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OFICJALNE PISMO POLSKIEGO TOWARZYSTWA FIZJOTERAPII

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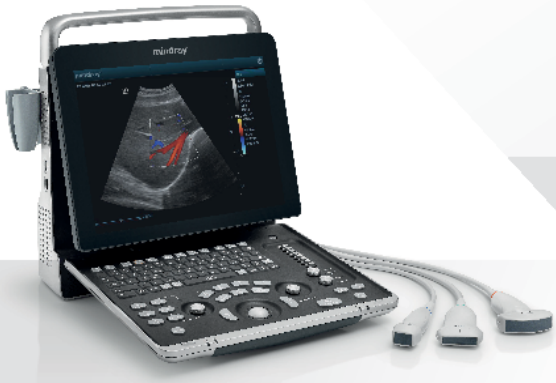

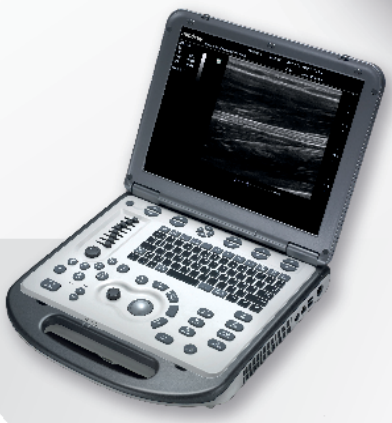

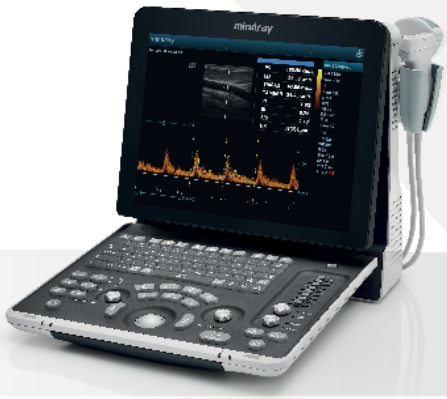

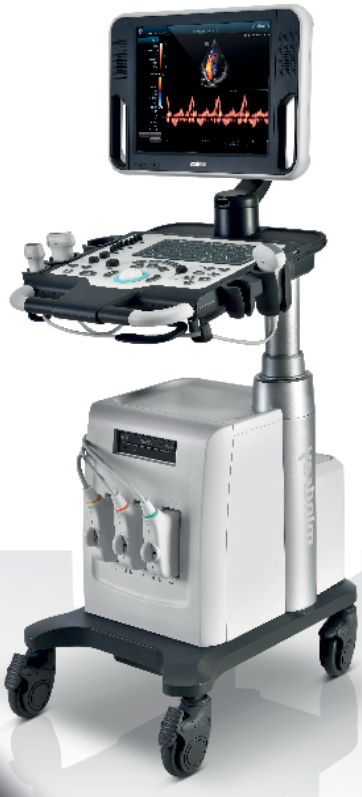

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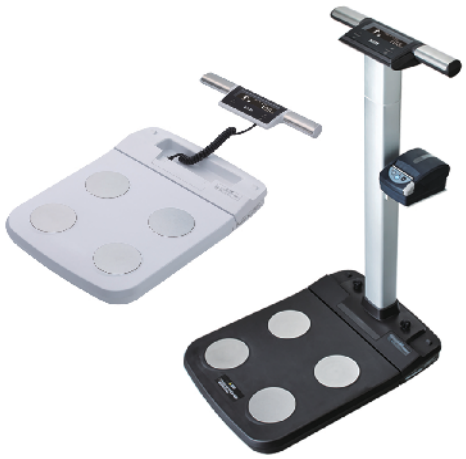

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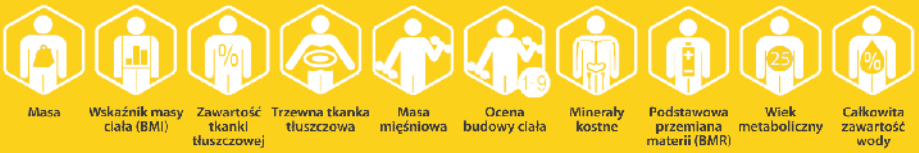

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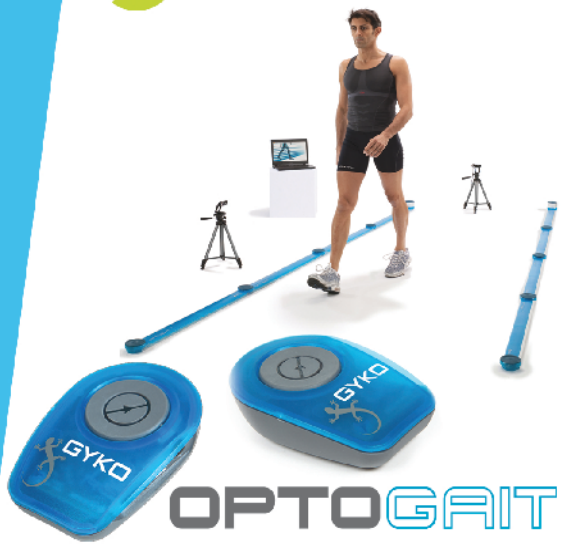

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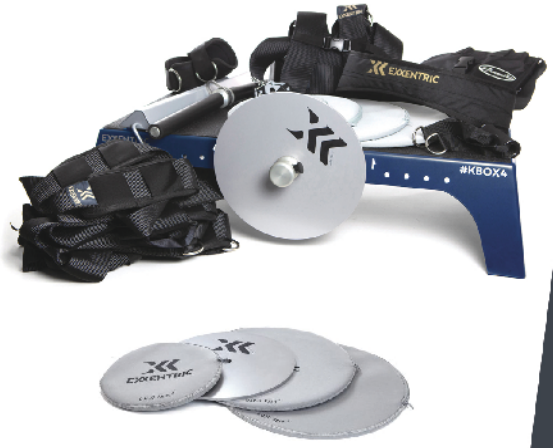

