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The influence of income on the frequency of visits to a dentist and health of the oral cavity of examined patients

Wpływ dochodu na częstość wizyt w gabinecie stomatologicznym a stan zdrowia jamy ustnej badanych pacjentów

INTRODUCTION

Results of modern socio-economic researches show higher influence of social, economic, organizational and cultural determinants than personal conditionings on oral cavity health. Economic conditionings are perceived as superior to the previously listed determinants. In majority of countries where political transformation has taken place and the annual spending on health care were couple times lower than in developed countries, oral cavity health state of inhabitants is considered by WHO as equally low. Socio-economic status and strictly related variable such as place of living are the strongest determinants which were determined in Poland [12].

In many highly developed countries medical care, available to all citizens, covers prevention and treatment of diseases, both in private and public sectors [3, 4, 6, 7, 14]. In the countries of Central and Eastern Europe, as a result of political system transformation processes and organisational changes in National Health Service, a growing number of citizens have a limited access to private health care, mainly because of economic reasons [15].

Huge barrier in accessibility to health care pose high costs of dental services [1]. Statistically significant influence of funding method of health care services on both type of provided dental services and dissemination of observed diseases is noticeable [9].

Dentistry as a vibrant branch of medicine makes use of many modern technologies, from diagnostics (3D RTG), treatment with newest materials and laser therapy, to full teeth restoration i.e. implant prosthetics. All of the above modern methods are very expensive, due to the participation of wide scope of specialists: doctors, hygienists, dental technicians, radiologists etc. Additionally, the treatment uses expensive medical equipment, microscope, information technology etc. Patient willing to undertake wide range of dental services must be prepared for the high costs of it, which can be a barrier in accessing the treatment.

MATERIAL AND METHOD

The research was conducted in 2012-2013 on 180 randomly chosen adult patients (aged between 35 and 44 years), both sexes living in a big city (over 100.000 inhabitants), in smaller cities (under 100.000 inhabitants) and in villages West Pomerania region. The analysis included dental examination of teeth status of adult patients, prevalence of caries and evaluation of oral hygiene and was conducted among patients undertaking private dental treatment or treatment reimbursed by the National Health Fund. The research was approved by Ethics Committee by Regional Medical Council in Szczecin.

Clinical examination included use of non-invasive and secure diagnostic methods such as using a WHO scale probe and dental mirror under the artificial light. Lamp for polymerization of the fillings was also used to evaluate the cavities on teeth contact areas.

The study was based on an anonymous survey, including single and multiple choices close-ended and open-ended questions.

Following WHO recommendation, the research determined most important socio-economic determinants of chosen groups of patients, also evaluated socio-demographic characteristics such as: gender and place of living. Socio-economic status and education – factors acknowledged as one of the socio-medical indicators of health – were subject of the research.

Results of the survey allowed to evaluate patients' behaviours helping in oral disease prophylaxis, determine main factors influencing undertaking the dental treatment especially including psycho-emotional and socio-economic conditionings of using health care.

STATISTICAL ANALYSIS METHODS

In this paper, statistical analysis was performed on the basis of chi-square distribution. Null hypothesis was stated about the independence of analysed variables. Discontinuous variables were described by quantity and prevalence. To confirm the results statistics were calculated with Pearson's χ^2 test and independent sample t-test. General statistical measures such as mean, standard deviation, minimum and maximum were calculated. Results were put in tables with number of degrees of freedom

(df) and test probability (p). Alternative hypothesis ought to be assumed if test probability were lower than statistical significance. When this probability was higher than statistical significance level, there were no foundations to reject the null hypothesis. In conducted analyses the level of significance α=0,05 was chosen. Auxiliary calculations were performed in MS Excel 2007. For statistic calculations SOFA software was used.

RESULTS

Tab. I. Gender of surveyed patients

Gender	N	%
women	90	50.00
men	90	50.00
total	180	100.00

Ninety women and 90 men took part in the examination.

Tab. II. Place of living of surveyed patients

Place of living	Gender		Total
	women	men	
big city	30	30	60
smaller cities	30	30	60
villages	30	30	60
total	90	90	180

Sixty patients (30 women and 30 men) live in big city, 60 patients (30 women and 30 men) live in smaller cities and 60 patients (30 women and 30 men) live in villages.

