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Original Investigation

Determinants of Life Satisfaction Among Marathon Runners

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Purpose: This study aimed to assess life satisfaction and health behaviors among marathon runners and explore the determinants of higher satisfaction levels. The hypothesis was that marathon participation leads to pro-health behaviors and increased life satisfaction.
Methods: A cross-sectional survey was conducted with 506 Polish marathon runners. Participants were recruited through a social network for runners. Health behaviors were measured using the Health Behavior Inventory (HBI), while life satisfaction was assessed using the Satisfaction with Life Scale (SWLS). Statistical analyses included regression models to identify predictors of life satisfaction.
Results: The analysis revealed that marathon runners exhibited a high level of life satisfaction, with 45% of women and 37% of men reporting high satisfaction. Significant differences were found in training distances and marathon participation between genders. The regression model identified three key predictors of life satisfaction: training experience, number of marathons completed, and the overall health behavior index (HBI). Additionally, when health behavior categories were further analyzed, the Positive Mental Attitude (PMA) category showed the strongest association with life satisfaction. The final model explained 18% of the variability in life satisfaction, with the number of completed marathons and PMA being significant predictors.
Conclusions: Marathon participation fosters pro-health behaviors, particularly a positive mental attitude, which contributes to higher life satisfaction. This highlights the importance of mental well-being alongside physical activity in long-distance running. Promoting running as an accessible form of exercise, with a focus on health education and psychological support, could significantly improve participants' quality of life.

Keywords: Life Satisfaction, Marathon Runners, Health Behaviors, Positive Mental Attitude, Training Experience

Introduction

Enhancing quality of life remains a cornerstone of public policy in highly developed nations. While recent improvements have been observed in the Human Development Index,[1] these gains have yet to fully recover to pre-pandemic levels. The decline in life satisfaction observed in recent years can be largely attributed to the COVID-19 pandemic, which imposed restrictions on many aspects of social life, including recreational activities such as amateur sports.[2,3]
Life satisfaction is defined as the overall evaluation of one's achievements and living conditions.[4] A higher level of satisfaction is achieved when the gap between one's perceived accomplishments and their evaluative standards narrows.[5] According to research, life satisfaction represents the cognitive component of subjective well-being.[6]
Stimulating the search for effective strategies to improve well-being seems to be a necessity at present. Physical activity in free time, including amateur sports, can fulfill many functions that are important from the perspective of public health. Sports and recreational events are an important element of prevention and health promotion. Among the most popular are street races organized all over the world. Their specificity is that they are, by definition, available to everyone, regardless of gender, age, or level of sports advancement. Data from World Athletics reveals that over 10,000 such competitions occur annually, engaging more than a million participants globally – approximately 46 events and over 70,000 athletes each week.[7]
Generally, street running is developing based on the legendary marathon distance, which is 42.195 km. For many amateur runners, completing a marathon is both a personal challenge and a primary objective, with marathon participation continuing to grow in popularity worldwide.[8,9] Marathon training represents a demanding yet rewarding pursuit, requiring significant preparation and commitment. While such efforts are often motivated by performance goals, they frequently encourage the adoption of health-enhancing habits and behaviors.[10] Health behaviors encompass any action aimed at preventing illness, promoting health, or enhancing overall well-being[11]. These behaviors may vary in awareness, frequency, intensity, or duration. A healthy lifestyle builds a high level of health awareness, self-esteem and social support.[12]
This study aimed to assess life satisfaction and health behaviors among marathon runners and explore the determinants of higher satisfaction levels. We hypothesize that amateur runners display elevated pro-health behaviors due to the demands of their

sport. Additionally, participation in competitive sports and the fulfillment of personal goals likely contribute to increased life satisfaction. However, the question remains: which specific behaviors play a dominant role in shaping these outcomes?

Methods

Participant and Project Characteristics

This cross-sectional study included 506 Polish runners 426 men (84 %) and 80 women (16%) aged 18–65 years, all of whom had participated in marathon races. The average age of women was: 34.95±9.89 and men 38.97±11.46 years. Participants were recruited through the largest social networking platform for runners in Poland.

