury snacks Słone przekąski		Dry and fresh fruit Świeże i suszone owoce		Raw vegetables Świeże warzywa	
	before przed	after podczas	before przed	after podczas	before przed	after podczas	before przed	after podczas
no/rarely eaten nigdy/rzadko	27.2	32.3	49.6	58.5	35.8	32.0	44.6	52.1
once a day 1 x dziennie	39.2	48.4	33.6	30.1	36.6	45.1	37.2	37.2
2-3 a day 2-3 x dziennie	28.0	16.9	13.6	8.9	24.4	20.5	14.9	9.1
>4 a day >4 dziennie	5.6	2.4	3.2	2.4	3.3	2.5	3.3	1.7

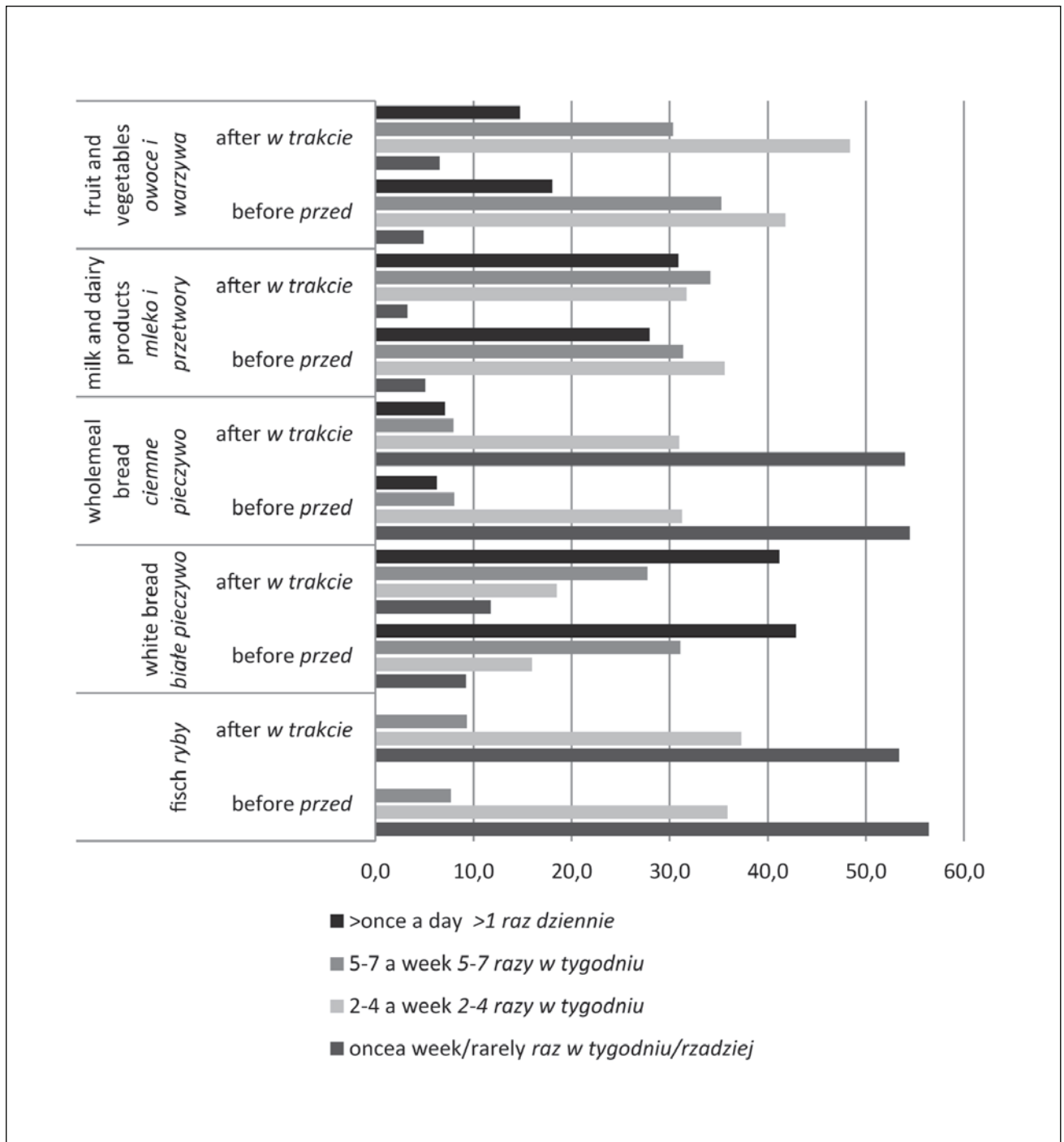


Fig. 3. Consumption of selected foodstuffs before and after the installation of a fixed appliance (% of respondents).

Ryc. 3. Częstotliwość spożywania wybranych produktów przed założeniem aparatu stałego i w trakcie leczenia ortodontycznego aparatem stałym (% badanych).

pears, peaches, cooked vegetables and cookies (almost 50% of cleft patients). 66.4% of patients stated that apples, pears and peaches cause discomfort during eating and 54.1% claimed the same about vegetables which required crunching. Nuts, seeds (pumpkin, sunflower, poppy) and sweets also caused discomfort while eating in 40% of the patients (fig. 4).

DISCUSSION

Following healthy nutrition rules makes it possible to improve the human health potential and prevent many metabolic diseases, e.g. diabetes, hypertension, cardio-vascular diseases etc. (3). The team's own results have been compared with the literature concerning the dietary patterns of school children and students

Table II. Consumption of selected beverages during the treatment with a fixed appliance (% of the respondents).

Tabela II. Częstość spożywania wybranych napojów w trakcie leczenia ortodontycznego aparatem stałym (% badanych).

Frequency of consumption <i>Częstość spożycia</i>	Coke and sweet fizzy drinks <i>Cola słodkie napoje gazowane</i>	Fruit juices <i>Soki owocowe</i>	Still mineral water <i>Woda mineralna niegazowana</i>	Sparkling mineral water <i>Woda mineralna gazowana</i>
