

THE RELATIONSHIPS BETWEEN THE PERFORMANCE LEVEL AND TYPE OF SPORT AND THE QUALITY OF LIFE AND HEALTH SATISFACTION OF THE DISABLED WHO PRACTICE SPORT

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Abstract

The aim of the study was to determine the relationship between the quality of life and health satisfaction with the level of sport performance in individuals practicing wheelchair basketball, wheelchair rugby, rowing and individual sports. The research included 192 athletes with disabilities, aged 19 to 49, from all over Poland. Males accounted for almost 80% of the subjects. The group of respondents included people who practice either competitive (classified) (n=66) (World Champions, Polish Champions) or amateur (unclassified) (n=126) sports. The standardized questionnaire of the World Health Organization Quality of Life (WHOQOL-BREF) and a self-designed questionnaire were used. Nonparametric statistics were applied in the analyses of the results. The value of $p \leq 0.05$ was assumed to be statistically significant. It was found that amateurs felt greater health satisfaction and assessed their quality of life higher than the Polish Champions ($p \leq 0.05$). However, in the environmental domain, it was the Polish Champions who achieved better results ($p \leq 0.05$). In the social, physical and psychological domains, higher scores were achieved by amateur athletes as compared to the Polish and World Champions ($p \leq 0.05$). Wheelchair basketball athletes were more satisfied with their health and quality of life, as well as other domains (apart from environmental), as compared to wheelchair rugby and rowing athletes ($p \leq 0.05$). People aged 25-34, with education above the secondary level, employed, felt best about their quality of life. Improving the quality of life should be an important goal in the rehabilitation and training process of people with disabilities practicing sports.

Keywords: WHOQOL-BREF, wheelchair basketball, wheelchair rugby, rowing, individual sports, sport performance level

Introduction

In 2019, the disabled, in legal or biological terms (with serious limitations), constituted 13% of Poland's population (**Health status of population in Poland in 2019, 2019**). The problem of disability poses an obligation on the society to develop modern solutions in the field of rehabilitation, means of transportation, adaptation of facilities, employment and education of individuals with disabilities (Kubicki, 2019; Aitchison et al., 2020). In the process of improving mobility of the disabled, physical activation is important (Botwina & Kowalik, 2013; Arsham & Sarabandi, 2017; [Lape et al., 2017](#); [Telebuh et al., 2017](#); [Jooste & Kubayi, 2018](#); [Wendt et al., 2021](#)).

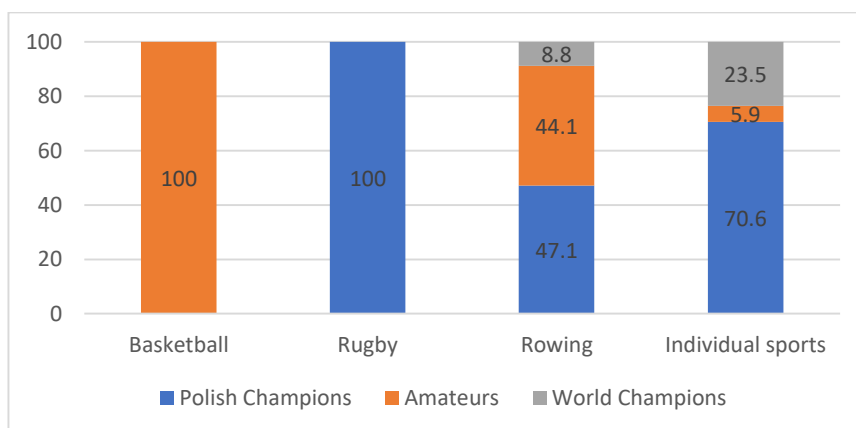
In the case of people expressing the need for competition, the goal of sports activity is to strive for the best results (Niedbalski, 2016) and satisfying the

need for self-fulfillment. Comparisons of disabled and non-disabled athletes in their pursuit of success, achieving their goals and dreams, as well as commitment to training, show more similarities than differences (Diffenbach & Statler, 2012). In the analysis of the motivational function of sports activity goals of able-bodied karate fighters, boxers, football players in comparison with wheelchair basketball players, no differences in persistence were observed (Kotarska et al., 2020).