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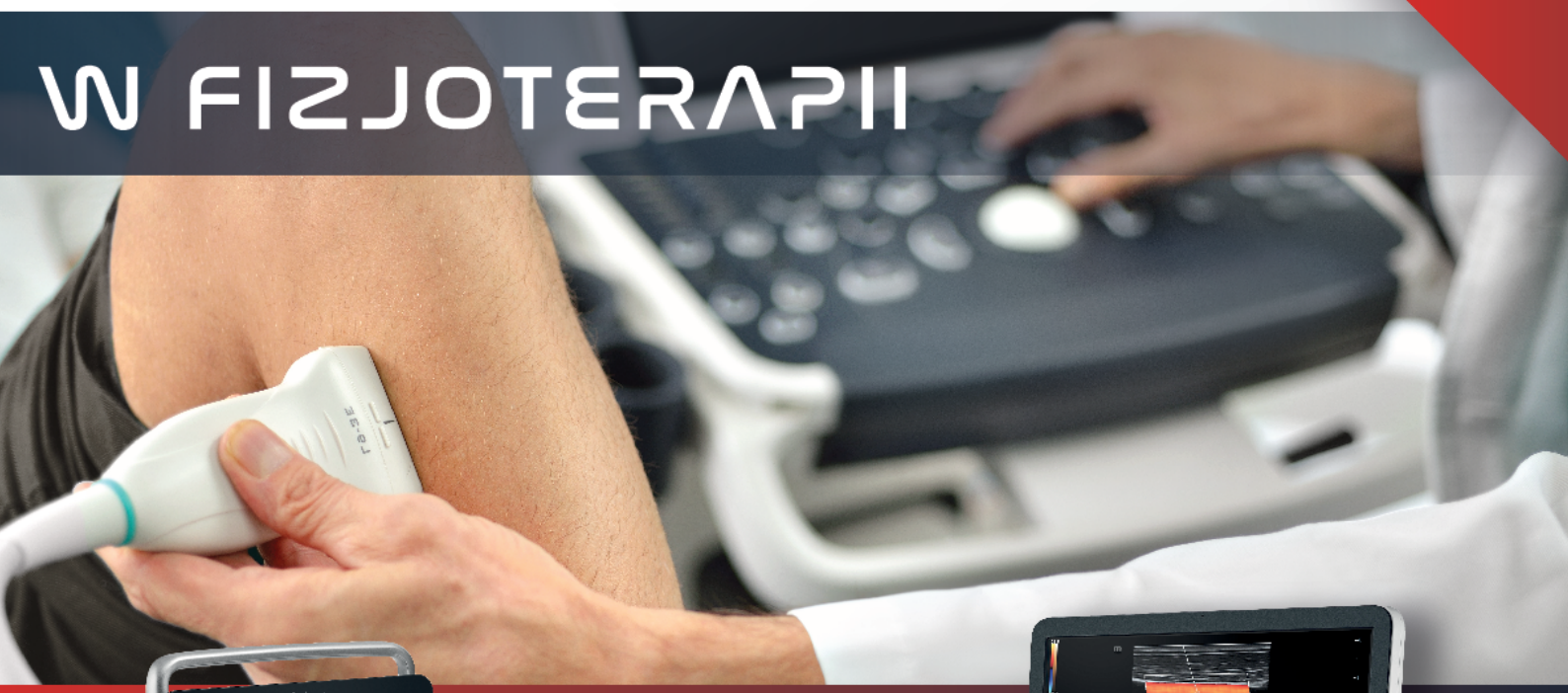

