

Some aspects of preparing diabetic patients for self-care

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Abstract

Background

Diabetes is a lifestyle disease which can cause many complications and organ-related disorders. The aim of the study was to analyze selected aspects of preparing patients with diabetes for self-care.

Methods

The study group consisted of 190 people diagnosed with type 1 and type 2 diabetes, including 101 women and 89 men. The mean age of the respondents was 42.2 ± 13.4 years. The study was conducted using an anonymous self-designed questionnaire containing 50 questions.

Results

Among the respondents, 23.2% did not control their glucose levels at home. The respondents most often measured glucose once a day (33.6%) or three times a day (26.7%). 64.7% of the respondents declared that they kept a self-monitoring diary. The knowledge of the symptoms of hypoglycemia and the ability to properly manage it was declared by 64.8% of the respondents. 52.1% of the patients did not undertake any activity lasting more than 30 minutes at least 3 times a week. 75.2% described their condition as very good and good. Independent participation in therapy, i.e. taking hypoglycemic drugs or insulin, was declared by 63.7% of the respondents.

Conclusions

Despite undergoing therapeutic education, the study population diagnosed with diabetes still show deficiencies in terms of awareness of proper health behaviors. Objective results showed that the patients had insufficient knowledge and skills in terms of self-care and self-observation, blood glucose and blood pressure measurements, physical activity, diet therapy and adherence to pharmacotherapy recommendations. Despite the good general preparation for self-care as declared by the respondents, these patients require further systematic, individual educational activities.

Study implications

The results of the present study have implications for nursing practice, patient therapeutic education, and the functioning of the public health and healthcare systems. The number of diabetic patients is constantly increasing. Patients require coordinated care and individualized therapeutic education in order to be prepared for self-care and self-management, thus reducing the risk of complications. Delaying the occurrence of potential complications provides patients with a chance to live an active private and professional life, and protects the health care system from carrying the cost burden of expensive highly specialized services.

Background

According to the World Health Organization, diabetes is a non-communicable lifestyle disease. Data provided by the Organization for Economic Co-operation and Development (OECD) and the European Commission shows that the number of diabetics worldwide is gradually increasing. In 2014, this diagnosis concerned 422 million adults worldwide. The forecast for 2035 predicts a considerable increase in the incidence of diabetes - 591.9 million cases. The highest incidence rates are observed in highly developed countries, in both Americas and Europe. In 2014, there were 64 million adult diabetics in Europe, while for Poland the latest data indicate about 3 million cases [1,2,3].

Diabetes mellitus is a chronic, progressive disease that carries many complications and organ burdens. Clinical experts have developed a consensus on the care of patients with diabetes. The standard of patient care is recommended for the diagnosis of diabetes, pharmacological and dietary treatment, as well as early and late prevention [4,5]. It is consistent with the guidelines adopted by the Polish Diabetes Society [6].

Diabetes care requires appropriate competencies to be demonstrated by the entire therapeutic team. It includes several interrelated components: pharmacotherapy, behavioral therapy (diet, exercise), specialist consultations to assess metabolic control and the severity of late complications, education in lifestyle modification, and psychological support. Care should be patient-centered, taking into account their individual circumstances, abilities, needs and preferences. It is also necessary for specialists from related fields to cooperate as part of coordinated care due to the multidirectional nature of diabetes complications and comorbidities [6,7,8].

In modern nursing, the care of the chronically ill focuses on preparing the patient for living with the disease, for self-management and self-care – as defined by Dorothea Orem's theory – with emphasis on personal responsibility for one's health [9, 10]. Preparation for self-care is one of the factors that determine the functioning of a chronically ill person, as it affects the patient's ability to face the disease and to deal with new or difficult situations arising from it. It is an important trend in modern nursing care, based on the expectation that the patient will take responsibility for themselves, for the results of treatment, for adherence to therapeutic recommendations, and for modifying their own lifestyle. The disease and the resulting limited efficiency might result in the patient developing a kind of inability to be provided with the full range of care or in deficits in this regard. The multifactorial determinants of diabetes, its type, duration, age of the patient and their mental and physical condition as well as broadly understood environmental conditions significantly shape the course of therapy [11, 12, 13].

The aim of the study was to analyze selected aspects of preparing patients with diabetes for self-care.