The World Health Organization (WHO) defines quality of life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns (**WHO. Division of Mental Health and Prevention of Substance Abuse, 1997**). The assessment of satisfaction with life as a whole, as well as with its particular areas, is a measure of the success of

Sex:									
-man	80.9	100.0	76.5	41.2	153	79.7	-	-	
-woman	19.1	0.0	23.5	58.8	39	20.3			
Age:									
≤24 years	9,1	0,0	26,5	29,4	24	12,5			
25-34	42.7	38.7	23.5	23.5	71	37.0			
35-44	32.7	61.3	17.7	23.5	65	33.8	-	-	
≥45	14.5	0.0	32.3	23.5	32	16.7			
Place of residence:									
-city	99.1	48.4	73.5	94.1	165	85.9	0.0000	0.5	
-village	0.9	51.6	26.5	5.9	27	14.1			
Relationship status:									
- I am not in a relationship	21,1	48,4	50,0	52,9	62	33,2	0.0126	0.2	
- I have a partner	4.6	3.2	10.0	5.9	10	5.3			
- married	63.3	48.4	36.7	35.3	98	52.4			
- divorced	11.0	9.7	3.3	5.9	17	9.1			
Education:									
- below secondary	14.6	12.9	23.5	11.8	30	15.6			
- secondary	23.6	58.1	50.0	58.8	71	37.0	0.0002	0.3	
- above secondary	61.8	29.0	26.5	29.4	91	47.4			
Job type:									
-pupil/student	7.3	9.7	17.7	23.5	21	10.9			
-physical labour	12.7	3.2	8.8	11.8	19	9.9			
-mental work	65.5	58.1	32.4	35.2	107	55.8	0.0177	0.2	
-studying and working	4.5	6.5	5.9	5.9	11	5.7			
-disability pension	10.0	22.5	35.2	23.5	34	17.7			
Financial situation:									
-very good	39.1	3.2	23.5		55	28.7			
-good	52.7	61.3	38.2	17.7	102	53.1	0.0000	0.3	
-sufficient	8.2	35.5	38.3	70.6	35	18.2			
				11.7					

Among people practicing rowing and individual sports (shooting, wheelchair table tennis, swimming, karate, strength sports) were Polish Champions, World Champions and amateurs. The wheelchair basketball players represented the amateur level, whereas the rugby players were Polish Champions (**Fig. 1**).



*Individual sports - shooting, wheelchair table tennis, swimming, karate, strength sports

A general differentiation was found between satisfaction with life and health, as well as between particular domains, and the sport performance level of the respondents ($p \leq 0.05$) (H test) (**Table 2**). Amateurs assigned higher ratings to their quality of life ($p = 0.0063$ for the U test), also in the social domain ($p = 0.0000$ for the U test; $rg = 0.3$), as well as satisfaction with health, as compared to the Polish Champions ($p = 0.0331$ for the U test). In comparison with the Polish Champions and the World Champions,

amateurs also rated their quality of life higher in the physical ($p = 0.0000$; $p = 0.0018$ for the U test) and psychological ($p = 0.0000$; $p = 0.0040$ for the U test, respectively) domains. In these cases, the effect size was very high ($rg =$ from 0.6 to 0.8). Only in the environmental domain did the Polish Champions achieve better results, as compared to the amateurs and World Champions ($p = 0.0000$; $p = 0.0291$ for the U test; $rg = -0.6$; 0.5, respectively).

Table 2. Satisfaction with life, health and particular domains of the quality of life (WHOQOL-BREF) of wheelchair basketball players, wheelchair rugby players, rowers and individual sports athletes depending on their sport performance level (H test, E^2_R , U test, rg).

Specification	Sport performance level	Polish Champions Value of p for U statistics	World Champions	Polish Champions Glass rank correlation (rg)	World Champions biserial	Rank means
Satisfaction with life $H(2,191)=7.59$ $E^2R=0.40$ $p=0.0225^*$	Amateurs	0.0063*	0.4734	0.2	0.1	103.09
	Polish Champions		0.7121		-0.1	81.77
	World Champions					89.14
Satisfaction with health $H(2,191)=6.82$ $E^2R=0.04$ $p=0.0330^*$	Amateurs	0.0331*	0.0721*	0.2	0.3	102.38
	Polish Champions		0.3957		0.2	85.75
	World Champions					68.28
Physical domain $H(2,192)=73.90$ $E^2R=0.38$ $p=0.0000^*$	Amateurs	0.0000*	0.0018*	0.8	0.7	121.30
	Polish Champions		0.1723		-0.3	47.61
	World Champions					61.92
Psychological domain $H(2,192)=46.90$ $E^2R=0.24$ $p=0.0000^*$	Amateurs	0.0000*	0.0040*	0.6	0.6	116.30
	Polish Champions		0.7682		0.1	59.27
	World Champions					53.78
Social domain $H(2,192)=15.53$ $E^2R=0.08$ $p=0.0004^*$	Amateurs	0.0000*	0.5799	0.3	0.1	107.17
	Polish Champions		0.2234		-0.3	73.61
	World Champions					97.21
Environmental domain $H(2,192)=41.90$	Amateurs	0.0000*	0.4648	-0.6	-0.2	78.68
	Polish Champions		0.0291*		0.5	135.08

E ² R=0.21 p=0.0000*	World Champions	92.00
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*statistically significant for p≤0.05.

