

Determinants of health-related behaviours of judo athletes

Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Manuscript Preparation
- E Funds Collection

Paweł Fryderyk Nowak^{1ACDE}, Cezary Kuśnierz^{1ABDE}, Karol Görner^{1AE}, Pavol Bartik^{2AE}

¹ Faculty of Physical Education and Physiotherapy, Opole University of Technology, Opole, Poland

² Faculty of Arts, Matej Bel University, Banská Bystrica, Slovakia

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Abstract

Background and Study Aim:

The fact that healthy athletes are capable of making every effort and committing themselves to the maximum extent possible proves that a healthy lifestyle is of the greatest importance to them. The aim of this paper is the relationship between the level of health-related behaviours and the participation in competitive sports and sources of knowledge on health among people practising judo, combined with a search for the factors determining the health-related behaviours.

Material and methods:

The study included 101 people practising judo. Twenty-four respondents had master grades 1-3 dan and others had student grades 5-1 kyu. A standardized research tool, i.e. the Health Behaviour Inventory (HBI) was used. For the purposes of the assessment of sources of knowledge about health and healthy lifestyle, the original questionnaire was used.

Results:

Despite the high level of health-related behaviours of the judokas (51.5% of men, 42.4% of women), their level decreases with age, progress in sport and training experience. The number of training sessions forms a factor which determines an increase of the level of health-related behaviours. The person of the coach as well as the Internet form the most common sources of knowledge regarding health, health-related behaviours, however, healthcare professionals determine the statistically significant behaviours of judo practitioners.

Conclusions:

Throughout the process of advanced level training, it is valuable to invest in a team dedicated to prepare and support competitors in particular in terms of the medical aspects of the training. Healthcare professionals form an important component of the coaching team due to the fact that they are effective educators in terms of health-related behaviours.

Key words:

combat sports • healthy lifestyle • health education • health promotion • health literacy

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Author's address:

Karol Görner, Faculty of Arts, Matej Bel University, Tajovského 40, 97401 Banská Bystrica, Slovakia; e-mail: karol.gorner@umb.sk

Health – *noun* the fact of being well or being free from any illness [35].

Healthy lifestyle – *noun* activities and diet choices that make a person healthy [35].

Healthcare – *noun* the provision of medical and related services aimed at maintaining good health, especially through the prevention and treatment of disease [35].

Health-related behaviours – voluntary activities undertaken by humans with the purpose of developing or enhancing their health potential.

Health education – process through which humans learn to take care of their health and that of the others.

Sources of knowledge of health – humans, places, objects and technologies used to gain information regarding a healthy lifestyle.

Competitive – *adjective*
1. involving competition
2. tending to want to do something better than others or achieve more than others [35].

Motor – *adjective* relating to muscle activity, especially voluntary muscle activity, and the consequent body movements [35].

Performance – *noun* the level at which a player or athlete is carrying out their activity, either in relation to others or in relation to personal goals or standards [35].

Dan (dan'ı) – a term used to denote one's technical level or grade [36].

Kyū (kyu) – is a Japanese term used in modern martial arts (in judo from 6 to 1 kyu; which is the highest) as well as in tea ceremony, flower arranging.

Coach – *noun* someone who trains sports players or athletes *verb* to train someone in a sport [35].

Combat sport – *noun* a sport in which one person fights another, e.g. wrestling, boxing and the martial arts [35].