Material And Methods

The study group consisted of 190 people diagnosed with type 1 and type 2 diabetes, including 101 women and 89 men. The study was carried out at the Multispecialist Health Center "GRYF-MED" at 46 Wojska Polskiego Street in Bydgoszcz and at the Endocrinology and Diabetology Clinic of the Dr Antoni Jurasz University Hospital no.1 in Bydgoszcz at 9 Marii Skłodowskiej-Curie Street in Bydgoszcz.

Inclusion criteria for the study were as follows:

- clinically diagnosed type 1 diabetes or type 2 diabetes,
- age of 18 years or older,
- consent to voluntary participation.

The study was conducted with the use of an anonymous, self-designed questionnaire containing 50 questions providing basic information about socio-demographic factors and the disease entity, as well as lifestyle, applied methods of treatment and medical care.

Paper questionnaires were handed over in person and completed in the presence of the author.

The study was carried out in accordance with the Declaration of Helsinki. The protocol of the study was approved by the Bioethics Committee of the Nicolaus Copernicus University Collegium Medicum in Bydgoszcz, Poland (consent no. KB 362/2017). The survey was anonymous.

Statistical analysis was performed using the Statistica v. 10 software and the Excel spreadsheet (StatSoft, Poland, Kraków). Basic qualitative (nominal) data were presented as the population size (n) and percentage (%). The significance of correlations between qualitative variables was verified using the Pearson's chi-square test at the level of $p < 0.05$. Measurable (quantitative) variables were presented as mean and standard deviation ($M \pm SD$). For variables with non-normal distribution, the median and range were given. Analysis of variance was used to determine the significance of differences between more than two groups.

Results

Table 1 presents the general characteristics of the study group, which included 101 women and 89 men. The mean age of the respondents was 42.2 ± 13.4 years. The oldest respondent was 72 years old and the youngest was 18 years old. Most of the respondents (70.5%) were city residents. Education was completed at the secondary level by 70 respondents (36.8%), vocational – 121 (63.7%), higher – 43 (22.6%) and primary – 18 (9.5%). More than half of the respondents, 121 people (63.7%), were economically active, 27 (14.2%) received retirement or disability benefits, 18 (9.5%) were students and 24 (12.6%) were unemployed. Every fifth respondent (20.5%) lived alone. Among the respondents, 72.6% were patients with type 2 diabetes. The mean time from diagnosis of diabetes was 7.7 ± 5.7 years. In the study group, 87 patients (45.8%) declared the presence of comorbidities. When answering the question about the type of comorbidities, the respondents selected several statements; 122 responses were recorded from 87 people in total. Most respondents indicated the presence of arterial hypertension – 45 people, which accounted for 36.9% of all the statements selected. Further, the respondents indicated asthma – 17 people (13.9%), obesity – 10 people (8.2%), hypothyroidism – 7 people (5.7%) and rheumatism – 5 people (4.1%).

Table 1. The general characteristics of the study population

Demographic characteristics of respondents	Group size n = 190 (%)
Sex	
male	89 (46.8 %)
female	101 (53.2 %)
Age (in years)	
up to 30	49 (25.8%)
31–40	36 (18.9%)
41–50	44 (23.2%)
over 50	61 (32.1%)
Place of residence	
country	56 (29.5%)
city	134 (70.5%)
Education	
primary	18 (9.5%)
vocational	59 (31.1%)
secondary	70 (36.8%)
higher	43 (22.6%)
Business activity	
unemployment	24 (12.6%)
full-time job	121 (63.7%)
disability pension/retirement	27 (14.2%)
pupil/student	18 (9.5%)
Living	
with family	151 (79.5%)
alone	39 (20.5%)
Co-existing diseases	
hypertension	45
asthma	17
obesity	10

hypothyroidism	7
rheumatism	5
Type of diabetes	
type 1	52 (27.4%)
type 2	138 (72.6%)

It is extremely important for patients with diabetes to monitor their glucose levels at home. Among the respondents, 23.2% did not control their glucose levels at home, while the vast majority (76.8%) declared that they self-measured their glucose levels. Every fifth respondent (21.1%) indicated the need to use the help of another person when measuring blood glucose. 65.8% of the respondents reported that relatives assisted them in measuring glycemia. The respondents most often measured their glucose levels once a day (33.6%) or 3 times a day (26.7%), and only a slightly smaller group – twice a day (26.0%) (Table 2).