There was confirmed a general differentiation (p≤0.001) in the quality of life and particular domains, as well as health satisfaction of the respondents (H test) (**Table 3**). Basketball players rated their quality of life higher as compared to rugby players and rowers (p=0.0007; p=0.0008 for the U test, respectively). Similar differences were found with regard to health satisfaction (p=0.0066; p=0.0000 for the U test), with the average and high effect size (rg=0.3; rg=0.5, respectively). The greatest effect size was recorded in the physical and psychological domains (rg=0.9; rg=0.8, respectively). Higher scores in the physical domain were noted in the case of wheelchair basketball players as compared to rugby players, rowers and people practicing individual sports (p=0.0000; p=0.0000; p=0.0000 for the U test, respectively), as well as in the psychological domain (p=0.0000; p=0.0000; p=0.0000 for the U test, respectively). Moreover, in the physical domain, differences

were observed between rugby players and rowers (p=0.0453; rg=0.3), as well as rowers and individual sports practitioners (p=0.0302; rg=-0.4). Similar differences were found in the psychological domain between rugby players and rowers (p=0.0184; rg=0.3), as well as rowers and individuals practicing other sports (p=0.0247; rg=-0.4). In the social domain, the differences between basketball players as compared to rugby players and rowers (p=0.0003; p=0.0000) showed an average and high effect size (rg=0.4; rg=0.5). The environmental domain indicated large differences between wheelchair and rugby basketball players (p=0.0000; rg=-0.8) as compared to people practicing individual sports (p=0.0005; rg=-0.5). In this domain, very large differences were also observed between rugby players and rowers (p=0.0000, rg=0.6), as well as between rowers and individuals practicing other sports (p=0.0106; rg=-0.4).

Table 3. Satisfaction with life, health and particular domains of the quality of life (WHOQOL-BREF) of the respondents depending on sport (H test, E²_R, U test, rg).

Specification	Sport	Wheelchair rugby	Rowing	Individual sports ^a	Wheelchair rugby	Rowing	Individual sports ^a	Rank means
		Value of p for U statistics			Glass rank biserial correlation (rg)			
Satisfaction with life H(3,191)=18.11 E ² R=0.09 p=0.0004*	Wheelchair basketball	0.0007*	0.0008*	0.3353	0.4	0.3	0.1	108.38
	Wheelchair rugby		0.7625	0.2221		0.1	-0.2	75.98
	Rowing			0.2049			-0.2	74.92
	Individual sports							95.20
Satisfaction with health H(3,191)=24.10 E ² R=0.13 p=0.0000*	Wheelchair basketball	0.0066*	0.0000*	0.0857	0.3	0.5	0.2	110.03
	Wheelchair rugby		0.0515	0.9421		0.2	-0.1	85.12
	Rowing			0.1636			-0.2	65.01
	Individual sports							87.82
Physical domain H(3,192)=128.6	Wheelchair basketball	0.0000*	0.0000*	0.0000*	0.9	0.9	0.9	135.38

Satisfaction with health H(3,191)=8.77 E ² R = 0.05 p=0.0325*	≤24	0.0040*	0.0824	0.1473	-0.3	-0.2	-0.2	73.70
	25-34		0.1227	0.1754		0.1	0.1	107.02
	35-44			0.9273			0.1	94.12
	≥45							93.05
Physical domain H(3,192)=14.56 E ² R = 0.08 p=0.0022*	≤24	0.0011*	0.0489*	0.0795	-0.4	-0.3	-0.3	68.02
	25-34		0.0107*	0.0533		0.3	0.2	114.08
	35-44			0.9233			-0.1	90.76
	≥45							91.95
Psychological domain H(3,192)=12.97 E ² R = 0.07 p=0.0047*	≤24	0.0057*	0.4080	0.1195	-0.4	-0.1	-0.2	75.88
	25-34		0.0032*	0.1541		0.2936	0.2	113.53
	35-44			0.1736			-0.2	84.92
	≥45							98.89
Social domain H(3,192)=15.93 E ² R = 0.08 p=0.0012*	≤24	0.0004*	0.1036	0.0444*	-0.5	-0.2	-0.3	68.40
	25-34		0.0057*	0.0682		0.3	0.2	114.42
	35-44			0.4697			-0.1	88.46
	≥45							95.58

*statistically significant for p≤0.05.