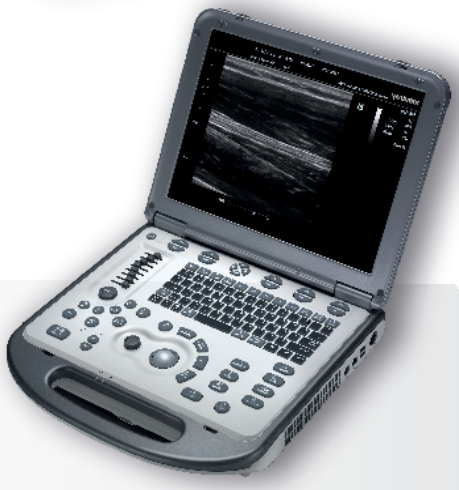

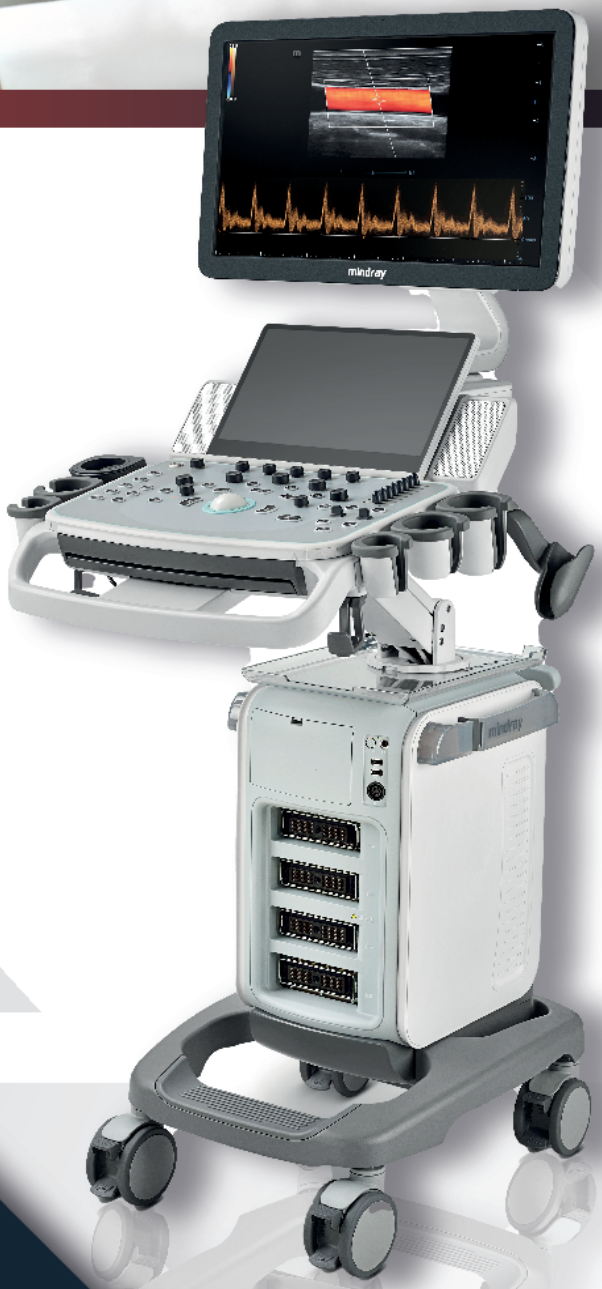

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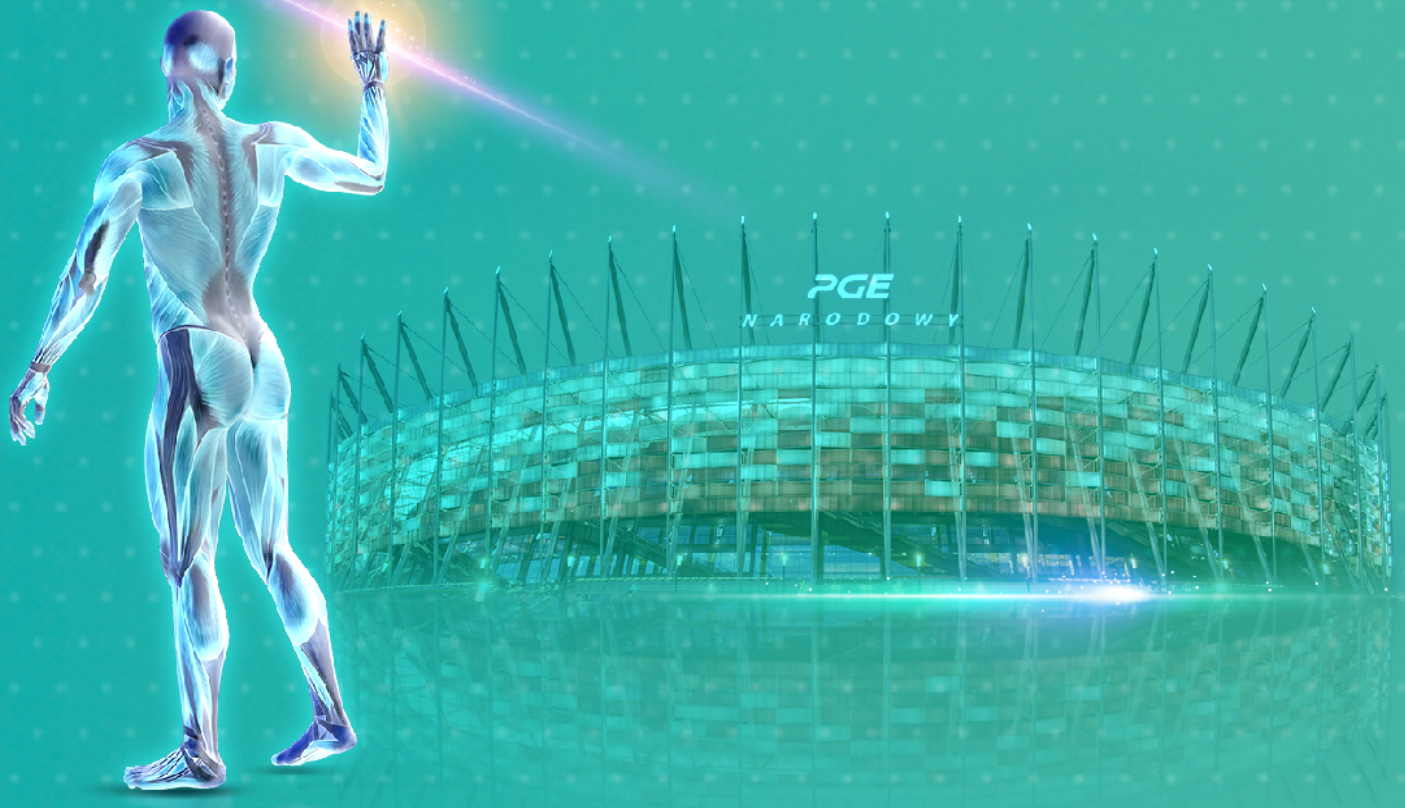

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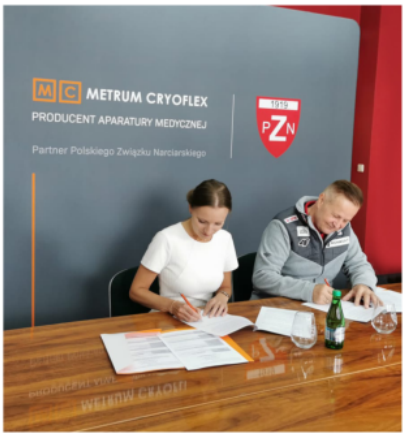