no/rarely eaten <i>nigdy/rzadko</i>	28.0	7.3	19.2	38.2
once a week <i>raz w tygodniu</i>	28.0	16.1	6.4	23.6
2-4 a week <i>2-4 x tygodniu</i>	16.0	36.3	8.8	14.6
5-6 a week <i>5-6 x tygodniu</i>	3.2	11.3	10.4	4.9
once a day <i>raz dziennie</i>	12.0	11.3	11.2	5.7
>2 a day <i>>2 x dziennie</i>	12.8	17.7	44.0	13.0

without congenital craniofacial defects, as there are no reports on the eating habits of patients with cleft lip and palate. The orthodontic treatment of patients with cleft lip and palate takes many years, i.e. from 3.3 to 8.5 years, and on average patients have 49-94 orthodontic appointments (4). The conducted own study did not indicate significant differences in the eating habits of patients before and during the orthodontic treatment with a fixed appliance. Most of the patients stated that they did not change their eating habits during the treatment with a fixed appliance, yet they modified their oral hygiene. The change in hygienic habits should be attributed to intensive education during orthodontic appointments, which has also been noted by other authors (5, 6, 7, 8). During the orthodontic treatment with a fixed appliance, the percentage of patients consuming 4-5 meals a day has not changed significantly when compared to the period before the treatment, and is similar to the results of the studies conducted among adolescents and young adults presented by other authors (9, 10). In the period of pain after orthodontic adjustment appointments, the number of meals eaten daily declines until pain symptoms subside. However, the above does not affect the general assessment of changes in eating habits due to the short duration of pain (usually 3 days) as compared to the duration of the orthodontic treatment. Similar behaviour has been recorded in adolescents without congenital cleft defects who were treated orthodontically (11).