INTRODUCTION

Physical activity of moderate intensity practised regularly has positive effects on human health in all aspects: biological, mental and social [1, 2]. It is also the main element of a healthy lifestyle and supports health-related behaviours [3-5]. Judo is an example of a comprehensive activity offering numerous health and educational benefits. In Japan, this discipline was included in the national programme of physical education in 1911 thanks to its numerous advantages [6]. Studies confirm that sports activity, which often involves competition, promotes health and prevents people from adopting unhealthy behaviour as well as helping them to pursue a healthy lifestyle [7]. The studies of competitors of the international class of judo conducted by Jacini et al. [8] have shown some positive changes in the brain structure, e.g. significantly increased density of the grey matter in the areas responsible for planning and motor control of movement. However, a competitive sport is not, by definition, an activity focused on health, but on achieving maximum psychophysical abilities. Health is often seen as a prerequisite for achieving success in sport. It is a tool, a potential, that enables people to win sports competitions. The fact that healthy athletes are capable of making every effort and committing themselves to the maximum extent possible proves that a healthy lifestyle is of the greatest importance to them. However, it seems that sports, especially combat sports, have a special potential to affect education. The societies of the East associate them with a number of desirable values. Apart from obvious health benefits, they contribute to the moral education of people, reduce social brutality and provide positive behaviour patterns. They are also a source of self-satisfaction [9-12].

A healthy lifestyle which consists of a number of health-related behaviours is a key factor in determining the health of the population [13, 14]. For the purposes of this paper, it has been assumed that health-related behaviours include all activities undertaken in order to prevent or diagnose diseases or improve health and physical and mental state [15].

Undoubtedly, there is a problem with the promotion of health-related behaviours among children and young people, for whom an unhealthy and dangerous lifestyle can be very attractive. Young people usually draw their knowledge about health, health-related behaviours and unhealthy

behaviour from many different sources. Hence, the factors determining health-related behaviours can be discussed and evaluated in particular with regard to competitors whose good health forms a prerequisite to achieve good results in their discipline.

The aim of this paper is the relationship between the level of health-related behaviours and the participation in competitive sports and sources of knowledge on health among people practising judo, combined with a search for the factors determining the health-related behaviours.

Hence, the study reported in this paper aims to provide an answer to the following questions: what is the level of the health-related behaviours of the judo competitors?

what are the sources applied by competitors when they gain insights about health, healthy lifestyle and which of these sources correlate with the level of health-related behaviours?

what role is played by the coach in the process of promoting health-related behaviours?

what is the principal factor which determines the health-related behaviours of judo competitors?

MATERIAL AND METHODS

Participants

The study included 101 people practising judo (33 women and 68 men). The judo practitioners included in the study were in the squad of the Silesian macroregion; the majority of them were also in the Polish National Team in Judo. Twenty-four respondents had master grades 1-3 dan and others had student grades 5-1 kyu. The study was conducted during the winter training camp in Żywiec in 2014 when the judokas were preparing for the Polish Championships. The participation in the study was voluntary, and the respondents completed questionnaires anonymously in their free time between training sessions.

Procedures

A standardized research tool, i.e. the Health Behaviour Inventory (HBI), according to the adaptation of Juczyński [16] was used. This is a tool of self-description consisting of 24 statements describing various types of health-related behaviour to which a respondent must assign values

from 1 to 5, taking into account their frequency. After adding the values of all statements, the general index of *intensity of health behaviours* was obtained. This ranged from 24 to 120 points. The higher the value of the index, the greater the intensity of health-related behaviour forms.

Other indexes in the following four categories were also calculated according to the procedure of the test applied: *proper nutrition habits, preventive behaviour, psychological attitudes and health practices*. According to the recommendations of the author of the text, the general index of health-related behaviour forms was converted into sten scores and the results obtained were interpreted in the following way: 1-4 as low, 5-6 as average, 7-10 as high. The internal consistency of the HBI was determined on the basis of Cronbach's alpha 0.92 (the author of the research tool determined the reliability of this tool at 0.85).

For the purposes of the assessment of sources of knowledge about health and healthy lifestyle, the original questionnaire used was one in which respondents were asked to assign a specific point value to specific sources on the Likert scale from 1 to 5. Sources of knowledge given in the questionnaire included: a) coach, b) coaching staff (physiotherapist, psychologist etc.), c) family environment, d) healthcare professionals (physicians,

nurses), e) peers, friends, f) television, g) Internet, h) newspapers.