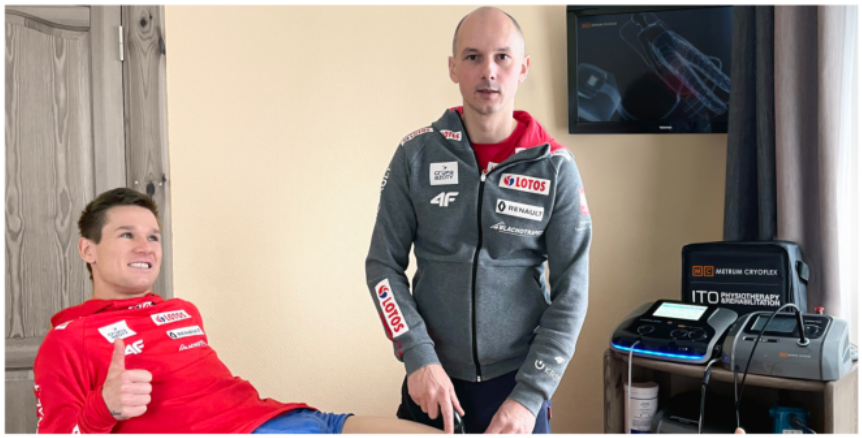

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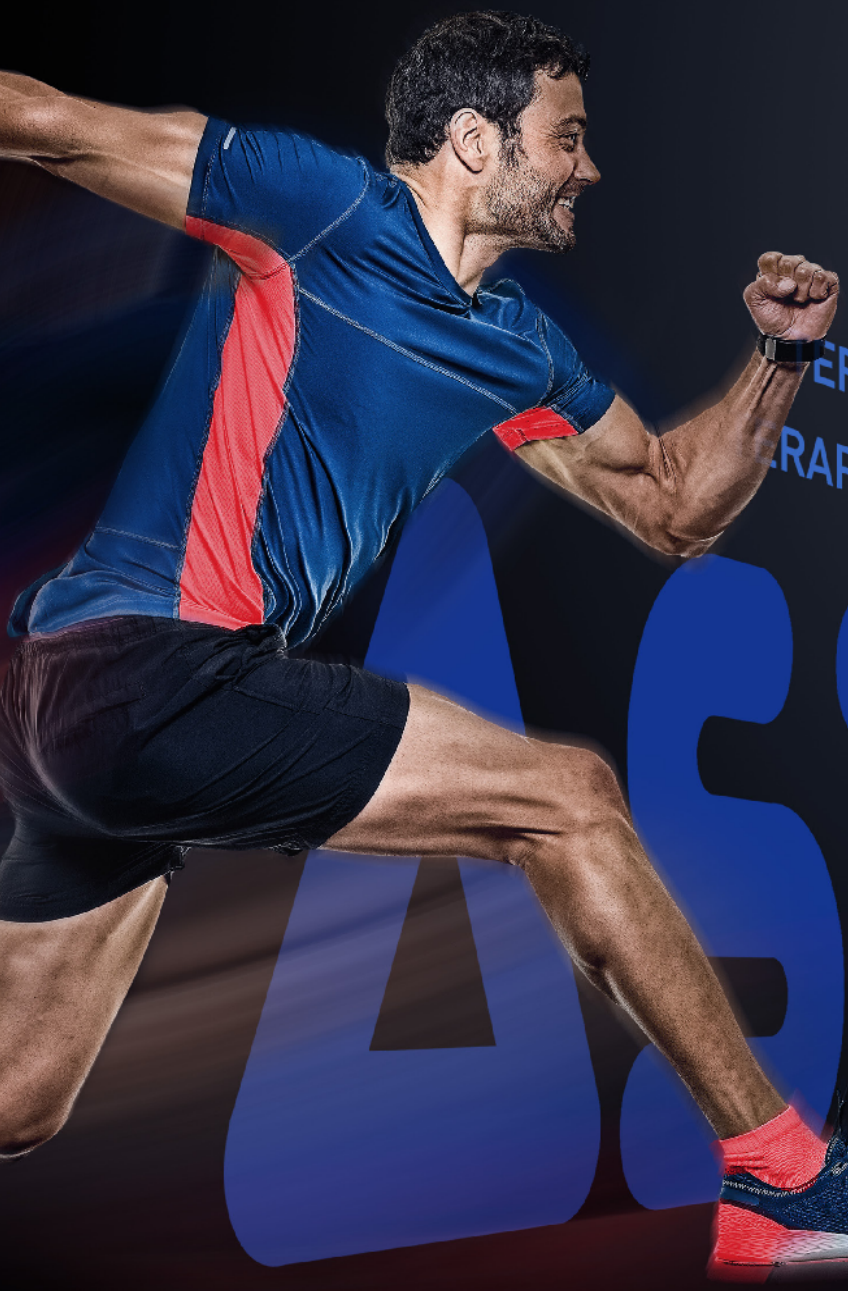

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Influence of chosen factors on the degree of disability resulting from pain in the cervical and lumbar spine among dentists

Wpływ wybranych czynników na stopień niesprawności wynikającej z dolegliwości bólowych szyjnej i lędźwiowej części kręgosłupa u lekarzy dentystów

Ewa Puszczałowska-Lizis[1(A,B,C,D,E,F)], Izabela Zbrońska[2,3,4(C,D,F)], Wioletta Mazur[5(A,B,D)], Sabina Lizis[1(C,D,F)]

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Abstract

Introduction. Dentists, due to the specificity of their professional work, consisting in prolonged stay in a static sitting position, frequent tilting and rotation of the torso, repeated sequences of movements, are at risk of diseases of the musculoskeletal system, which can lead to disability. The aim of this study was to evaluate an impact of chosen factors on the degree of disability resulting from pain in the cervical and lumbar spine among dentists.

Material and methods. The results of a diagnostic survey performed among 97 professional active dentists aged 30-40 years, who during 2 years preceding the study experienced back pain, were analysed. The research tool was the author's questionnaire, Neck Disability Index (NDI) and Oswestry Distability Index (ODI). The collected research results were analysed with the use of Mann-Whitney U test and Spearman rank correlation.

Results. Only 4% of dentists declared reliable compliance with the principles of ergonomics at work, and 72% of respondents undertook physical activity in their free time. No statistically significant relationships were found between age, body composition, seniority in the profession of a dentist, the number of working hours per day, and the level of disability determined on the basis of the NDI and ODI. Working from lateral or posterior access, taking up physical activity, and using physiotherapeutic procedures were not factors differentiating the level of disability of the respondents.

Conclusions. There is a need to create programs popularizing the need for reliable compliance with the principles of ergonomics in the profession of a dentist, and the implementation of new concepts of work organisation with reference to researched professional group.

Key words:
health policy, medicine of work, work ergonomics

Streszczenie

Wstęp. Lekarze dentyści z uwagi na specyfikę pracy zawodowej, polegającą między innymi na długotrwałym przebywaniu w statycznej pozycji siedzącej, częstym pochylaniu i rotacji tułowia, powtarzanych sekwencjach ruchów, zaliczają się do grupy ryzyka schorzeń układu mięśniowo-szkieletowego, które z czasem mogą prowadzić do niesprawności. Cel pracy stanowiła ocena wpływu wybranych czynników na stopień niesprawności wynikającej z dolegliwości bólowych szyjnej i lędźwiowej części kręgosłupa u osób wykonujących zawód dentysty.