Athletes with education higher than secondary assessed their quality of life higher than those with secondary or lower education (p=0.0000 for the U test; rg=-0.4; p=0.0000 for the U test; rg=-0.6, respectively). The best-educated athletes were more satisfied with their health than those with secondary

education (p=0.0000 for the U test). Higher assessments of the quality of life in the physical, psychological and social domains were given by athletes with education above secondary, as compared to the rest. These differences are confirmed by the high effect size (rg=-0.5; -0.6) (**Table 5**).

Table 5. Satisfaction with life, health and particular domains of the quality of life (WHOQOL-BREF) of the respondents depending on the level of education (H test, E²R, U test, rg).

Specification	Education level	Secondary	Above secondary	Secondary	Above secondary	Rank means
		Value of p for U statistics		Glass rank biserial correlation (rg)		
Satisfaction with life H(2,191)=39.96 E ² R=0.2 p=0.0000*	Below secondary	0.0902	0.0000*	-0.2	-0.6	63.69
	Secondary		0.0000*		-0.4	79.64
	Above secondary					119.06
Satisfaction with health H(2,191)=6.82 E ² R=0.1 p=0.0330*	Below secondary	0.8326	0.0992	0.1	-0.2	88.60
	Secondary		0.0142*		-0.2	86.50
	Above secondary					105.77
Physical domain H(2,192)=38.225	Below secondary	0.4057	0.0002*	0.1	-0.5	79.52
	Secondary		0.0000*		-0.5	70.54

E2R=0.2 p=0.0000*	Above secondary					122.36
Psychological domain H(2, 192)=51.12 E2R=0.3 p=0.0000*	Below secondary	0.2201	0.0000*	-0.2	-0.6	63.53
	Secondary		0.0000*		-0.6	72.01
Social domain H(2, 192)=36.11 E2R=0.2 p=0.0000*	Above secondary					126.47
	Below secondary	0.8735	0.0000*	-0.2	-0.5	73.02
	Secondary		0.0000*		-0.5	74.81
	Above secondary					121.16

*statistically significant for $p \leq 0.05$.

Working athletes assessed their quality of life higher than those relying solely on disability pension ($p=0.0068$ for the U test; $rg=0.3$). The employed had higher satisfaction with health in comparison to students and pensioners ($p=0.0079$ for the U test, $rg=-0.3$; $p=0.0003$ for the U test, $rg=0.4$, respectively). Differences in the physical domain were confirmed between employed respondents and athletes who were students ($p=0.0059$ for the U test; $rg=-0.4$), as well as

pensioners ($p=0.0001$ for the U test; $rg=0.4$). The employed respondents assessed their quality of life higher in the psychological domain in comparison with pensioners ($p=0.0080$ for the U test; $rg=0.3$). Working athletes also had higher scores as compared to students ($p=0.0225$ for the U test; $rg=-0.3$), people simultaneously studying and working ($p=0.0324$ for the U test; $rg=0.4$) and the pensioners ($p=0.0412$ for U-test; $rg=0.2$) in the social domain. (**Table 6**).

Table 6. Satisfaction with life, health and particular domains of the quality of life (WHOQOL-BREF) of respondents depending on professional activity (H test, E^2_R , U test, rg).

Specification	Activity type	Work	Studying and working	Disability pension	Studying and working	Pension	Rank means	
		Value of p for U statistics			Glass rank biserial correlation (rg)			
Satisfaction with life H(3,191)=8.21 $E^2_R=0.04$ p=0.0418*	Studying	0.2676	0.3955	0.2622	-0.1	-0.2	0.2	89.31
	Work		0.8663	0.0068*	0.0		0.3	101.91
	Studying and work			0.1170			0.3	104.36
	Disability pension							75.71
Satisfaction with health H(3,191)=16.81 $E^2_R=0.09$ p=0.0008*	Studying	0.0079*	0.2263	0.8673	-0.3	-0.2	0.0	74.93
	Work		0.7333	0.0003*	0.1		0.4	105.62
	Studying and work			0.1312			0.3	99.77
	Disability pension							71.41
Physical domain H(3,192)=19.48	Studying	0.0059*	0.4614	0.8483	-0.4	-0.2	0.0	72.52
	Work		0.1741	0.0001*	0.2		0.4	109.00