Tab. III. Education of surveyed patients

Education	N	%
primary	6	3.59
vocational	34	20.36
secondary	62	37.13
higher	65	38.92
total	167	100.00

Among 180 patients, 167 have given information on their education. The majority of patients has higher (65 patients) and secondary (62 patients) education. Vocational education was selected by 34 patients, and primary – by 6.

Tab. IV. Income of surveyed patients

Income	N	%
up to 300 PLN	3	1.67

Income	N	%
301-500 PLN	16	8.94
501-800 PLN	38	21.23
801-1200 PLN	39	21.79
1200 PLN and more	83	46.37
total	179	100.00

Of 180 patients, 179 have given information on their income. Majority of examined patients have income of 1200 PLN and more. The income between 801-1200 PLN was declared by 39 patients, whereas 38 patients have income of 501-800 PLN. Among examined patients, 16 people declared income of 301-500 PLN, and 3 patients declared income of up to 300 PLN per person in a household.

Tab. V. Income in relation to gender of surveyed patients

Income	Gender			
	women		men	
	N	%	N	%
up to 300 PLN	3	3.4	0	0.0
301-500 PLN	12	13.5	4	4.4
501-800 PLN	24	27.0	14	15.6
801-1200 PLN	21	23.6	18	20.0
1200 PLN and more	29	32.6	54	60.0
total	89	100.0	90	100.0

Only among women were patients with income of up to 300 PLN. Women showed to have lower income than men. Significantly more men than women have income of 1200 PLN and more.

Tab. VI. Results of chi-distribution: income in relation to gender of surveyed patients

Statistic	Result	df	p
Pearson's correlation	17.387	4	0.002

Results of chi-square distribution prove that there is a statistically significant correlation ($p<0.05$) between income and gender of surveyed patients.

Patients were asked the question "How often do you visit the dental office". The answers of women and men, and inhabitants of big city, smaller cities and villages have been compared.

Tab. VII. Frequency of visiting the dental office in relation to gender and place of living

How often do you visit dental office?	Gender				Place of living					
	women		men		big city		smaller cities		villages	
	N	%	N	%	N	%	N	%	N	%
regularly	56	62.2	49	54.4	43	71.7	29	48.3	33	55.0
irregularly	34	37.8	41	45.6	17	28.3	31	51.7	27	45.0
total	90	100.0	90	100.0	60	100.0	60	100.0	60	100.0

Patients were able to choose one of 4 possible answers: always, when something worries me, regularly, at least twice a year, once a year or less often, only in case of pain. First two answers have been summed up and labeled as regularly, whereas following two were summed up and labeled as irregularly, regarding the frequency of visits in dental office. Women more often than men show proper health behaviours. Patients from big city by a large margin most often visit dental office regularly, comparing with other patients. Patients from smaller cities most often among all patients visit dental office irregularly.

Tab. VIII. Results of chi-distribution: frequency of visiting the dental office in relation to place of living

Statistic	Result	df	p
Pearson's correlation	7.131	2	0.028

Results of chi-square distribution prove that there is a statistically significant correlation ($p<0.05$) between frequency of visiting the dental office for dental examination and place of living.

Tab. IX. Frequency of visiting the dental office in relation to income

How often do you visit dental office?	Income									
	up to 300 PLN		301-500 PLN		501-800 PLN		801-1200 PLN		1200 PLN and more	
	N	%	N	%	N	%	N	%	N	%
regularly	3	100.00	6	37.50	16	42.11	25	64.10	55	66.27
irregularly	0	0.00	10	62.50	22	57.89	14	35.90	28	33.73
total	3	100.00	16	100.00	38	100.00	39	100.00	83	100.00

The lower the income of the examined patients the more irregularly patients visit the dental office.

Tab. X. Results of chi-distribution: frequency of visiting the dental office in relation to income

Statistic	Result	df	p
Pearson's correlation	11.819	4	0.019

Results of chi-square distribution prove that there is a statistically significant correlation ($p<0.05$) between frequency of visiting the dental office for dental examination and income.

The differences in the oral cavity status of patients for whom the income does or does not have the influence on the frequency of visits have been examined.