Table 2. Frequency of measuring blood glucose levels

Frequency	n	%
5x a day	1	0.7
4x a day	10	6.8
3x a day	39	26.7
2x a day	38	26.0
1x a day	49	33.6
every 2 days	3	2.1
1x a week	6	4.1
Total	146	100.0

Measurements of glycemia and arterial pressure can be used for keeping a self-care diary, in which the said values are regularly recorded. Managing a self-care diary was reported by 64.7% of the respondents.

For diabetic patients, an important skill is to observe the organism for potential glyceemic disorders (hypoglycemia, hyperglycemia) and to react accordingly. Knowledge of the symptoms and methods of management of hypoglycemia was declared by 64.8% of the participants. At the same time, knowledge related to hyperglycemia symptoms was declared by 65.8% of the patients, and of methods for its management – 63.7%. Despite being aware of the symptoms of glyceemic disorders, 4.7% of the respondents experienced acute hyperglycemia and 6.3% – acute hypoglycemia within 6 months before

the study. Most patients (70.7%) declared their participation in education programs preparing chronically ill patients to live with diabetes, organized and managed by competent healthcare professionals: diabetes doctors and nurses, family doctors and nurses, as well as dieticians. Moreover, every third respondent (29.3%) learned about diabetes from other sources, such as the Internet, books journals, television, friends. The majority of the patients (75.8%) declared that they had sufficient knowledge and skills needed to manage self-care in diabetes. Despite such a high number of respondents declaring satisfactory knowledge and skills, negative health behaviors were still displayed by the patients. Smoking cigarettes applied to 43.2%, while alcohol consumption ranging from mild to severe was declared by as many as 86.8% of the respondents. Half of the study population (53.5%) reported using stimulants other than cigarettes or alcohol. When asked about the type of other stimulants used, the respondents marked several statements: 121 answers were given by a total of 107 patients (the rest did not indicate any stimulants). Among the respondents, 82.6% declared the consumption of coffee, and 16.5% – of energy drinks.

What is more, the respondents reported not being engaged in sufficient physical activity. As many as 52.1% failed to take exercise lasting over 30 minutes at least three times a week. Three patients (1.6%) declared being engaged in at least 150 minutes of physical activity per week. The remaining respondents (46.3%) undertook physical activity sporadically.

Most of the patients (73.7%) declared suffering from stress, while every third respondent (31.5%) reported that they were able to cope with stress situations.

The respondents were asked to self-assess their health status. As many as 75.2% of the patients described their condition as very good or good (Figure 2).

For patients with a chronic disease such as diabetes, the key issue is pharmacotherapy, in which they should actively participate. Pharmacotherapy is individually prepared for each patient, taking into account their clinical condition, capacity, fitness and physical activity, daily efficiency and functional activity, as well as living conditions. Independent participation in therapy, i.e. taking hypoglycemic drugs or insulin, was declared by 63.7% of the respondents. Among patients who were dependent in their pharmacotherapy, 7.9% required constant assistance of other people. Among 76 patients treated with subcutaneous insulin, 76.3% reported self-preparation and self-injection. All patients using insulin pumps (39) were independent in the use of the equipment thanks to instructions with which they had been provided.

As mentioned above, 45.8% of the respondents were diagnosed with other diseases accompanying diabetes (multi-morbidity) and were subject to combination therapy, including complex treatment regimens. In this group, every fourth patient (27.4%) reported experiencing various ailments associated with taking medications other than hypoglycemic drugs, and every second patient (51.9%) reported that they stopped taking medications when ailments occurred.

Discussion

Contemporary models of care for patients with chronic diseases such as diabetes focus on preparing them for self-care. Patients diagnosed with type 1 diabetes should be aware that it is an incurable disease that requires continuous pharmacotherapy and insulin administration. Patients diagnosed with type 2 diabetes should be made aware that the course and progression of the disease, optimization of glycemia, and intensity of symptoms depend on their decisions and individual health behaviors [12, 14-16].

A diabetic patient prepared for self-care is a patient who has a certain amount of knowledge and specific skills. In terms of knowledge, it is necessary to understand the nature of the disease, its pathophysiology, metabolic changes, symptoms, state of hyper and hypoglycemia as well as pharmacological and non-pharmacological methods of treatment. A patient with diabetes should learn the skills of self-observing the symptoms, using a glucometer, administering insulin (pen, insulin pump), using a blood pressure measuring device, performing a urine strip test for ketone bodies and adjusting their menu to daily requirements [6].

