

Physical activity behaviour in patients with metabolic syndrome

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Summary

STUDY/PRINCIPLES: Physical activity improves the clinical course of the metabolic syndrome and its risk factors. The aim of this study was to investigate the physical activity behaviour in patients with metabolic syndrome in regard to the recommendation of the Federal Offices of Public Health (BAG) and Sports (BASPO): “to exercise half an hour a day at a medium intensity.”

METHODS: 47 patients with metabolic syndrome were recruited from the Outpatient Department of the Division of Internal Medicine of the University Hospital Zurich. 24 patients were included and physical activity behaviour was assessed by using the International Physical Activity Questionnaires.

RESULTS: All of the patients knew about the positive effect of physical activity on the course of the metabolic syndrome although 62% of the patients (n = 15) had no knowledge of the BAG/BASPO recommendations. 54% of the patients (n = 13) performed physical activity in accordance to the recommendation with or without knowing the recommendations. Most of the patients (n = 21, 87%) were motivated to improve their physical activity, but missing opportunities and instructions were important reasons for not being physically active.

CONCLUSION: Patients with metabolic syndrome usually know about the positive effect of physical activity on the course of their disorder and are motivated to improve physical activity behaviour. However, the BAG/BASPO recommendations are not widely known and should therefore become more popular and better communicated particularly to patients with metabolic syndrome. Furthermore, patients have to be supported and instructed practically how to get physically active in accordance with their co-morbidities.

Key words: metabolic syndrome; physical activity; BAG activity recommendations; International Physical Activity Questionnaires

Introduction

The metabolic syndrome is defined so to identify patients who are at increased risk of cardiovascular diseases or dia-

betes [1]. The latest widely recognised definition of the metabolic syndrome was published by the International Diabetes Federation (IDF) in 2005 to establish a practical definition based on the latest research findings. The IDF analysed the definitions of the World Health Organisation (WHO), the European Group for the Study of Insulin Resistance (EGIR), the National Cholesterol Education Program and Adult Treatment Panel III (NCEP ATP III) [2, 3]. In Switzerland, the definition of the Swiss Atherosclerosis Working Group (AGLA) is widely used for the diagnosis of metabolic syndrome, which resembles the IDF definition. For the diagnosis of metabolic syndrome, three of the following five criteria must be met: abdominal obesity (waist circumference: >102 cm [m], >88 cm [f]), raised Triglyceride level (TG) (≥ 1.7 mmol/l (>150 mg/dl)), reduced High Density Lipoprotein Cholesterol (HDL) (<1.0 mmol/l (<40 mg/dl) (m), <1.3 mmol/l (<50 mg/dl) (f)), raised blood pressure ($\geq 130/85$ mm Hg) and raised fasting plasma glucose (≥ 5.6 mmol/l (100 mg/dl)) [4].

The metabolic syndrome is associated with an increased risk for diabetes mellitus type 2, cardiovascular diseases and atherosclerosis complications [5, 6]. A complex genetic disposition predisposes for the syndrome, in combination with unfavourable environmental factors which promote the manifestation of the syndrome [5]. Age, pro-inflammatory state, hormonal changes and ethnic variability are co-

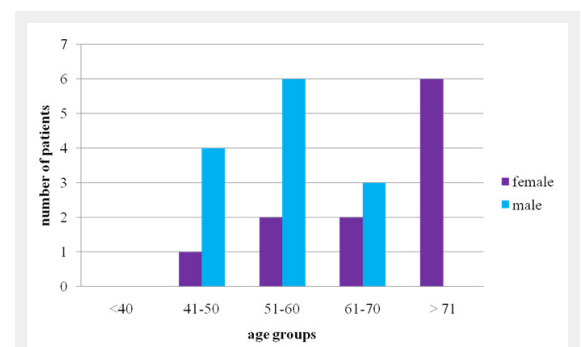


Figure 1

The distribution of the study population by age and gender. With increasing age, the amount of female participants increased, accounting for all of the participants in the age group >71 years.

factors for the development of the metabolic syndrome [7]. On the other hand adipose tissue itself releases immune and several inflammatory mediators. Based on this inflammatory milieu the metabolic syndrome may aggravate existing rheumatoid arthritis, which itself predisposes acceleration of atherosclerosis [8].