The average training experience of participants was 7 years, with a weekly engagement of 4 training sessions. Male runners covered a weekly average of 56 km, while female runners covered 47 km. Male runners completed an average of 9 marathons, compared to 5 marathons for female runners.

The study included participants who met specific inclusion criteria to ensure the sample's relevance to the research goals. To qualify, individuals must have engaged in long-distance running training for at least one year. Additionally, participation in running events, with the successful completion of at least one marathon, was a mandatory requirement for inclusion.

Conversely, the study excluded individuals who lacked prior marathon experience or who had trained in long-distance running for less than one year. This exclusion criterion aimed to maintain consistency within the participant group and to focus the analysis on experienced long-distance runners.

Experimental Desing

The survey, designed using SurveyMonkey, was shared exclusively with individuals meeting specific criteria: runners who had been training in long-distance running for at least one year, had participated in running events and had completed at least one marathon. All participants were informed about the purpose and structure of the anonymous survey and consented to participate.

Sociodemographic Variables

Demographic data, including age and gender (male or female), were self-reported by participants. Additionally, respondents provided information about their level of engagement in running, encompassing their years of sports internship, the number of training sessions per week, weekly kilometers run, average annual participation in running events, and the total number of marathons completed.

Health Behaviors

To assess health behaviors, the study employed the standardized Health Behavior Inventory (HBI), developed by Juczyński.[13] This tool comprises 24 statements describing various health-related behaviors, which participants evaluated on a scale from 1 to 5 based on frequency. Using the prescribed procedure, four categories of behaviors were analyzed: Proper Dietary Habits (PDH), Preventive Behaviors (PB), Positive Mental Attitude (PMA), and Health Practices (HP).

The overall health behavior index (HBI) was calculated, with higher scores indicating greater intensity of pro-health behaviors. Results were interpreted using a Sten scale: scores of 1–4 represented low levels, 5–6 represented average levels, and 7–10 represented high levels. The reliability of the HBI tool, measured by Cronbach's alpha, was .86.

Life Satisfaction

The Satisfaction with Life Scale (SWLS), developed by Diener et al.[4] and adapted for Polish populations by Juczyński,[13] was used to assess life satisfaction. The scale includes five items measuring overall satisfaction with one's achievements and living conditions, scored on a 7-point Likert scale. Higher total scores reflect greater life satisfaction.

The SWLS scores were interpreted using a Sten scale: scores of 1–4 indicated low life satisfaction, 5–6 reflected average satisfaction, and 7–10 denoted high satisfaction. The reliability of this tool, based on Cronbach's alpha, was .85.

Statistical Analyses

Statistical analyses were conducted using Statistica 13.3 (Tibco Software Inc., 2017, Santa Clara, CA, USA). Descriptive statistics were computed, and linear univariate regression analyses were performed. Unstandardized (B) and standardized (β) regression coefficients were calculated. Additionally, t-tests were employed to determine significant differences between means. A significance threshold of .05 ($P \leq .05$) was applied to identify statistically significant results.

Results

The respondents had an average sports internship of 7.5 years, with 4 training sessions per week. There were no significant differences in these indicators based on the gender of the respondents. As part of their training, men run an average of 55.9 km per week, while women run statistically significantly less – 47.3 km ($P \leq .01$). They also have less marathon running experience, having completed an average of 5.4 marathons, compared to men, who have completed an average of 8.9 marathons over a distance of 42.195 km. Women, on average, participate in running events of various distances more often (16.2 times/year) than men (15.5 times/year), with statistically significant differences ($P \leq .05$).

A high level of life satisfaction is reported by 45% of women and 37% of men, while a low level of life satisfaction is reported by 17.5% of female runners and 20.4% of male runners. The average life satisfaction index does not show significant differences based on the gender of the respondents, and the value amounts to 22.4 points, which is slightly higher than the average value (21.1) for the normalization group provided by the author of the adaptation of the research tool.