Materiał i metody. Analizie poddano wyniki sondażu diagnostycznego 97 aktywnych zawodowo lekarzy dentystów w wieku 30-40 lat, którzy w ciągu 2 lat poprzedzających badania doznali dolegliwości bólowych kręgosłupa. Narzędzie badawcze stanowiła ankieta autorska oraz wskaźniki niesprawności w bólach szyjnej (NDI, ang. *Neck Disability Index*) i lędźwiowej (ODI, ang. *Oswestry Distability Index*) części kręgosłupa. Obliczenia wykonano przy użyciu testu U Manna-Whitney'a i korelacji rang Spearmana.

Wyniki. Zaledwie 4% dentystów deklarowało rzetelne przestrzeganie zasad ergonomii pracy, a 72% respondentów podejmowało aktywność fizyczną w czasie wolnym. Nie stwierdzono statystycznie istotnych związków między wiekiem, budową ciała, stażem pracy w zawodzie dentysty i dzienną liczbą godzin pracy a stopniem niesprawności określonym na podstawie kwestionariuszy ODI i NDI. Praca z dostępu bocznego lub tylnego, podejmowanie aktywności fizycznej, korzystanie z zabiegów fizjoterapeutycznych nie stanowiły czynników różnicujących poziom niesprawności badanych osób.

Wnioski. Istnieje potrzeba tworzenia programów upowszechniających potrzebę rzetelnego przestrzegania zasad ergonomii pracy w zawodzie dentysty, jak również wdrażania nowych koncepcji organizacji pracy w odniesieniu do badanej grupy zawodowej.

Słowa kluczowe:
polityka zdrowotna, medycyna pracy, ergonomia pracy

Introduction

Dentists, due to the specificity of their professional work, consisting in prolonged stay in a static sitting position, frequent tilting and rotation of the torso, repeated sequences of movements, are at risk of diseases of the musculoskeletal system, which can lead to disability. Hodacova et al. [1] pointed to the socio-economic losses resulting from the need for a sick leave, a decrease in productivity, and even giving up work due to disability. Revankar et al. [2] showed that disorders of the musculoskeletal system appear already in the early years of a dental career, as a result of non-compliance with the principles of work ergonomics, as well as work stress and fatigue. Rabei et al. [3] reported that muscle imbalances affect 63-93% of professionally active dentists. According to Vodanović et al. [4] every year 70% of dentists experience pain in the lower part of the spine, neck and shoulder area in response to overloading the locomotor system during professional activities. According to the authors, most of the ailments disappear after stopping these activities. On the other hand, excessive, long-term overload leads to the formation or intensification of degenerative-productive changes in the structures of the musculoskeletal system. The analysis of the literature allows to see a connection between the pathology of the spine and reduced strength and flexibility of postural muscles, as well as with the working conditions of dentists, especially non-ergonomic position during work, improper selection of the dental chair and magnifying tools, poor lighting, too few and/or short breaks at work or psychological stress [5–12]. Feng et al. [13] pointed that the most common deviations from the balanced position among dentists included rotation of the cervical and lumbar spine, excessive lateral head tilt, lifting the shoulders without support, increasing thoracic kyphosis and reducing lumbar lordosis, and setting the lower legs to the thighs at an angle below 90. According to the authors, maintaining this position for an extended period of time can cause chronic muscle fatigue, discomfort and even pain. Constant exposure of muscles and joints to static loads may lead to adaptive changes in soft tissues, cause their tension, shortening, or other adverse effects. Pîrvu et al. [14] noted that the correct position of the dentist during clinical activities gives him the most favourable working conditions, i.e. access, visibility and control of the patient's oral cavity, as well as physical and mental comfort. According to Hodacova et al. [1] the health and well-being of the dentist is critical to successful dental practice and the well-being of the patient. It enables concentration and precision, and therefore reduces the risk of therapeutic errors.

The aim of this study was to evaluate an impact of chosen factors on the degree of disability resulting from pain in the cervical and lumbar spine among dentists.

Material and methods

The results of a diagnostic survey performed among 97 professional active dentists aged 30-40 years, who during 2 years preceding the study experienced back pain, were analysed.

Tab. 1. Sociodemographic and clinical characteristics of the respondents

Age [years], mean± SD	33.42 ± 3.33
Length of service [years], mean ± SD	9.01 ± 3.29
Daily working time [hours], mean ± SD	7.48 ± 1.67
Body weight [kg], mean ± SD	66.47 ± 11.31
Body height [cm], mean ± SD	170.64 ± 9.05
BMI index, mean ± SD	19.43 ± 2.84
Body build, n (%)	
Underweight	3 (3.0)
Correct	51 (53.0)
Overweight	43 (44.0)

Research tools:
• a questionnaire to collect sociodemographic and clinical data, containing questions about professional issues, health behavior, pain characteristics, and treatment and therapeutic procedures;
• disability index in cervical spine pain NDI, Neck Disability Index [15];
• disability index in lumbar spine pain ODI, Oswestry Distability Index [16].
In the case of the NDI and ODI indices, the responses were included on a 6-point scale (from 0 to 5 points for every answer). The scores for each of the functional fitness categories were scaled negative (i.e., lower values indicated better functional performance). The aggregate score describing the degree of disability was estimated on a percentage scale from 0 to 100%. In order to classify the degree of disability of the respondents, the following criteria were adopted: 0-20% minimal disability; 21-40% moderate disability; 41-60% severe disability; 61-80% crippled, 81-100% bed bound [15, 16].
Consistency of pertinent variables with reference values in normal distribution was verified by means of the Shapiro-Wilk test. The collected research results were analysed with the use of Mann-Whitney U test and Spearman rank correlation in Statistica 13.1 by StatSoft. The results were considered statistically significant on the predetermined significance level $\alpha = 0.05$.