Importantly, insufficient physical activity worsens risk factors of metabolic syndrome. However, the beneficial health effects of physical activity are often neglected by physicians and the patients.

The Federal Office of Public Health (Bundesamt für Gesundheit, BAG) and the Federal Office of Sports (Bundesamt für Sport, BASPO) consider physical activity as a main part of health. In 1999, BAG/BASPO released a recommendation based on scientific studies: "Women and men in every age are recommended to exercise at a medium intensity (slightly accelerated breathing) at least half an hour a day" [9]. Insufficient physical activity causes at least 2000 deaths and 1.4 millions diseases every year in Switzerland accounting for direct treatment costs of 1.6 million Swiss Francs [10].

The aim of this study was to investigate the physical activity behaviour in patients with metabolic syndrome, to compare it with the recommendation of the BAG/BASPO for healthy people and to evaluate the motivation to start or improve physical activity.

Methods

The study was designed as master theses for the master of medicine degree of the first author and was approved by the ethic commission of the canton Zurich (KEK). All patients gave written informed consent to participate in the study. Patients were recruited from the Outpatient Department of the Division of Internal Medicine, University Hospital Zurich, Switzerland, from July 2011 to October 2011. Names of patients consulting the Outpatient Department due to metabolic syndrome were provided by treating physicians. The diagnosis of metabolic syndrome was confirmed in 47 patients meeting the AGLA-criteria of metabolic syndrome and these patients were recruited for the study. All patient data were extracted from the clinical information system (KISIM) of the University Hospital Zurich. Information concerning the person as gender, age, origin, migration

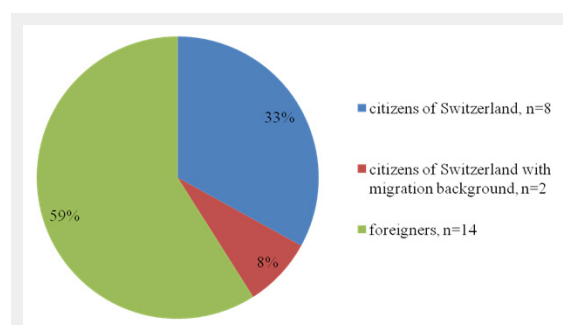


Figure 2

Origin of the participating patients. Of the study population 59% (n = 14) were foreigners (i.e., not citizens of Switzerland), 33%, (n = 8) were Swiss, two citizens of Switzerland (8%) had a migration background.

background and education level were assessed. General knowledge about the effects of physical activity, knowledge about the BAG/BASPO recommendation, individual physical activity pattern, assessment of regular physical activity, information given by the physicians and the motivation to change physical activity behaviour were assessed by using a basic questionnaire (appendix: basic questions). Physical activity behaviour was determined by using the International Physical Activity Questionnaire (IPAQ) [11]. The IPAQ assesses physical activity across a comprehensive set of domains including leisure time physical activity, domestic and gardening activities, work-related physical activities, and transport related physical activities. The activity in different physical domains of the last seven days was analysed and an average day of physical activity and exercising was determined. This average "exercise" day was compared with the BAG/BASPO recommendation. Data were assessed and recorded by the first author by telephone interview or at the hospital and double-checked by the last author. Descriptive statistical methods were used to analyse and present the results with Microsoft Excel® programme.

Results

47 patients were recruited of which 24 patients agreed to participate in the study. The number of non-participating

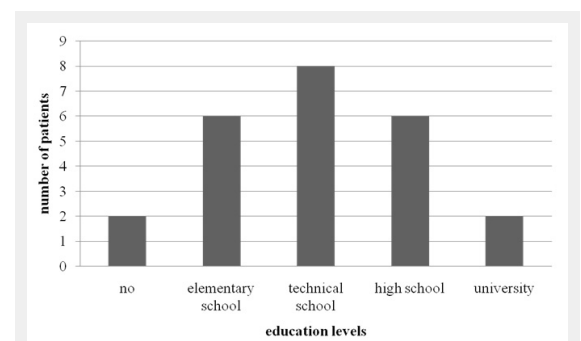


Figure 3

Education level of the participating patients. Eight patients had a high education level (high school or university degree), while most patients (n = 16) had an elementary school degree or a technical school degree.