The largest proportion of men, 43.1%, are characterized by an average level of the general health behavior index. A low level is observed in 28.6% of respondents, while 28.1% report a high level. In the group of women, the largest percentage, 41.2%, report a low level of the health behavior index, 38.7% report an average level, and 20% of female respondents report a high level of health behavior. The average value of the general index does not show statistically significant differences based on gender. In the case of individual categories of health behaviors, only preventive behaviors (PB) significantly differentiate the respondents, with women scoring slightly higher (Table 1) in this index ($P \leq .01$).

The proposed regression model, which includes variables explaining life satisfaction such as age, gender, HBI index, training experience, and involvement in the sport (expressed as the average number of training sessions per week, kilometers run per week, number of marathon completions, and number of competitions participated in over the past year), was statistically significant (Figure 1). The model explained 10% of the variability in the SWLS index ($R^2 = .102$; $df = 8$; $F = 7.081$; $P = .000$) statistical significance at the level $P \leq .001$. Of the eight SWLS predictors, three were found to be statistically significant: training experience ($B = .071$; $\beta = .099$; $t = -2.010$; $P = .044$) statistical significance at the level $P \leq .05$, number of completed

Table 1. Characteristics of variables in the group of marathon runners.

Variable	Respondents	$\bar{x}$	*SD*	*Me*	*Q*	*t*	*P-value*
Age (years)	Male	38.97	11.46	38.00	8.00	-2.941	.003**
	Female	34.95	9.89	34.00	5.75		
Sports internship (years)	Male	7.40	7.57	4.00	3.00	.213	.830
	Female	7.60	9.30	4.00	3.50		
Weekly training (h)	Male	4.07	1.36	4.00	1.00	-.402	.687
	Female	4.00	1.77	4.00	1.00		
Weekly training (km)	Male	55.96	25.76	50.00	15.00	-2.786	.005**
	Female	47.36	22.84	45.00	15.00		
Number of running events (n)	Male	13.58	9.87	10.00	6.00	1.965	.049*
	Female	16.21	15.64	10.00	7.25		
Number of marathons	Male	8.97	15.32	4.00	3.50	-2.001	.045*
	Female	5.40	10.25	2.50	2.50		
SWLS (a.u.)	Male	22.07	5.60	22.00	3.50	.991	.321
	Female	22.75	5.74	23.00	3.75		
HBI (a.u.)	Male	79.10	13.70	79.00	8.50	1.363	.173
	Female	81.37	13.29	82.50	8.00		
HD (a.u.)	Male	3.31	.78	3.33	.58	1.103	.270
	Female	3.42	.84	3.50	.50		
PB (a.u.)	Male	3.01	.76	3.00	.50	3.337	.001**
	Female	3.32	.75	3.33	.54		
PMA (a.u.)	Male	3.42	.68	3.50	.41	.645	.518
	Female	3.48	.69	3.50	.50		
HP (a.u.)	Male	3.41	.62	3.50	.41	-1.158	.247
	Female	3.32	.69	3.41	.45		

Variable	Respondents		*N*	%
	Male		426	84.19
	Female		80	15.81
SWLS (a.u.)	low	Male	87	20.42
		Female	14	17.50
	average	Male	181	42.49
		Female	30	37.50
	high	Male	158	37.09
		Female	36	45.00
HBI (a.u.)	low	Male	122	28.64
		Female	33	41.25
	average	Male	184	43.19
		Female	31	38.75
	high	Male	120	28.17
		Female	16	20.00

Note: $\bar{x}$, Arithmetic Average; *SD*, Standard Deviation; *Me*, Median; *Q*, Quarter Deviation; Student's *T*-test value; *P*, Probability level (Significant difference „*" $P \leq .05$, „**" $P \leq .01$) compared to Precondition); SWLS, Satisfaction with Life Scale; HBI, Indicator of the level of general Health Behavior; HD, Healthy Diet; PB, Preventive Behavior; PMA, Positive Mental Attitudes; HP, Healthy Practices.

marathons (*B*= .049; *β*= .128; *t*= 2.468; *P*= .013) statistical significance at the level *P*≤ .05, and HBI (*B*= .115; *β*= .280; *t*= 6.377; *P*= .000) statistical significance at the level *P*≤ .001.