Statistical analysis

The collected material was analysed using the Statistica 12.5 software. The basic statistics were calculated, which was coupled with the use of and single- and multi-variate linear regression analysis. In order to study the significance of differences between means (M), the U Manna-Whitney test was used, and the relationships between analysed variables were calculated using the tau Kendalla correlation. The effects for which the probability value was lower than the assumed significance level 0.05 ($p < 0.05$) were assumed to be significant in the above-mentioned analysis.

RESULTS

Participant profiles

The mean age of the competitors was 19.9 years for women and 21.1 years for men. The participants of this group have practiced for 9.3 and 11.3 years, respectively, and the average frequency of 5 times per week. The study did not demonstrate statistically relevant differences between the indicators discussed above depending on the gender of the participants.

Combat sports – are a competitive contact sports with one-on-one combat. Determining the winner depends on the particular contest's rules. In many combat sports, a contestant wins by scoring more points than the opponent or by disabling opponent [37].

Martial arts – plural noun any of various systems of combat and self-defence, e.g. judo or karate, developed especially in Japan and Korea and now usually practised as a sport [35].

Martial Arts – are systems of fight practices (practiced in many reasons: self-defence, competition, self-improvement, physical health and fitness, mental and physical development) [37].

A Likert scale – is a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research, such that the term (or more accurately the Likert-type scale) is often used interchangeably with rating scale, even though the two are not synonymous [38].

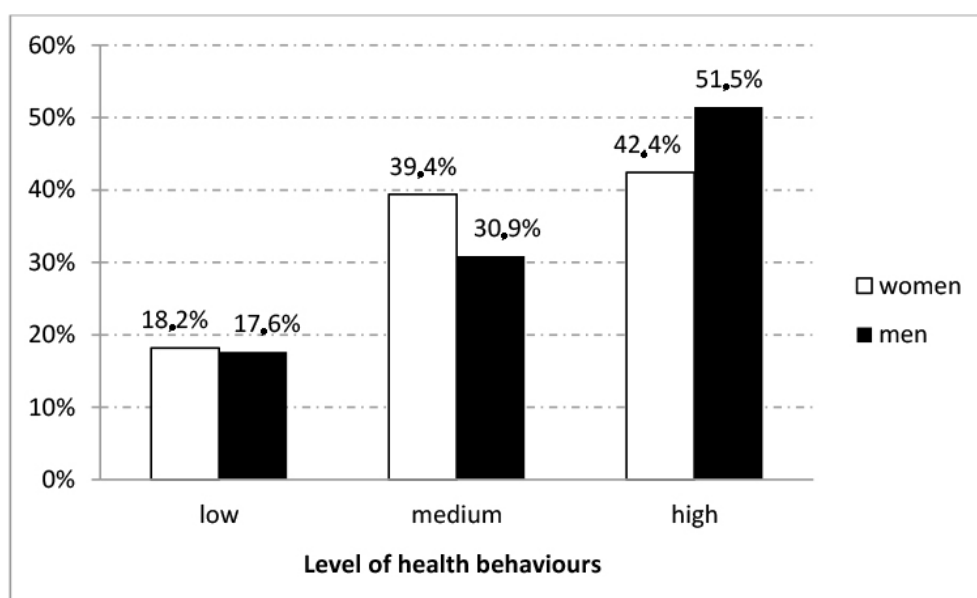


Figure 1. Level of general intensity of health-related behaviours in Polish judo athletes ($n = 101$) covered by the study.

Health-related behaviours

The mean value of the general index of intensity of health-related behaviours of judoka was equal to 87.8 points. The lowest value amounted to 56 points, whereas the highest value amounted to 120 points. It is worth noting that the mean value of the index of health-related behaviours of adult Poles given by the author for the research tool used is 81.82 points. Also, in the case of all four analysed categories of health-related behaviours, i.e. proper nutrition habits, preventive behaviours, psychological attitudes and health practices, the respondents obtained higher values than the population of adult Poles. The results did not show significant statistical differences in terms of these indicators depending on the gender of the competitors.