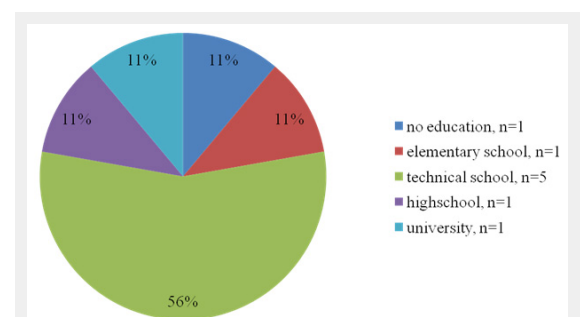


Figure 4

Knowledge of BAG/BASPO recommendation. Nine (38%) of the 24 patients knew about the BAG/BASPO recommendation: one (11%) patient was a graduate of an elementary school, 5 patients (56%) of a technical school, one patient (11%) of high school, one patient (11%) of the university and one (11%) patient had no educational background.

patients (n = 23) was high, mostly due to lack of language knowledge (n = 10) and missing motivation (n = 5). The participating study group (n = 24) included 46% (n = 11) female and 54% (n = 13) male patients. The distribution of the study population by age and gender is shown in figure 1. With increasing age, the number of female participants increased, accounting for all of the participants in the age group >71 years. Of the study population 59% (n = 14) were foreigners (i.e., not citizens of Switzerland) (fig. 2). Two citizens of Switzerland (8%) had a migration background. The remaining patients were Swiss (33%, n = 8). Eight patients (33%) had a high education level (high school or university degree), while most patients (n = 16, 67%) had an elementary school or a technical school degree (fig. 3). All 24 patients declared knowing about the beneficial health effects of physical activity of which 38% (n = 9) knew about the BAG/BASPO recommendations whereas 62% (n = 15) did not. Of the 9 patients knowing the recommendations, 3 (33%) were female, and 6 (67%) were male; 4 (44.5%) were foreigners and 4 (44.5%) were Swiss citizens, one (11%) was a Swiss citizen with migration background. In regard to education, one (11%) patient was a graduate of an elementary school, 5 (56%) of the technical school, one (11%) of high school and one (11%) of the university; one (11%) person had no educational background (fig. 4). In general patients aged 60 years or less were less aware of the recommendation than the over 60-year old patients were.

During basic question assessment half of the patients (n = 12) stated that they were “exercising” on a regular basis, subjectively lasting from minutes to several hours per day. Individual perception of exercising varied widely: some patients considered “exercising” at medium intensity as domestic activity lasting for several minutes, for example cutting grass. Others considered exercising at medium intensity while fast walking, or any exercise associated with acceleration of breathing. Some patients stated hours of “hard” physical work due to a specific physical activity programme. Based on the IPAQ evaluation, still more than half of the patients (54%, n = 13) performed physical activity and exercised according to the BAG/BASPO recommendation (female n = 7, male n = 6; foreigners n = 8, Swiss citizens n = 3, Swiss citizens with migration background n = 2). Interestingly they exercised sufficiently with or without knowledge of the BAG/BASPO recommendation. In regard to education levels 7 patients were graduates of a technical school, 3 of an elementary school, 2 of a high school and one person from the university. Comparing age groups, 3 (23%) were in the 41–50 group, 3 (23%) in the 51–60 group, 4 (31%) in the 61–70 group and 3 (23%) in >71 group.

Most of the patients (n = 21, 87%) were informed by their physician about the beneficial health effects of physical activity. No differences were found between origins and education level regarding this information aspect.