The National Institute of Public Health – National Institute of Hygiene informs that Poland has the penultimate place among EU countries in terms of the consumption of fruit and vegetables per capita

(12). Research conducted in Poland indicates that fruit and vegetables, which should be eaten several times a day as part of the main meals and snacks, are consumed by adolescents and young adults below the recommended amounts (10, 13, 14, 15, 16, 17). It is alarming that during the orthodontic treatment with a fixed appliance, the consumption decreases even further. It is probably related to the fact that elements of the orthodontic appliance installed in the oral cavity cause discomfort during eating big and hard foodstuffs which need to be bitten off in chunks, and create problems with maintaining proper oral hygiene.

Milk and dairy products contain calcium and protein, which are important at every age, yet they are especially vital during orthodontic treatment, as correct bone mineralisation contributes to the effectiveness and stability of the treatment outcomes (3, 18). Many authors signal too low a consumption of dairy products by adolescents and young adults (10, 13, 14, 19, 20). The results of the team's own study show that the consumption of dairy products is still insufficient, despite an increase recorded during the treatment.

It is common knowledge that wholemeal products prevent numerous afflictions and diseases (heart diseases, diabetes, obesity) due to the fact that they provide the best source of complex sugars and dietary fibre, as well as contain phytoestrogens, sterols, vitamins and minerals. Additionally, they increase saliva production and do not provide nourishment for oral bacteria, therefore they protect the teeth. White bread should be replaced with wholemeal products (21), yet studies indicate that adolescents prefer white bread (13, 14, 19,