Due to the course and duration of the disease as well as the impact of the patient's health behavior on the risk of late complications and treatment costs, the International Diabetes Federation has developed guidelines for patient care and prevention of diabetes [5], which are consistent with the position of the Polish Diabetes Society [6]. It emphasizes that the preparation of the patient for self-care and self-management takes place through education that is individualized, focused on the patient, and taking into account their clinical condition, perceptual abilities and environmental conditions. Education of a diabetic patient should be comprehensive and carried out by a competent team. It should also be combined with behavioral therapy, which aims to correct health behaviors. An inseparable element of education is psychological support provided to the patient, focused on encouraging acceptance of a chronic disease, strengthening the motivation for optimal management in the therapy process, and shaping the patient's sense of influence on the course of the disease, while at the same time ensuring open communication with the therapeutic team. Education in the treatment of diabetic patients is of such importance that it is recommended that it involves not only diabetics themselves, but also their families and caregivers [6].

Referring to the description of a patient characterized as prepared for self-care, it is difficult to talk about full co-responsibility and active participation of the patient in the therapeutic process, since as many as 23.2% of patients included in the present study did not control their glucose levels at home with a glucometer, and every fifth respondent (21.1%) reported using the help of another person in taking this measurement. In this study, 64.7% of the respondents declared keeping a self-care diary. This result is consistent with the data presented in the report of the Coalition for Fighting Diabetes of 2017, where 58% of respondents managed a self-care diary [17].

In the present study, self-preparation and administration of oral hypoglycemic drugs or insulin was reported by 63.7% of patients. A potential lack of independence of a patient indicates the need to provide

them with physical rehabilitation, to select medical equipment adapted to their psychophysical abilities, and – in many cases – to use the support of relatives.

For patients with a chronic disease such as diabetes, it is crucial to learn about their internal resources: the sense of agency, of being able to manage the disease, of independence, and of security. These translate into the patient's independence and the ability to manage self-care. Professional psychological help makes it easier for the patient to discover their individual internal resources [18, 19].

In the treatment of people with diabetes, it is recommended to strive for modification and transition from a sedentary to a more active lifestyle with the use of all forms of activity [5, 6]. Physical activity should be undertaken regularly. Before and after exercise, it is advisable to determine blood glucose levels corrected by taking an additional portion of carbohydrates [20,21]. Although regular physical activity for at least 30 minutes is conducive to reducing the risk of cardiovascular diseases and is an important aspect of non-pharmacological treatment of diabetes, the present study showed that 52.1% of the patients did not consider it as a permanent element in their lifestyle. Only three patients (1.6%) declared systematic physical activity of about 150 minutes a week. In the National Health Test of Poles in 2020, among 401,195 respondents, the largest group of people (39%) was engaged in physical activity for up to 30 minutes a day [22].

Chronically ill patients require systematic therapy, following indications and recommendations of their physician, as well as compliance with treatment procedures in order to minimize the effects of the disease. Failure to comply with the principles of long-term therapy reduces the effectiveness of treatment, which most often leads to the patient discontinuing the therapy and, consequently, causes a greater number of complications and increases mortality. Complications reduce the patient's quality of life and burden the health care system [3,23].

The standard for the management of diabetic patients adopted by the Polish Diabetes Society provides for comprehensive patient care and is based on the assumption that compliance with this standard prevents the progression of the disease and the development of serious complications. The standard defines the educational role of the nurse in preparing the patient for self-care. Nurses working at all levels of diabetes care can contribute to organizing and delivering high-quality care for patients with diabetes. Nurses play an important role in shaping and supporting the patient's responsibility for own health through face-to-face consultations, counseling, or the provision of structured diabetes education and self-control plans [8,24,25,26].

Conclusions

1. Despite receiving therapeutic education, the study participants diagnosed with diabetes still show deficiencies in terms of awareness of proper health behaviors.
2. Objective results showed that the patients had insufficient knowledge and skills in terms of self-care and self-observation, blood glucose and blood pressure measurements, physical activity, diet therapy

and adherence to pharmacotherapy recommendations.