Finally most of the patients (n = 21, 87%) were motivated to improve their physical activity: woman (n = 10) equally with men (n = 11), all of the Swiss citizens (n = 8), all of the Swiss citizens with migration background (n = 2) and 79% of the foreigners (n = 11). In regard to the educational background, 86% (n = 6) of the elementary school

graduates, 89% (n = 8) of the technical school graduates, all of the high school graduates (n = 4), all of the university graduates (n = 2) and one patient without an education were motivated to improve physical activity behaviour. No differences were found between the age groups.

Discussion

This small study aimed at investigating physical activity behaviour in outpatients with metabolic syndrome. Firstly, the number of non-participating patients was high mostly due to a lack of language knowledge. Insufficient language knowledge of patients consulting Swiss hospitals or health care providers is a well known circumstance not only concerning patients with metabolic syndrome. Communication with foreign speaking patients could be improved by providing on-site translational services or involvement of e.g., German speaking relatives.

In regard to the participating patients, all were older than 40 years which corresponds to the usual age range of patients with the metabolic syndrome [5]. The percentage of foreigners in our study was high at 59% (n = 14) corresponding to a higher prevalence of the metabolic syndrome in foreigners [5]. On the other hand foreigners more often choose hospital outpatient departments for medical treatment instead of a practicing general physician. The highest education levels (high school and university graduates) were less represented in the study group which is in line with the fact that education level is associated with a healthy lifestyle and inversely related to the metabolic syndrome [10].

The knowledge about the beneficial effects of physical activity was widespread within the study population. In contrast specific knowledge about the BAG/BASPO recommendation was poor (n = 9, 39%). Among the patients performing physical activity, women and foreigners exercised more often than men and Swiss citizens, whereas technical school graduates exercised the most. This trend is unclear, one factor might be that foreigners and technical school graduates perform more physical activity during their daily work and will not exercise additionally in their free time; in contrast older women exercised more in their free time probably due to an improved understanding of their health.

Patients who exercised had different perceptions of “exercising”, lasting subjectively from few minutes to several hours per day at various intensities. Any activity might be beneficial as even low levels of physical activity are associated with a reduced mortality in patients with metabolic syndrome compared to inactivity [12]. Evaluations of the Swiss Health Interview in 1992, 1997 and 2002 revealed that the extent of physical activity habits within the general Swiss population has been overestimated so far. Only 27% of the Swiss population exercised intensively at least three times per week [10]. People living in the French- or Italian-speaking part of Switzerland are less likely to exercise than those living in the German-speaking part [10]. In our study only patients in the German-speaking part of Switzerland were included and no comparison with metabolic syndrome patients in other parts of Switzerland can be made.

People with a middle or high education level and above-average household income usually have better physical activity habits [10]. In contrast, technical school graduates exercised most in our small study. This circumstance remains unclear; an explanation might be the different perception of “exercising” and therefore an overestimation of physical activity in this very small subgroup.

Most of the participating patients were in general well informed by their physicians about the positive effects of physical activity on their metabolic syndrome. This positively reflects that health care providers pay attention to inactivity in their patients and highlight physical activity as an important instrument in the treatment of the metabolic syndrome. Still some patients had insufficient knowledge about the beneficial effects of physical activity about metabolic syndrome. Reasons for not being properly informed might be a lack of language knowledge, e.g., information was given by the physician, but the patients did not understand the message. On the other hand information was not passed on to the patient due to severe co-morbidities not allowing proper physical activity.

The high percentage of motivated patients who perform physical activity in the study group is positive. The question arises why they have not yet changed their exercise habits. Reasons for not exercising were severe co-morbidities, lack of time and money issues. Many patients claimed missing practical instructions or missing opportunities, which emphasise the need to activate programmes/facilities for patients with metabolic syndrome or with single criteria for the metabolic syndrome.

Conclusion

Patients with metabolic syndrome usually know about the positive effect of physical activity on their disorder and they are in general motivated to change their physical activity behaviour. However, the BAG/BASPO recommendations are not widely known in this study population. The BAG/BASPO recommendations should become more popular and better communicated not only to the public but to patients with metabolic syndrome. Individual ways have to be found for each patient's possibilities in regard to co-morbidities to integrate physical activity in daily life and positively influence the course of the metabolic syndrome. Furthermore patients have to be supported and instructed practically on how to get and stay physically active, and specific activity opportunities/programmes have to be provided for patients with metabolic syndrome.