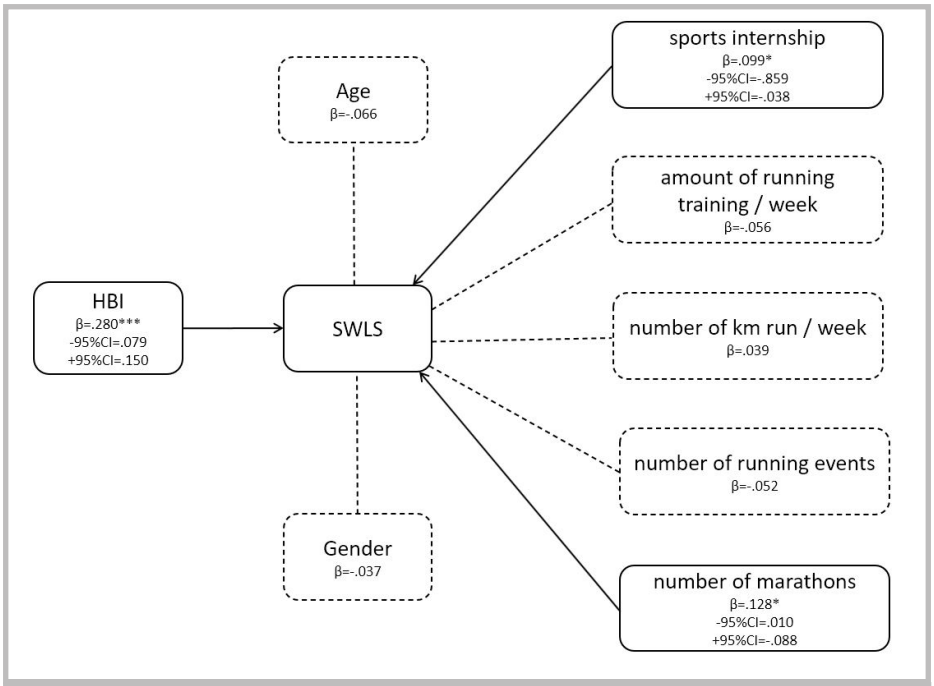

Figure 1. The assumed research model in which the SWLS life satisfaction index was assumed as the dependent variable.

The next stage of the analysis involved expanding the general HBI index within the regression model described above by categorizing it into four types of health behaviors: **Healthy Diet (HD)**, **Preventive Behaviors (PB)**, **Positive Mental Attitude (PMA)**, and **Health Practices (HP)** (**Figure 2**). This model, which aimed to explain life satisfaction, was also statistically significant and accounted for **18% of the variability** in the SWLS index (***R*²= .181; *df* = 11; *F*= 9.997; *P*= .000**) statistical significance at the level *P*≤ .001.

In addition to the individual categories of health behaviors, the model incorporated variables such as **indicators characterizing the level of involvement in the practiced discipline**, **training experience**, **age**, and **gender**. Among the **11 predictors**, only two were found to be statistically significant: **the number of marathons completed in a career (*B*= .049; *β*= .129; *t*= 2.592; *P*= .009)** statistical significance at the level *P*≤ .01 and **Positive Mental Attitude (PMA) (*B*= 3.364; *β*= .408; *t*= 7.403; *P*= .000) statistical significance at the level *P*≤ .001**.