As a result of the conversion of raw data into units standardized as sten scores, the majority of men (51.5%) and 42.4% of women achieved a high level of health-related behaviours (Figure 1). Almost 40% of women and 31% of men demonstrated a mean level of health-related behaviours, a low level of health-related behaviours applied only to 18% of judokas. The gender

indicator leads to a significant ($p \leq 0.05$) differentiation of the examined group in terms of the categories of the behaviours at a mean and high level.

Sources of knowledge

As a result of the analysis of sources of acquiring knowledge about the healthy lifestyle by athletes, the highest values were obtained for the Internet ($M = 3.5$) and the coach ($M = 3.82$); there is no statistically significant difference between these sources (Figure 2). Healthcare professionals also have considerable standing ($M = 3.49$); according to the respondents, the family environment is the least popular source of knowledge ($M = 2.97$). There are no statistically significant differences ($p < 0.05$) in the scope of sources of knowledge on the grounds of the sex of respondents.

Relationships between health behaviours and the level of progress in sport and sources of information about health

The general index of health-related behaviours is positively correlated with all sources of knowledge (Table 1). The highest correlation coefficient was calculated in case of healthcare

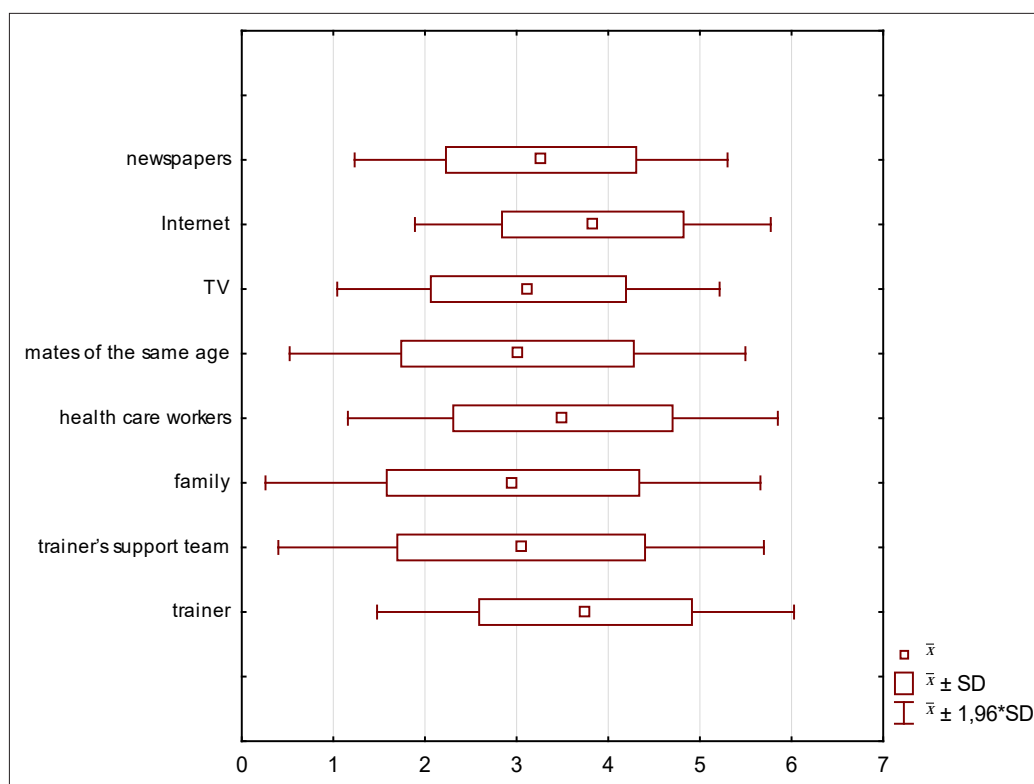


Figure 2. Sources of knowledge of healthy lifestyle (101 Polish judo athletes) based on the Likert scale.

Table 1. Correlations between analysed variables Polish judo athletes (n = 101).