Limitations

The main limitation of this study is the small number of participating patients with metabolic syndrome. Furthermore, the study was performed in a single outpatient department of a German speaking university hospital not being representative for a whole country. The results therefore can not be transferred to the wider population of Switzerland, a larger and wider ranging research would be required. For non-German speaking patients translations were made corresponding to good clinical practice, but may limit correct understanding of the IPAQ and basic questions.

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Appendix

Questionnaire with basic questions

1. Do you know about the recommendation of the Federal Office of Public Health (Bundesamt für Gesundheit, BAG) and the Federal Office of Sports (Bundesamt für Sport, BASPO): To exercise half an hour a day in a medium intensity is at least necessary to positively influence health, quality of life and physical efficiency.
 Yes / No
2. Has your general or treating physician already given you information about the positive effect of exercise on your health?
 Yes / No
3. Do you know about the positive effect of exercise on the metabolic syndrome (e.g. improving blood lipids, arterial hypertension, overweight, diabetes, mental health)?
 Yes / No
If yes, do you exercise regularly?
If no, would you participate in an exercise programme?
4. Would you change your exercise habits in the future?
 Yes / No
If yes, how would you change them?

Figures (large format)

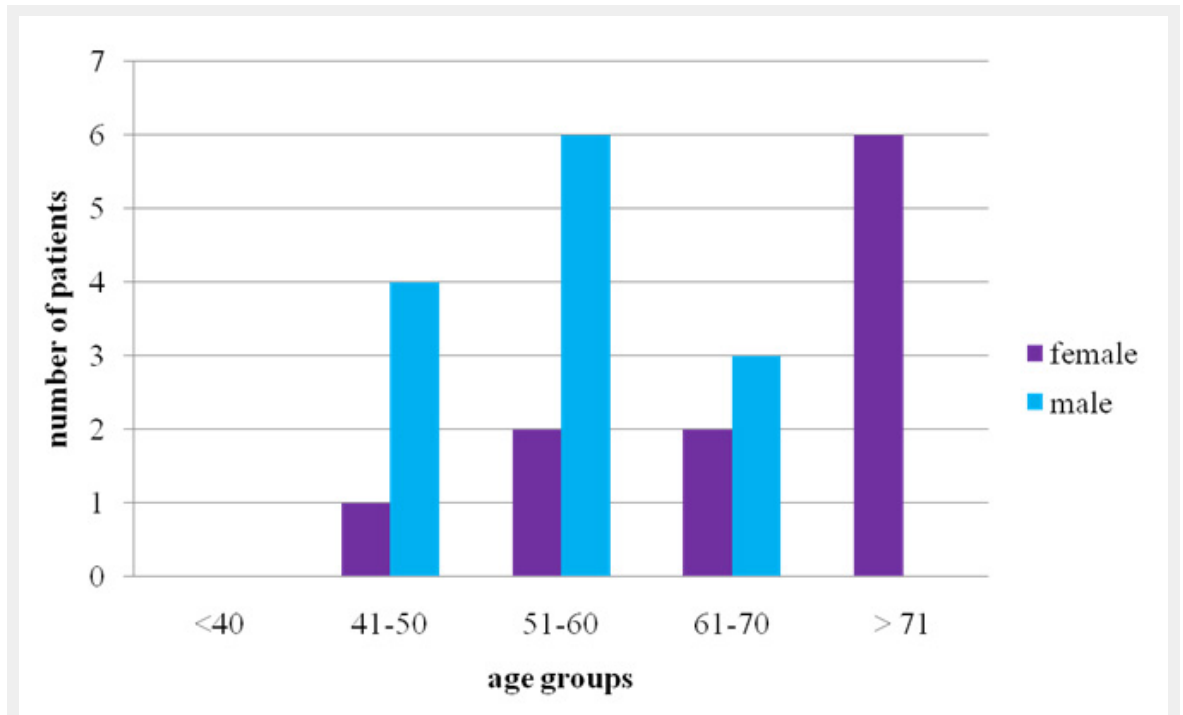


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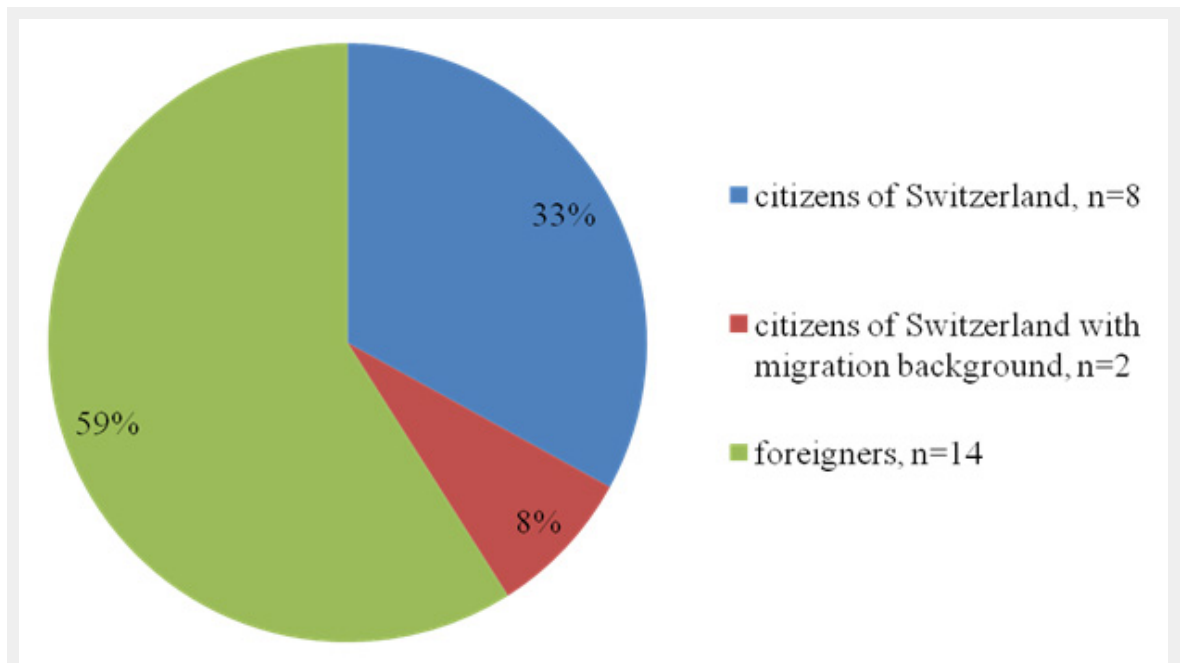