Tab. XI. Influence of income on the frequency of the visits to the dentist in relation to mean number of teeth (T), mean DMF and mean DTI

Does your income have an influence on the frequency of visits to the dentist?	Mean number of teeth	Mean DMF	Mean DTI
yes	26.2	17.1	0.7
no	28.9	14.4	0.8

Patients for whom the income have the influence on the frequency of visits have lower mean number of teeth, lower mean value of DTI and higher mean of DMF.

Tab. XII. Results of independent samples t-test: influence of income on the frequency of the visits to the dentist in relation to mean number of teeth (T)

Statistic	Result	df	p
Independent Samples t-test	-2.991	178	0.003

Results of independent samples t-test prove that there is a statistically significant correlation ($p<0.05$) between influence of income on the frequency of the visits to the dentist and mean number of teeth.

Tab. XIII. Statistical measures: influence of income on the frequency of the visits to the dentist in relation to mean number of teeth (T)

Group	N	Mean	CI 95%	Standard Deviation	Min	Max	Skew	p abnormal
yes	116	26.233	25.054 - 27.411	6.477	0.0	32.0	-1.669	< 0.001
no	64	28.859	27.966 - 29.753	3.647	18.0	32.0	-1.217	< 0.001

Tab. XIV. Results of independent samples t-test: influence of income on the frequency of the visits to the dentist in relation to mean DMF

Statistic	Result	df	p
Independent Samples t-test	2.827	178	0.005

Results of independent samples t-test prove that there is a statistically significant correlation ($p<0.05$) between influence of income on the frequency of the visits to the dentist and mean DMF.

Tab. XV. Statistical measures: influence of income on the frequency of the visits to the dentist in relation to mean DMF

Group	N	Mean	CI 95%	Standard Deviation	Min	Max	Skew	p abnormal
yes	116	17.052	15.910 - 18.193	6.273	5.0	32.0	0.392	0.132
no	64	14.406	13.059 - 15.754	5.500	5.0	32.0	0.920	0.001

Tab. XVI. Income in relation to influence of income on the frequency of the visits to the dentist

Income	Does your income have an influence on the frequency of visits to the dentist?			
	yes		no	
	N	%	N	%
up to 300 PLN	2	1.7	1	1.6
301-500 PLN	14	12.2	2	3.1
501-800 PLN	32	27.8	6	9.4
801-1200 PLN	28	24.3	11	17.2
1200 PLN and more	39	33.9	44	68.8
total	115	100.0	64	100.0

Majority of patient indicate that the income has an influence on the frequency of visits to the dentist. Patients, whose income is lower than 1200 PLN, significantly more often indicate the influence of their income on the frequency of visits to the dentist. Comparison of patients in the group of the highest income (1200 PLN and more) has showed that there is two times higher percentage of patients for whom income has no influence on the frequency of the visits to the dentist.

Tab. XVII. Results of independent samples t-test: income in relation to influence of income on the frequency of the visits to the dentist

Statistic	Result	df	p
Pearson's correlation	22.097	4	<0.001

Results of independent samples t-test prove that there is a statistically significant correlation ($p<0.05$) between income and influence of income on the frequency of the visits to the dentist.

Tab. XVIII. Frequency of visiting the dental office in relation to periodontal status (CPITN) and income

How often do you visit dental office?	regularly						irregularly					
CPITN	Healthy		Pocket >=6mm		Excluded sextant		Healthy		Pocket >=6mm		Excluded sextant	
Income	N	%	N	%	N	%	N	%	N	%	N	%
up to 300 PLN	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
301-500 PLN	0	0.00	0	0.00	0	0.00	1	10.00	0	0.00	0	0.00
501-800 PLN	1	6.25	0	0.00	0	0.00	1	4.55	0	0.00	1	4.55
801-1200 PLN	7	28.00	1	4.00	0	0.00	2	14.29	2	14.29	0	0.00
1200 PLN and more	20	36.36	2	3.64	0	0.00	5	17.86	0	0.00	0	0.00

The higher the income of the examined patients, the better is their periodontal status, regardless of the frequency of visiting the dental office.

Tab. XIX. Delaying visits to the dentist in relation to influence of income on the frequency of the visits to the dentist

Have you ever delayed a visit to the dentist?	Does your income have an influence on the frequency of visits to the dentist?			
	yes		no	
	N	%	N	%
yes	74	63.8	24	37.5
no	42	36.2	40	62.5
total	116	100.0	64	100.0

Majority of patients who have delayed visit to the dentist (63.8%) have indicated that the income has an influence on the frequency of visits to the dentist.