$E^2_R=0.10$	Studying and work			0.3336			0.2	86.00
$p=0.0002^*$	Disability pension							68.40
Psychological domain	Studying	0.1065	0.8892	0.6083	-0.2	0.0	0.1	83.88
$H(3, 192)=8.88$	Work		0.2727	0.0080*		0.2	0.3	104.94
$E^2_R=0.05$	Studying and work			0.6053			0.1	86.09
$p=0.0309$	Disability pension							76.38
Social domain	Studying	0.0225*	0.8061	0.6469	-0.3	0.1	-0.1	76.60
$H(3,192)=10.85$	Work		0.0324*	0.0412*		0.4	0.2	105.50
$E^2_R=0.06$	Studying and work			0.4859			-0.1	69.77
$p=0.0125^*$	Disability pension							84.07

Discussion

As a result of the research, differences in the perception of the quality of life by athletes of different sport performance levels were confirmed. Practitioners of amateur sports had higher scores for overall quality of life in individual domains and health satisfaction. Only in the environmental domain did the Polish Champions achieve better results, as compared to the amateurs and the World Champions. These results may reflect less environmental support for individuals practicing unclassified/amateur sports. Polish Champions (both able-bodied and disabled) receive scholarships (yearly) from the Ministry of Sport. Some of the medalists of the Polish Championships are the recipients of the scholarship program awarded by local governments. The presented situation may have an impact on the assessment of the quality of life in the environmental domain.

Different results have been obtained from studies of wheelchair tennis athletes, who see themselves as having better quality of life than non-national competitive athletes (Ciampolini et al., 2017). Whereas, physical activity improved the quality of life (Chatzilecas et al., 2017; Ganesh & Mishra, 2016; Yazicioglu et al., 2012).

In the authors' own research, it was found that wheelchair basketball players were more satisfied with health, quality of life, and also particular domains (with the exception of the environmental domain) as compared to

wheelchair rugby players and rowers. Compared to representatives of individual sports, rowers found their quality of life lower in regards to the physical, psychological and environmental domains. The reasons for the low assessment of the rowers' quality of life can be seen in the limited number of competitions in which players can participate (single, double, quadruple), and thus achieve significant results on the international arena and win scholarships. Research (Bolach & Prystupa, 2014) shows that disabled athletes achieve a medium-level quality of life, regardless of their affiliation to individual or team sports. Other studies show that teamwork in sport and the emotions associated with sport are the main factors motivating the disabled to engage in team sports (wheelchair basketball, wheelchair rugby) (Molik et al., 2010). Comparative studies of basketball and wheelchair rugby athletes with non-athletes indicate similar level of quality of life, symptoms of depression, anxiety and mood between these groups (Vancini et al., 2019). Weaker assessments of the quality of life by rowers require further research.

It was found in this research that athletes aged 25-34, with education above secondary and professionally active, felt greater satisfaction with their health and overall quality of life. Pokaczajło et al., (2016) observed that people with a higher level of knowledge about their own health were characterized by a higher level of quality of

life. **Ganesh & Mishra (2016)** prove that physical activity and professional activity were significant predictors of all domains of quality of life. At the same time, research shows that practicing sports by people with disabilities requires the help and dedication of the family (**Kamionka & Lipowski, 2021**). Encouraging the disabled to participate in social life within mainstream schools and open labor market (**Shephard, 1991; Lastuka & Cottingham, 2015; Kubicki et al., 2019**) as well as physical activation may bring significant results in improving their quality of life and health.

Conclusions

1. Amateurs displayed greater satisfaction with health, assessed their quality of life higher, also in the social, physical and psychological domains, as compared to the Polish Champions. World Champions rated their quality of life lower than amateurs in the

physical and psychological domains. Only in the environmental domain did the Polish Champions achieve better results, as compared to the amateurs and the World Champions.

2. Wheelchair basketball players were more satisfied with health, quality of life, and the physical, psychological and social domains, as compared to wheelchair rugby players and rowers. The quality of life defined by the environmental domain was rated higher by rugby players and practitioners of various individual sports, as compared to basketball players and rowers.

3. People aged 25-34, with higher secondary education and working, assessed the quality of life and satisfaction with health higher.

Final conclusion: Improving the quality of life should be an important goal in the rehabilitation and training process of people with disabilities practicing sports.

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