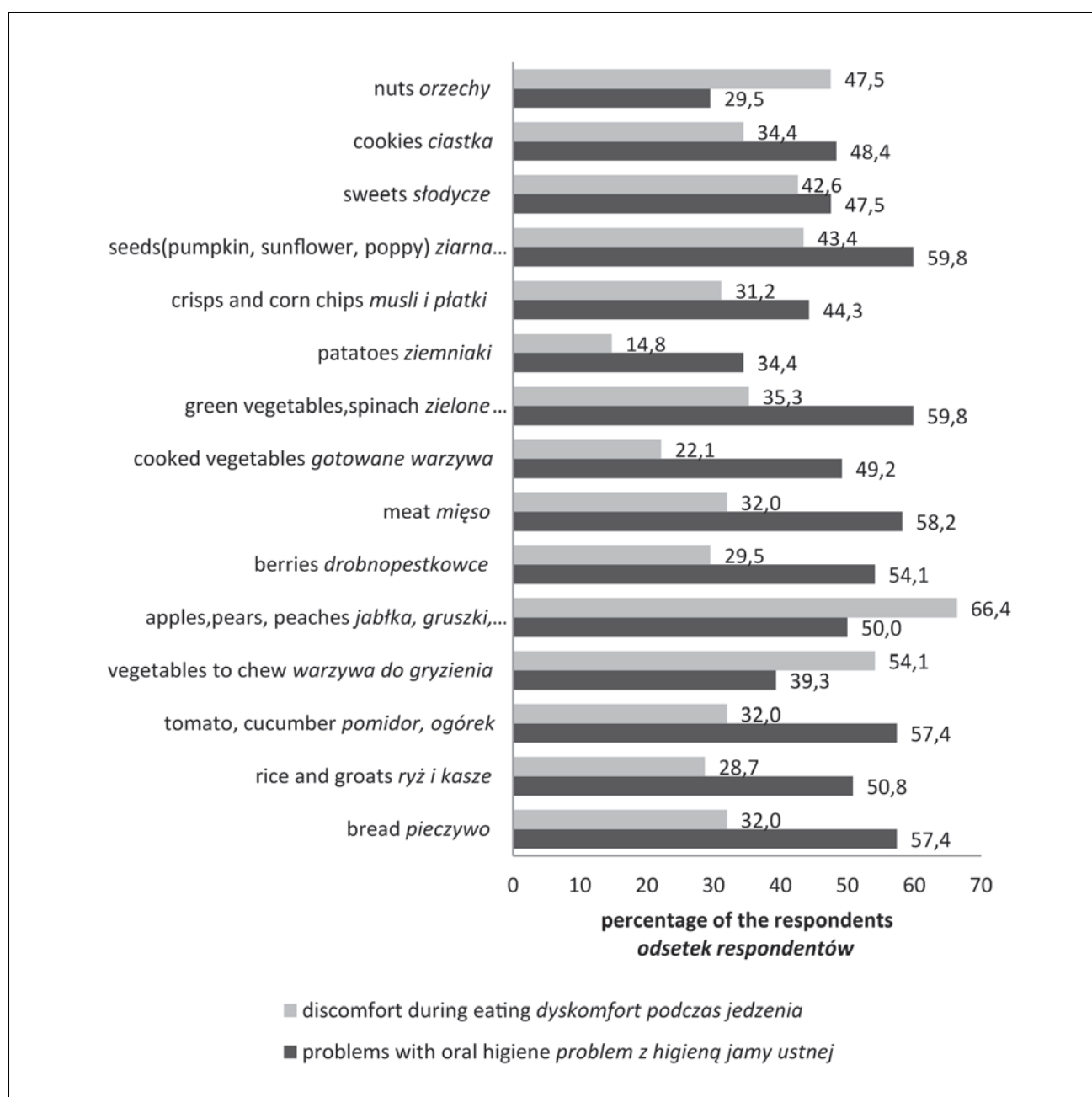


Fig. 4. Foodstuffs causing discomfort during eating and problems with oral hygiene (% of patients reporting that problem).

Ryc. 4. Produkty powodujące dyskomfort podczas jedzenia oraz kłopot z utrzymaniem higieny jamy ustnej (procent pacjentów zgłaszających problem).

20). The analysis of own studies showed that patients with a cleft of the primary and secondary palate also consumed white bread more often, both before and during orthodontic treatment.

Fish provides omega-3 fatty acids and is a good source of fluorine, iodine and animal protein. It is recommended to eat fish two or three times a week (3, 22). Many scientists point out the incorrect eating habits of adolescents as regards fish (13, 14, 23,24). It is disturbing that the consumption of fish by cleft patients does not meet the dietary recommendations either before or during orthodontic treatment.

Snacks eaten between meals may be assessed positively, provided that they comprise wholesome products (fruit, vegetables or low-fat dairy products), or negatively if they consist of monosaccharides and other easily assimilated carbohydrates, saturated fatty acids, trans fats or sodium chloride. Snacks are especially disadvantageous during orthodontic treatment, because food deposited on the elements of the fixed appliance activates the constant production of acids in the oral cavity, which leads to dental caries (25, 26). The team's own studies indicated that unfavourable eating habits, i.e. eating between meals, continue during orthodontic

treatment. Their frequency is similar as in the reports of numerous authors conducting research among adolescents (13, 14, 15, 17, 24).

In line with the recommendations of experts, water should be drunk every day instead of sweet drinks (18, 27). Our research showed that orthodontically treated patients consume too many sweet, fizzy drinks and juices (although more rarely than in the other reports) (13, 16, 17, 19) and drink too little water (similar to other reports) (13).

During the orthodontic treatment of patients with craniofacial cleft defects, which takes many years, patients should be constantly educated not only in the matters of oral hygiene but also as regards correct dietary habits. It is likely that such campaigns will bring good effects, as in the case of oral hygiene. Prevention of chronic non-contagious illnesses (referred to as civilisation diseases) reduces the risk of teeth and periodontium diseases, which contributes to obtaining good and stable effects of the orthodontic therapy.

CONCLUSIONS

1. The eating habits of a considerable percentage of patients with a cleft defect, before or during the treatment with a fixed appliance, do not comply with the rules of healthy nutrition.
2. The dietary education of patients undergoing orthodontic treatment is necessary to ensure proper oral health and prevent diet-related illnesses.

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