Tab. XX. Results of independent samples t-test: income in relation to influence of income on the frequency of the visits to the dentist

Statistic	Result	df	p
Pearson's correlation	11.496	1	<0.001

Results of independent samples t-test prove that there is a statistically significant correlation ($p<0.05$) between delaying visits to the dentist and influence of income on the frequency of the visits to the dentist.

DISCUSSION

Many authors [11, 13] stress the significant influence of socio-economic factors on oral health status and the number of teeth. Hamaska et al. [5] proved that patients with lower education and low income more often extract their teeth than patients with higher education which is also connected with the higher income. Income also influences the frequency of visits to the dentist.

Particular components of socio-economic status such as income, occupation or education, connected to each other influence the health. One's education has a significant influence on choosing the health attitude. According to research conducted in developed countries across the Europe education is a stronger indicator of health status than income. Research conducted by Ostrowska proved higher role of education than income in realization of health oriented attitudes [10].

Creating proper patients' attitudes towards care for oral hygiene and systematical dental examinations can be induced by increasing health awareness related to oral health. According to research conducted by Boczkowski most patients (43.10% - 25 people) visit the dental office sporadically, whereas 29.31% (17 people) once a year and 27.59% (16 people) once every half a year [2]. According to Bałczewska around half of the patients (54.3%) admitted to visiting the dental office once every half a year. Similarly in research by Mielnik-Błaszczak most of the surveyed patients visit the dental office every 6 months or less often (between 64.86% and 72.50%) [8].

The research showed that patients from big city most often visit dental office regularly, comparing with other patients. Patients from smaller cities most often among all patients visit dental office irregularly.

It was noticed that the lower the income of the examined patients the more irregularly patients visit the dental office.

The higher the income of the examined patients, the better is their periodontal status, regardless of the frequency of visiting a dental office.

CONCLUSIONS

- Women more often than men show proper health behaviours.
- Patients from smaller cities most often visit dental office irregularly.
- The lower the income of the examined patients the more irregularly patients visit the dental office.
- Patients whose income has an influence on the frequency of visits have lower mean number of teeth and lower mean value of DTI.
- The higher the income of the examined patients, the better is their periodontal status, regardless of the frequency of visiting a dental office.

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ABSTRACT

The aim of the work was to determine if the income of patients has an influence on the frequency of visiting dental office, and does it reflect on the health of the oral cavity. The research was conducted in 2012-2013 on 180 randomly chosen adult patients (aged between 35 and 44 years), both sexes living in a big city (over 100.000 inhabitants), in smaller cities (under 100.000 inhabitants) and in villages. The analysis included dental examination of teeth status of adult patients, prevalence of caries and evaluation of oral hygiene. It was noticed that the lower the income per person in a household, the lesser the regularity with which patients visit the dental offices. The lack of regularity in visiting dental offices reflects negatively on health status of the oral cavity. People showing improper health behaviours had lower mean number of teeth and lower mean value of DTI.

STRESZCZENIE

Celem pracy była ocena wpływu dochodu pacjentów na częstość wizyt w gabinecie stomatologicznym oraz ocena stanu zdrowia jamy ustnej. Badanie było prowadzone w latach 2012-2013 wśród 180 losowo wybranych pacjentów w wieku 35-44 lata, obu płci, zamieszkujących duże miasto (powyżej 100 000 mieszkańców) oraz mniejsze miasta (poniżej 100 000 mieszkańców) i wsi. Pacjentów poddano badaniu stomatologicznemu w celu ustalenia stanu zdrowia jamy ustnej i poziomu higieny. Ponadto przeanalizowano zachowania związane z utrzymaniem higieny i zdrowiem jamy ustnej. Stwierdzono, że im mniejszy dochód na jedną osobę w gospodarstwie domowym, tym mniejsza regularność zgłaszania się do gabinetu stomatologicznego. Brak regularności wizyt negatywnie wpływa na stan zdrowia jamy ustnej. U osób wykazujących nieprawidłowe zachowania zdrowotne zauważono mniejszą średnią liczbę zębów i mniejsze DTI.

Artykuł zawiera 20838 znaków ze spacjami