Variables	Variables statistis & empirical	1	2	3	4	5	6	7	8	9	10	11	12	13
	M (mean)	87.86	20.77	10.66	4.65	5.07	3.75	3.04	2.96	3.50	3.00	3.12	3.83	3.26
	SD (standard deviation)	14.10	4.27	5.01	1.44	2.00	1.16	1.35	1.37	1.19	1.26	1.06	0.99	1.03
1	Health Behaviour Inventory (points)		-.13*	-.13*	-.18*	.15*	.24*	.31*	.24*	.35*	.17*	.22*	.16*	.24*
2	Age (years)			.57*	.62*	.27*	-.23*	-.19*	-.20*	-.20*	-.03	-.02	.06	.04
3	Period of training				.60*	.29*	-.12	-.09	-.18*	-.07	-.04	.01	-.01	.03
4	Grade in judo (dan; kyu)					.42*	-.06	-.19*	-.26*	-.26*	-.08	-.08	-.02	-.03
5	Number of trainings per week						.06	.00	-.02	.02	.09	.09	.10	.16*
Sources of knowledge of healthy lifestyle (Likert scale 1 to 5)														
6	trainer**							.45*	.22*	.13	.08	.01	-.02	.10
7	trainer's support team**								.49*	.38*	.26*	.15*	.09	.23*
8	family**									.37*	.41*	.23*	.11	.24*
9	health care workers**										.18*	.21*	.10	.16*
10	mates of the same age**											.47*	.29*	.39*
11	TV**												.41*	.62*
12	Internet**													.44*
13	newspapers**													

*correlations statistically significant for $p < 0.05$; **sources of knowledge of healthy lifestyle

professionals. The Internet is least associated with the improvement of the index of health-related behaviours among all analysed sources of knowledge. The coach (as a source of knowledge) translates into an increase in health-related behaviours to a small extent ($\tau = 0.243$).

A significant correlation was also established between all analysed indicators (the correlation with the age, record of sport activity, technical refinement is negative whereas for the number of training sessions per week it is positive). We can note, however, that the correlation levels were found to be weak.

A single- and multi-variate linear regression analysis was undertaken with the purpose of identifying the best prediction factor of health-related behaviours among all indicators applied in the correlation analysis. The projected model proved to be statistically significant. The coefficient determination provided justification for 40% of the relative variable, i.e. for the overall index of health-related behaviours ($R^2 = 0.409$; $df = 12$; $F = 5.085$; $p = 0.000$). However, among the many prediction factors applied in the study of the health-related behaviours, only two proved to be statistically significant – frequency of training

sessions followed by competitors ($B = 2.202$; $\beta = 0.313$; $t = 3.088$; $p = 0.002$) and the use of medical doctors as a source of knowledge regarding healthy lifestyle ($B = 3.332$; $\beta = 0.282$; $t = 2.851$; $p = 0.005$).

DISCUSSION

Doing sports, especially combat sports, has a lot of health benefits not only in terms of biology, but also psychosocial health [17]. Judo can be regarded as a sports discipline or martial art, depending on training objectives and the coach who will fulfil the goals set [18]. Not only is the coach obliged to take care of the technical, endurance, strength and tactical training of young people, but he/she should also have an influence on their social, emotional and health development. The relationship with the coach is of great importance to athletes [19, 20]. He/she is usually a role model, therefore a person performing the function of the coach should be a teacher, mediator, tutor and creative author of training in one person [21]. Studies conducted by Neofit and Ion Ene [22], Sterkowicz-Przybycień et al. [23] have shown a positive effect of judo on children; positive changes were found in the emotional, social

and moral, volitional and intellectual sphere. However, coaches put sports results first in their work. Studies related to karate coaches have shown that the fulfilment of training objectives is only limited to the physical (endurance), technical and tactical training of young people [24]. Obviously, coaches working with children and youth should play the role of health educators, however, the results of this study does not confirm the importance of their role in promoting health-related behaviours.