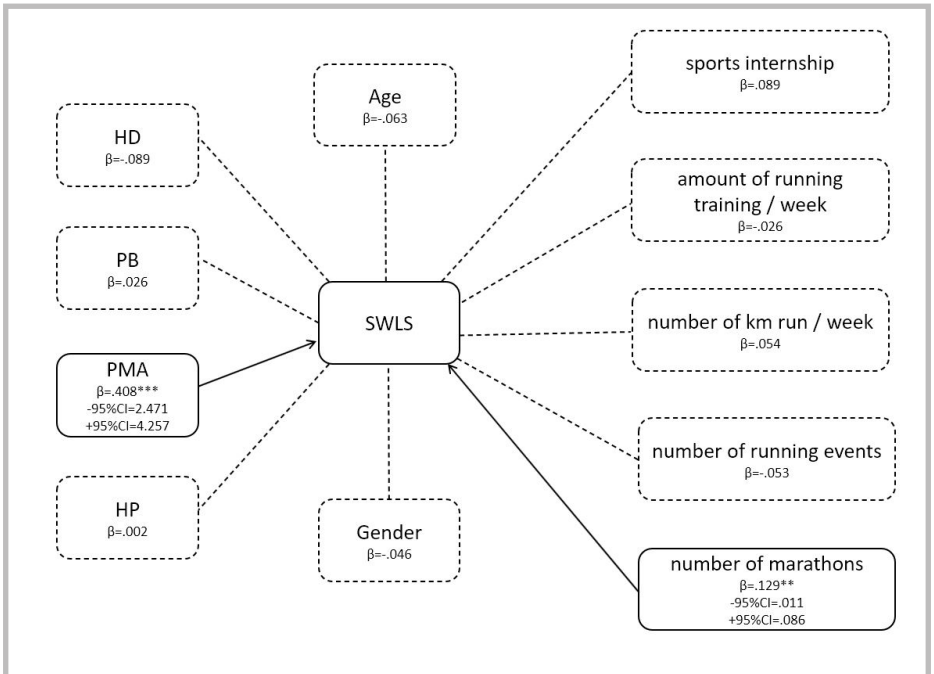

Figure 2. Regression model in which the SWLS life satisfaction index was assumed as the dependent variable, taking into account the analyzed categories of health behaviors.

Discussion

Physical activity is widely recognized as a fundamental element of a healthful lifestyle.[14] The physiological benefits of engaging in physical activities during leisure time have been extensively documented in scholarly literature.[15] Meeting leisure needs, such as through marathon participation, is considered essential for personal well-being and health.[16]

The growing popularity of active leisure is driven by two main factors: the increasing trend toward physical fitness and the pursuit of pleasure and emotional satisfaction. Inoue et al.[17] highlight that social identification, such as belonging to a sports group, plays a more critical role in health and well-being than the frequency of training itself. This may explain why many amateur runners aspire to become marathon participants. Our findings demonstrate that the number of completed marathons is more strongly associated with life satisfaction than participation in shorter-distance competitions.

Numerous factors contribute to life satisfaction, including socio-demographic attributes such as age and gender, psychological traits, healthy lifestyle preferences, engagement in physical activities, regular exercise, participation in leisure pursuits, and the gratification derived from these activities.[18-20] However, in our research, neither age nor gender emerged as determinants of higher life satisfaction among runners. Instead, training experience and exposure to varied sports-related challenges appear to have greater significance.

A review of the literature reveals that engaging in various physical activities, such as running, walking, or cycling, positively impacts life satisfaction and overall quality of life.[21,22] For instance, Pori et al.[23] demonstrated that life satisfaction among marathon runners correlates with the number of training sessions, increasing almost proportionally with the distance run per week. However, our findings indicate no significant relationship between training work indicators (e.g., weekly mileage, number of training days) and life satisfaction. This discrepancy may stem from the potentially less enjoyable nature of rigorous training routines and high psychophysical loads.

Several studies have consistently shown that physical activity, including running, significantly contributes to mental well-being and life satisfaction.[24,25] The release of endorphins and stress reduction mechanisms are well-documented physiological benefits of regular exercise, which likely contribute to enhanced life satisfaction.[26] However, Ekkekakis and Lind, [27] caution that the psychological benefits of exercise may not increase linearly with activity levels and can plateau beyond a certain threshold. This phenomenon of diminishing returns might explain why higher levels of training intensity or frequency were not associated with greater life satisfaction in our study.