Results

Data in tab. 2 show that the surveyed dentists performed a similar percentage of occupational activities in a sitting position with lateral (56% of the group) and rear access (44% of the group). The vast majority (91% of the group) used assistance of a dentist's assistant. Reliable compliance with the principles of work ergonomics was declared by 4% of the group, 82% of the group stated that they complied to some extent, and 14% did not follow the principles of work ergonomics. Taking up physical activity in

their free time was declared by 78% of the surveyed dentists, and the most frequently chosen form of activity was walking (63% of the group) or other, such as: dancing, yoga, tennis, skiing (43% of the group). The highest percentage of the respondents (38% of the group) undertook physical activity every two weeks, 26% of the respondents once a month or other frequency (once a year).

Tab. 2. Occupational details and health behaviour

Position during professional activities, n (%)	
Sitting with lateral access	54 (56.0)
Sitting with rear access	43 (44.0)
Standing	0 (0.0)
Using assistance of a dentist's assistant, n (%)	
Yes	88 (91.0)
No	9 (9.0)
Reliable compliance with the principles of work ergonomics, n (%)	
Diligently adheres to the principles of work ergonomics	4 (4.0)
To a certain extent, he adheres to the principles of work ergonomics	80 (82.0)
Does not follow the rules of work ergonomics	13 (14.0)
Taking up physical activity in free time, n (%)	
Yes	76 (78.0)
No	21 (22.0)
Preferred forms of physical activity, n (%)*	
Fitness	29 (38.0)
Walks	48 (63.0)
Swimming	18 (24.0)
Cycling	31 (40.0)
Runs	17 (22.0)
Horse riding	2 (3.0)
Team sports games	2 (3.0)
Another	33 (43.0)
The frequency of using the indicated forms of physical activity, n (%)	
3 times per week	2 (3.0)
2 times per week	2 (3.0)
1 time per week	2 (3.0)
Every two weeks	30 (38.0)
Once a month	20 (26.0)
Another	20 (26.0)

**possibility to indicate several answers*

Most of the surveyed dentists experienced back pain every day (33% of the group), in the case of 27% of the group, these ailments occurred once a week or once a month. In most cases (46% of the group), the pain was localized in the lumbar spine. Only 25% of the respondents used medical care due to the occurrence of back pain, while 70% of the respondents came to a physiotherapist, of which the vast majority (76% of the group) attended a massage. Improvement in functional fitness after physiotherapy was reported by 79% of dentists (tab. 3).

Tab. 3. Characteristics of pain and management

The incidence of pain ailments, n (%)	
Every day	32 (33.0)
Once a week	26 (27.0)
Once a month	26 (27.0)
Once a year	13 (13.0)
Place of pain symptoms, n (%)	
The cervical part of the spine	26 (27.0)
Thoracic part of the spine	15 (16.0)
/Lumbar spine	45 (46.0)
The whole spine	11 (11.0)
Using medical care in connection with the occurrence of back pain, n (%)	
Yes	24 (25.0)
No	73 (75.0)
Using the services of a physiotherapist, n (%)	
Yes	68 (70.0)
No	29 (30.0)
Type of physiotherapy treatments, n (%) *	
Physical therapy	34 (50.0)
Gymnastics	24 (35.0)
Massage	52 (76.0)
Combination therapy	9 (13.0)
Other (osteopathy)	3 (4.0)
Other (manual therapy)	3 (4.0)
Other (regenerative treatments)	1 (1.0)
Improvement of functional efficiency after physiotherapy, n (%)	
Yes	54 (79.0)
No	1 (1.0)
Hard to say	13 (20.0)

**possibility to indicate several answers*

Data in tab. 4 indicate that in the case of the NDI index, the highest scores were noted in case of the variable: "headache", and the mean of the NDI [%] scores was 12.58 ± 8.67%. The cumulative results ranged from 0–38% of points. In the case of the ODI index, the highest values were recorded for "pain intensity" and "pain intensity change". The aggregate results were in the range of 0–40% of points, and their average was 13.75 ± 9.98%.

Tab. 4. Descriptive statistics of variables relating to individual categories of functional fitness on the basis of NDI and ODI indices

NDI	Mean ± SD	Max–min	Q25	Me	Q75
Pain intensity	0.69 ± 0.86	3.00–0.00	0.00	0.00	1.00
Personal care	0.10 ± 0.34	2.00–0.00	0.00	0.00	0.00
Lifting	0.32 ± 0.64	4.00–0.00	0.00	0.00	1.00
Reading	0.78 ± 0.75	2.00–0.00	0.00	1.00	1.00
Headaches	1.64 ± 1.06	5.00–0.00	1.00	2.00	2.00
Concentration	0.58 ± 0.73	4.00–0.00	0.00	0.00	1.00
Work	0.85 ± 0.62	2.00–0.00	0.00	1.00	1.00
Driving	0.53 ± 0.71	2.00–0.00	0.00	0.00	1.00
Sleeping	0.46 ± 0.71	3.00–0.00	0.00	0.00	1.00
Recreation	0.34 ± 0.58	2.00–0.00	0.00	0.00	1.00
NDI %	12.58 ± 8.67	38.00–0.00	6.00	10.00	18.00
ODI	**Mean ± SD**	**Max–min**	**Q25**	**Me**	**Q75**
Pain intensity	1.92 ± 1.37	5.00–0.00	1.00	2.00	2.00
Personal care	0.19 ± 0.51	2.00–0.00	0.00	0.00	0.00
Lifting	0.42 ± 0.90	5.00–0.00	0.00	0.00	1.00
Walking	0.08 ± 0.37	3.00–0.00	0.00	0.00	0.00
Sitting	0.74 ± 0.88	3.00–0.00	0.00	0.00	1.00
Standing	0.96 ± 0.90	4.00–0.00	0.00	1.00	1.00
Sleeping	0.57 ± 0.73	3.00–0.00	0.00	0.00	1.00
Sex life	1.07 ± 1.05	4.00–0.00	0.00	1.00	1.00
Social life	0.08 ± 0.31	2.00–0.00	0.00	0.00	0.00
Traveling	0.85 ± 0.85	3.00–0.00	0.00	1.00	1.00
ODI %	13.75 ± 9.98	40.00–0.00	6.00	12.00	18.00

The vast majority of the dentists surveyed had minimal disability (NDI: 83% of the group; ODI: 80% of the group), while the remaining respondents had moderate disability (tab. 5).