From the theoretical point of view, it is assumed that investing in sports is investing in the prevention of a number of unhealthy or illegal behaviours. The specific nature of adolescence, and the numerous educational problems occurring in this period, encourage teachers, tutors and social workers to search for effective methods of working with difficult and depraved teenagers. One of the methods of social rehabilitation is a hand-to-hand combat which is considered to be a means to reduce aggression [25]. However, Davis and Menard [26] showed that taking part in sport has no or little direct impact on illegal behaviours, except for contact sports. The health dimension of combat sports and martial arts is determined by the fact that they are not only a defence method, but also a method of strengthening the body, biological regeneration, preventive and therapeutic activities. Thanks to them, the general physical fitness of the body, as well as the positive health potential, can be increased [27].

The author's own studies confirm the benefits of judo. Judo practitioners present a higher level of health-related behaviours than average Poles. The mean value of the indicator of health-related behaviours reported by the author of the study tool was 81.8 points, whereas for the author's own studies the score was 87.8 points. However, it is alarming that the level of health-related behaviours decreases as the sports level or training experience increases. It can be stated that a long-term training experience or contact with sports environment lowers the index of health-related behaviours. It may be caused by the fact that athletes are tired due to their constant training regime, which imposes on them a specific discipline in everyday life. A long-term sports lifestyle can be onerous to them, and can result in the desire to abreact in an unhealthy way. Some studies demonstrate the high level of unhealthy behaviours followed by students of Physical Education and Sports courses, despite

the fact that such persons should be potentially well prepared to take on the role of health educators and communicators of healthy lifestyle [28]. Cohen et al. [29] enumerate 4 factors that have an influence on health-related behaviours: a) access and the degree of protection against harmful consumer products, b) physical environment, c) social environment and politics, d) media and culture of communication. The first three factors have a direct influence on people, because they facilitate or hinder health-related behaviours, whereas the fourth factor, i.e. mass media, acts by changing individual attitudes, cognitive beliefs and group norms.

Physical activity should be a part of the state health policy; it is both economically and socially viable [30]. Coaches who are well prepared to work are one of the key elements of the sports system. Lumpkin [31] emphasizes the significant role of coaches as leaders who must be responsible and who should act ethically, because they shape athletes. On the basis of their study, Błach et al. [32] conclude that martial arts masters have a great influence on health-related behaviours of young people and they constitute a role model not only in the sports hall, but also in private life.

From the authors' own studies, it is clear that coaches are not leaders in the role of promoting health-related behaviours, whereas health-care professionals (principally medical doctors) can play a major role in this respect.

It is well known that if you want to get through to young people with a specific message, you have to enter their world and communicate there. The Internet, in particular social media, is the current world of young people. It is the information flow channel that offer a huge potential in health promotion [33, 34]. It can be seen on the basis of the author's own study that the Internet is a key source of knowledge for persons practising sports, but it is not reflected in the improvement of health-related behaviours; the correlation analysis shows that it has a low influence on health-related behaviours. It is the evidence of low credibility of contents found in the Internet. It can therefore be concluded that the use of different sources of information by the coach, who should be an authority in this field, would be an effective strategy.

CONCLUSIONS

Despite the high level of health-related behaviours of the judoka (51.5% of men, 42.4% of women), their level decreases with age, progress in sport and training experience. The number of training sessions forms a factor which determines an increase of the level of health-related behaviours.

The person of the coach as well as the Internet form the most common sources of knowledge regarding health, health-related behaviours, however, healthcare professionals determine the statistically significant behaviours of judo practitioners.

Throughout the process of advanced level training, it is valuable to invest in a team dedicated

to prepare and support competitors in particular in terms of the medical aspects of the training. Healthcare professionals form an important component of the coaching team due to the fact that they are effective educators in terms of health-related behaviours.

LIMITATIONS OF THE STUDY

The study into the present sources of knowledge forms an obstacle as a result of the existence of a great number of factors which can potentially play a role on the awareness of the investigated competitors. The tool that was applied contains a proposition of several important (and common) sources of insight regarding health-related behaviour forms.

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