Furthermore, variables such as age and gender have independently been shown to influence psychological well-being, often interacting with physical activity in complex ways.[28] These interactions could obscure the direct effects of running frequency or distance on life satisfaction.

Beyond the purely athletic domain, road running events, particularly marathons, offer substantial social and community benefits. Organizing regular sports and recreational events has been shown to support sustainable community development.[29,30] Specifically, marathons often serve as a platform for fostering social connections and promoting well-being in local communities.[30,31]

Promoting societal well-being requires the adoption of healthy behaviors and the cultivation of lifestyles that prioritize physical and mental health. Such behaviors are essential for enhancing life satisfaction.[32] Healthy lifestyle behaviors include maintaining a nutritious diet, managing stress effectively, engaging in regular physical activity, nurturing interpersonal relationships, and taking responsibility for one's overall well-being.[33] Research consistently confirms the positive impact of physical activity on both bodily functions and life satisfaction, as well as its role in fostering pro-health behaviors that contribute to a healthy lifestyle.[34]

Studies have also established a bidirectional relationship between health behaviors and life satisfaction.[35] In our study, we observed that a composite of health behaviors contributes to improved life satisfaction among runners. However, deeper analyses revealed that a positive mental attitude (PMA) was the most significant factor associated with life satisfaction. Long-distance running is widely known to bolster mental resilience and stress tolerance, and many reports highlight the intrinsic motivation of runners to test their physical and psychological limits.[36] For example, Tian et al.[37] found that social support was a significant determinant of life satisfaction among marathon runners.

The findings of this study suggest that participation in marathon events plays a significant role in determining life satisfaction. Marathons, as sports and recreational events, often serve as platforms for promoting pro-health values. They can foster various pro-health behaviors, especially when organized as large-scale "mega-events" that span several days and feature extensive programs. While much depends on how the event is organized, it is noteworthy that most contemporary marathon organizers aim to achieve pro-health objectives. These include promoting running as a health-enhancing activity rather than solely focusing on competitive outcomes.[38,39] The results of this study emphasize the importance of incorporating broader educational strategies to promote pro-health behaviors, which, in turn, could contribute to enhanced life satisfaction.

Nevertheless, this study has certain limitations. Future research should consider factors such as participants' sports performance levels and personal indicators of success in their chosen pursuits, as these may provide further insight into the relationship between marathon participation and life satisfaction.

Practical Applications

This study highlights the potential of marathon participation to improve life satisfaction. Event organizers can enhance participants' well-being by providing support not only for physical training but also for mental health. Offering education on healthy habits and promoting a positive mindset could help runners improve both their physical health and overall life satisfaction. Additionally, marathon events can serve as a motivational tool for adopting healthier behaviours.

Conclusions

It is essential to promote running as one of the simplest and most accessible forms of exercise and to teach runners how to adopt an optimal mindset when participating in competitive events. Well-organized running events can play a pivotal role in motivating participants to engage more deeply in their training routines and adopt healthier behaviors. Despite their demanding nature, marathons hold considerable potential for enhancing individuals' quality of life, particularly when event organizers prioritize health education and equip participants with the necessary skills and knowledge to lead healthier lives.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Ethical Committee approval

Written approval for data collection was obtained from the Research Ethics Committee of Opole University of Technology (No. 5/2024).

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Conflicts of interest

The authors have no conflicts of interest to declare.

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Author-s contribution

Conceptualization, P.F.N. and T.G.; methodology, P.F.N.; software, P.F.N.; validation, P.F.N. and T.G.; formal analysis, P.F.N.; investigation, P.F.N., T.G., D.S.B., and T.C.; resources, P.F.N., T.G., and D.S.B.;data curation, P.F.N., T.G., and T.C.; writing—original draft preparation, P.F.N., T.G., D.S.B., and T.C.; writing— review and editing, P.F.N., T.G., D.S.B., and T.C.; visualization, P.F.N., T.G., D.S.B., and T.C.; supervision, P.F.N., T.G.; All authors have read and agreed to the published version of the manuscript.

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