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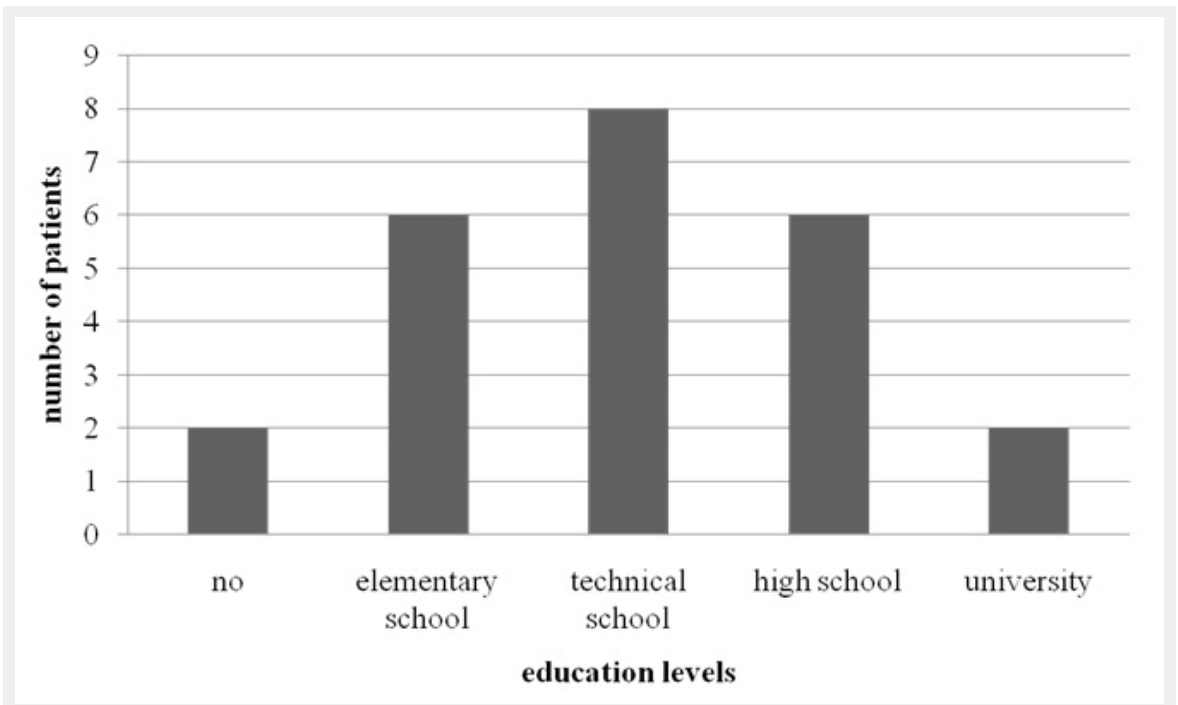


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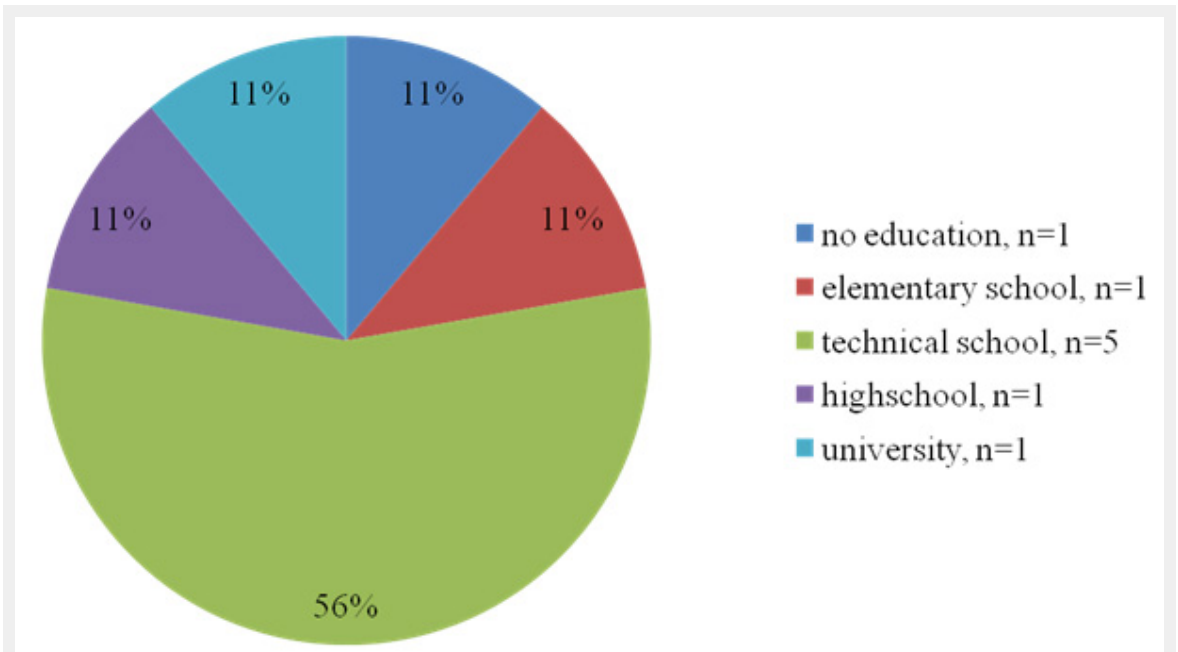


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