Tab. 5. Categories of disability caused by back pain according to NDI and ODI

Level of disability, n (%)	
NDI	
Minimal disability	81 (83.0)
Moderate disability	16 (17.0)
Severe disability	0 (0.0)
Crippled	0 (0.0)
Complete disability	0 (0.0)
ODI	
Minimal disability	78 (80.0)
Moderate disability	19 (20.0)
Severe disability.	0 (0.0)
Crippled	0 (0.0)
Complete disability	0 (0.0)

There were no statistically significant relationships between age, BMI, length of service in the profession of a dentist, daily number of working hours with the NDI and ODI results (tab. 6).

Tab. 6. Relationships of selected variables with the results of NDI and ODI indices

Variable	NDI		ODI	
	R	p	R	p
Age	0.02	0.816	0.11	0.279
BMI index	0.14	0.166	0.10	0.311
Length of service in the profession of a dentist	−0.02	0.838	0.08	0.426
Daily number of working hours	0.02	0.880	−0.03	0.784

There were statistically significant differences in the results of NDI ($p = 0.013$) and ODI ($p = 0.026$) indices in the subjects using and not using medical care due to the occurrence of back pain. The cumulative percentages of these indices were higher in people who used medical care (tab. 7).

Tab. 7. Comparison of the results with regard to work-related issues and health behavior

	Working in a sitting position with side access			Working in a sitting position with rear access			Z	p
	Mean ± SD	Me	Max–min	Mean ± SD	Me	Max–min		
NDI	11.81 ± 8.79	10.00	36.00–0.00	13.53 ± 8.52	10.00	38.00–0.00	−1.15	0.248
ODI	12.85 ± 9.97	10.00	40.00–0.00	14.88 ± 9.98	12.00	40.00–2.00	−1.15	0.246
	Physically active			Physically inactive				
NDI	12.97 ± 8.83	10.00	36.00–0.00	11,14 ± 8.11	10.00	38.00–0.00	0.87	0.385
ODI	13.79 ± 10.00	12.00	40.00–0.00	13,62 ± 10.13	12.00	40.00–2.00	0.14	0.888
	Benefiting from medical care			Not using from medical care				
NDI	16.42 ± 9.96	16.00	36.00–0.00	11.32–7.88	10.00	38.00–0.00	2.49	0.013*
ODI	18.75 ± 12.45	16.00	40.00–2.00	12.11–8.49	12.00	40.00–0.00	2.22	0.026*
	Benefiting from a physiotherapist's services			Not using from a physiotherapist's services				
NDI	13.09 ± 8.83	10.00	36.00–0.00	11.38 ± 8.32	10.00	38.00–0.00	0.84	0.401
ODI	14.18 ± 9.88	12.00	40.00–0.00	12.76 ± 10.30	10.00	40.00–2.00	0.91	0.363

*$\alpha = 0.05$

Discussion

The authors' own research shows that only 4% of the surveyed dentists accurately followed the rules of work ergonomics, and 82% believed that they followed these rules to some extent. According to Mohseni-Bandpei et al. [17] the lack of preventive treatment in the form of relaxation and stretching exercises, adopting ergonomic positions, the use of auxiliary devices and the help of a dentist's assistant increases the risk of musculoskeletal disorders. In consonance with Gosavi et al. [18] improper positioning of dental tools, equipment and materials results in frequent one-sided rotation and tilting of the torso. The assistance of a dentist's assistant relieves the dentist from having to reach for tools, and thus reduces the deviations of the dentist's torso. Most of the dentists studied by Vodanović et al. [4] emphasized the importance of regular physical activity in the prevention of occupational diseases, while a small part paid attention to a balanced diet, the need to change positions during work, as well as ergonomic arrangement of dental equipment. The results of the studies by Meisha et al. [10] demonstrated a relatively high level of knowledge of the principles of ergonomics in the professional practice of dentists, however, this knowledge was not applied in practice. Alyahaya et al. [12] collected data among 561 dentists which allowed to

state that women practicing this profession show a higher awareness of the principles of work ergonomics. The results of Batham and Yasobant [19] in Bhopal, India showed that a small percentage of 93 dentists were knowledgeable about ergonomics. Dentists with low awareness in this regard were more likely to develop disorders of the musculoskeletal system. Prudhvi et al. [20] emphasized that due to the significant impact of discomfort from the musculoskeletal system as a result of work on the well-being of dentists, it is necessary to take preventive measures at the beginning of their professional career. Also, Jaoude et al. [21] are of the opinion that education in the context of work ergonomics should be started as early as possible and work-related health problems should be addressed at clinical symposia and research in order to raise awareness in this regard.

Sharma and Golchha [22] emphasized that the incidence and intensity of disorders of the musculoskeletal system may decrease as a result of systematic exercise aimed at improving central stabilization and relaxing and strengthening specific groups of muscles. In the author's own material, physical activity in free time was undertaken by 78% of the respondents, most of them once every two weeks. Walks were the preferred form of activity. In turn, the data obtained by Jaoude et al. [21] indicate that only half of the 314 dentists in Lebanon undertook sporadic physical activity. Similar results were obtained by Iwuala et al. [23] based on research by healthcare professionals in southwestern Nigeria. The authors noted a relationship between the incidence of non-communicable diseases and a high index of physical inactivity and BMI. Alyahaya et al. [12] showed that despite the high awareness of the positive impact of physical activity on the human body, only half of the surveyed dentists from Saudi Arabia declared physical activity, including stretching exercises during and after work. The frequency of taking up physical activity decreased in proportion to the increase in the workload. A large percentage of respondents reported feeling exhausted due to work overload. Koneru et al. [24] found that yoga was more effective in the prevention and treatment of musculoskeletal disorders in Mumbai dentists compared to aerobics or brisk walking.