3. Despite the good general preparation for self-care declared by patients with diabetes, these patients require further systematic, individual educational activities. Diabetic patients and their families should be included in the education program with the aim of increasing their awareness of diabetes complications.

Declarations

Ethics approval and consent to participate

The study was carried out in accordance with the Declaration of Helsinki. The protocol of the study was approved by the Bioethics Committee of the Nicolaus Copernicus University Collegium Medicum in Bydgoszcz, Poland (consent no. KB 362/2017).

Consent for publication

Not applicable

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Conceptualization, A.P. and E.K.; Methodology, A.P. and E.K; A.M.; Writing—review and editing, A.P, A.M. and E.K. All authors have read and agreed to the published version of the manuscript.

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Figures

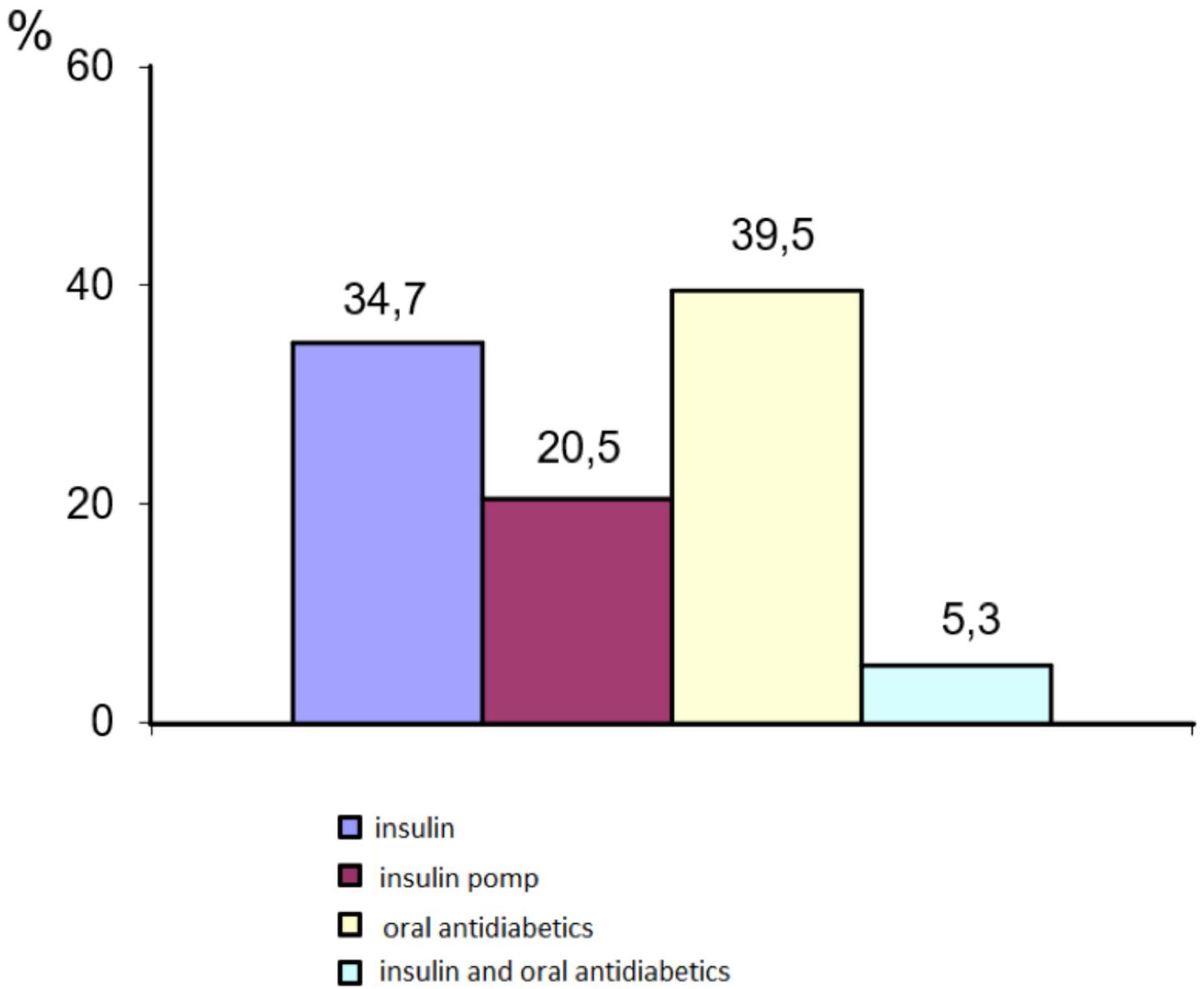


Figure 1

Applied treatment of diabetes mellitus

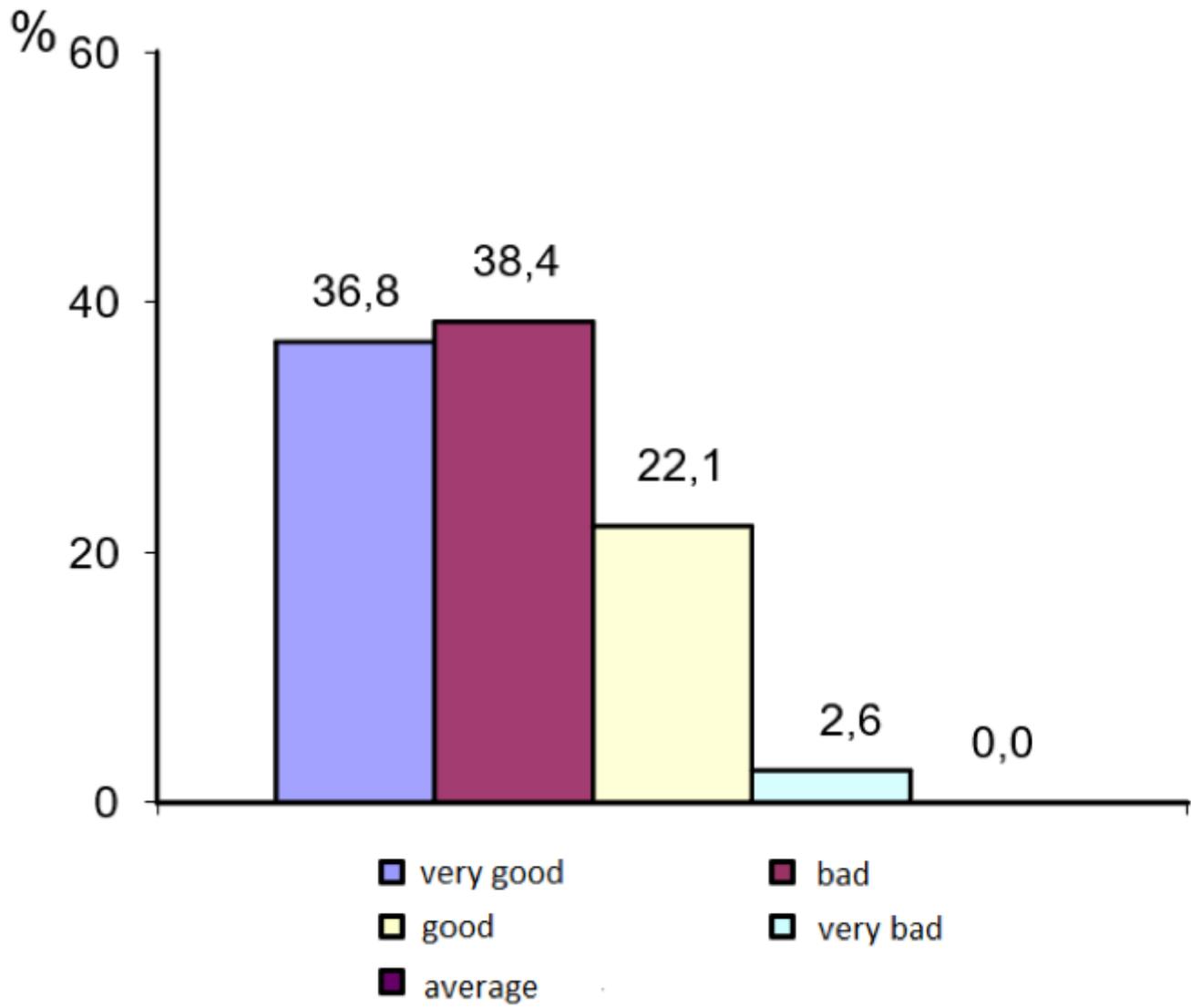


Figure 2

The respondents' self-assessment of health status