In the authors' own research, pain in the spine was reported daily by most dentists and concerned the lumbar part of the spine. Also, Gaowgzeh et al. [25] found a high percentage of disorders of the musculoskeletal system in the surveyed Saudi Arabian dentists. Similar results were obtained by Al-Rawi et al. [26] in the group of dentists from the United Arab Emirates. Most reported back pain, and tests results using Posture Screen Mobile device showed deviations from the correct positioning of the cervical spine. According to the authors, these data are the result of inappropriate habits and lack of awareness of work ergonomics. Sharma [22] in dentists from India most often noted pain in the lower back, neck and shoulders. Vodanović et al. [4] researching dentists from Croatia, Hodacova et al. [1] as a result of research on the dentists from the city of Hradec Králové in the northern part of the Czech Republic, Phedy et al. [27] in Indonesian dentists, Rafeemanesh et al. [28] among dentists from the city of Mashhad in Northeast Iran, Mohseni-Bandpei et al. [17] studying dentists from Tehran in Iran, Jaoude et al. [21] in studies of dentists from Leba-

non reported a higher incidence of pain in the cervical spine. In turn, Revankar et al. [2] based on studies by dentists from the city of Salem, Meisha et al. [10] studying dentists from the Mecca Province in Western Saudi Arabia, Bozkurt et al. [29] in dentists in Ankara, Prudhvi et al. [20] in professionally active dentists from the coastal town of Visakhapatnam, Andhra Pradesh state in eastern India – found a similar incidence of pain in the cervical and lumbar spine.

Our research shows that the services of a physiotherapist were used much more often than medical care. Massage was the most popular form of therapy. Most of the dentists surveyed reported improved functional performance as a result of physiotherapy. Vodanović et al. [4] showed that women more often than men reported to a doctor in case of back pain. Moreover, the frequency of seeking medical advice increased with age. In turn, the majority of dentists studied by Jaoude et al. [21] in case of pain, she used spa treatment or physiotherapy, and the results of Meisha et al. [10] indicated pharmacotherapy, kinesiotherapy and massage.

The vast majority of the dentists we surveyed had minimal disability. Prudhvi et al. [20] showed that discomfort due to musculoskeletal disorders has a mild to moderate effect on the ability of dentists to work. Gaowgzeh et al. [25] reported mild and moderate severity of symptoms in most of the dentists surveyed. According to the authors, the cause of back pain in dentists is a muscular imbalance between the lower back and the abdominal muscles in a sitting position. Prolonged, repeated tilting of the torso towards the patient may overload the extensor muscles of the lower back and weaken the abdominal muscles. Mohseni-Bandpei et al. [17] based on the ODI results found moderate disability in most of the dentists surveyed. Also Ísper Garbin et al. [30] as a result of studies with the Nordic questionnaire, the Pain and Disability Questionnaire (PDQ) and the numerical pain scale found moderate disability in dental surgeons employed in public clinics in the northwest of São Paulo, Brazil. Hodacowa et al. [1] observed moderate or severe disability in more than half of dentists.

The results of our research allowed to conclude that age, body composition, length of service in the dentist profession, number of working hours per day showed no correlation with the results of NDI and ODI. Also Mohseni-Bandpei et al. [17] found no relationship between the frequency of back pain and the length of service in the dentist profession. Gaowgzeh et al. [25] concluded that the occurrence of back pain does not correlate with the length of service, as well as the number of working hours during the day and the number of patients treated daily. Jaoude et al. [21] found no correlation between the number of working days per week and the frequency of back pain. Different conclusions were reached by Alyahaya et al. [12], Vodanović et al. [4], and Mohseni-Bandpei et al. [17], because the frequency of musculoskeletal disorders increased with increasing length of service in the dentist profession. In turn, Phedy et al. [27] showed a relationship between the occurrence of stiffness, fatigue and discomfort with the BMI index in dentists. With the increase in the number of years of work, the frequency of reporting pain in the lower part of the spine increased. Prudhvi et al. [20] noticed an increase in the frequency of back pain in proportion to age and body weight.

Prasad et al. [31] noted a correlation between work experience in the dentist's profession, the number of patients admitted during the day, the length of breaks between patients and the number of relaxing exercises performed during them with the risk of back pain.

In the author's own material, people who used medical care had higher cumulative results for NDI and ODI indices, and thus worse functional capacity, the results were similar in those attending physiotherapy. Also the data of Hodacova et al. [1] show that dentists suffering pain of high or moderate intensity as a result of disorders of the musculoskeletal system used medical advice and used kinesiotherapy much more often than dentists with lower intensity of pain. In turn, Sharma et al. [22] stated that a significant proportion of dentists benefited from medical advice, and slightly fewer reported to physiotherapeutic consultations and consulted on work ergonomics.

In our material, the position at work and physical activity did not differentiate the results of NDI and ODI. Also, Prasad et al. [31] found no correlation between the frequency of pain in dentists with the position taken during work. In turn, Hodacova et al. [1] concluded that working in the lateral position strongly overloads the spine, increasing the risk of pain in the spine, while the position in the rear access position, i.e. behind the head, lying behind the patient's back, is more ergonomic and ensures better positioning of the spine and even load on the musculoskeletal system.

To sum up, it should be stated that the work of dentists is demanding from the point of view of the need to maintain a comfortable, and at the same time ergonomic, position of the body. Negligence and errors in this respect may have consequences in the form of diseases of the musculoskeletal system. This should requires action in the form of implementing health promotion programs among health professionals. Dentists should be trained in the ways of using the principles of ergonomics at work and the prevention of spine diseases. This is especially important in the early stages of work. A good solution would be to create programs disseminating the need to reliably observe the principles of ergonomics in the profession of a dentist and to issue brochures containing exercises that should be performed by dentists in order to prevent disability resulting from back pain.

Conclusions

1. The principles of work ergonomics were reliably followed by only 4% of the surveyed dentists, and 82% believed that they followed these rules to some extent. Physical activity in their free time was undertaken by 78% of the respondents, most often for two weeks. Walks were the preferred form of activity.
2. Spinal pain in most of the surveyed dentists occurred every day and concerned the lumbar part of the spine. The appointments at the physiotherapist were used much more often than medical care. Massage was the most common form of therapy. Most dentists have reported improved functional performance as a result of physiotherapy.
3. The vast majority of dentists had minimal disability. Age, body composition, length of service as a dentist, and number of working hours per day showed no correlation with the results of NDI and ODI.

4. People who used medical care had higher cumulative results for NDI and ODI indices, and therefore worse functional capacity, while those who attended physiotherapy had similar results. Working position and physical activity did not differentiate between NDI and ODI scores.

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