

## Original Article

## Swimming in Morphofunctional Development from the Perspective of Specialists: An Investigative Approach

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### Abstract

The aim of this study was to identify specialists' opinions regarding the role of swimming in the development of morphofunctional capacity in young adults aged between 25 and 30 years. The research had a descriptive-observational design and was conducted using a questionnaire-based survey. A total of 101 specialists in the field of physical education and sport participated in the study. The research instrument included nine closed-ended items addressing the perceived effects of swimming on physiological systems, aerobic capacity, recovery processes, psychological benefits, muscular development, and motivational factors. The results indicated a high level of consensus, with swimming being considered a highly effective means of improving morphofunctional capacity, reducing stress, and promoting balanced physical development. The conclusions highlight the importance of swimming as a complex physical activity with significant health benefits.

### 1. Introduction

Swimming represents one of the most comprehensive forms of physical activity, being used for recreational, educational, and therapeutic purposes due to its complex effects on the human body. In the current context, characterized by increasing sedentary behavior and associated health problems, physical activity plays an essential role in maintaining health and improving quality of life (Bay, 2016, Bíró, Révész, & Hidvégi, 2015). Morphofunctional indices significantly influence athletes' orientation toward specific types of sports and may act as limiting factors in achieving high-level performance (Kalinichenko & Savchuk, 2013). In this regard, the assessment and development of these parameters

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represent an important objective within the training process. Swimming is a widely practiced sport worldwide and allows for the evaluation of its suitability across different age groups and training levels, contributing to the identification of young athletes' development potential (Jiménez-Braganza, Sáez-Díaz, & Munuera-Martínez, 2025; Politko, 2015). The characteristics of the aquatic environment promote a global engagement of the body and support the balanced development of functional capacities. In the context of current concerns regarding population health, maintaining quality of life, particularly among adult women, is a priority, given their complex roles in society (Mozolev et al., 2021; Vysotskaya, Shutova, & Golubnichy, 2020). Regular physical activity contributes significantly to the prevention of metabolic imbalances and the improvement of body composition (Slusar & Vizitiu, 2025), while nutritional factors may influence the body's immunological responses (Ibrahim, 2026). Furthermore, engaging in physical exercise, including swimming and high-intensity interval training, contributes to improvements in morphofunctional status, physical and mental performance, and the harmonious development of personality (Rebryna et al., 2026). In particular, survival swimming represents an effective means of increasing motor autonomy and functional capacity (Vizitiu & Galeru, 2019; Vizitiu et al., 2023). The World Health Organization emphasizes that insufficient physical activity represents a major public health issue, being associated with increased health risks. In this context, promoting regular physical activity is essential for maintaining health and supporting healthy aging (Skaliy et al., 2024). Considering these aspects, swimming stands out as a complex physical activity with multiple beneficial effects on the body, highlighting the need to investigate its role in the development of morphofunctional capacity from the perspective of specialists in physical education and sport.

## **2. Material and methods**

The research had a descriptive-observational design and was conducted using a questionnaire-based survey method.

The aim of the study was to identify specialists' opinions regarding the role of swimming in the development of morphofunctional capacity in young adults aged between 25 and 30 years.

A total of 101 respondents participated in the study, all specialists in the field of physical education and sport, whose opinions were analyzed within the research framework. The following research methods were employed.

The literature review method was used to establish the theoretical foundation of the study, through the consultation and analysis of relevant works in the fields of physical education, sports training, and exercise physiology, in order to outline the conceptual framework and provide scientific support for the investigated topic.

The questionnaire survey method was applied for the collection of empirical data. The research instrument consisted of a questionnaire comprising nine closed-ended items addressed to specialists, aiming to identify their opinions regarding the role of swimming in the development of morphofunctional capacity.

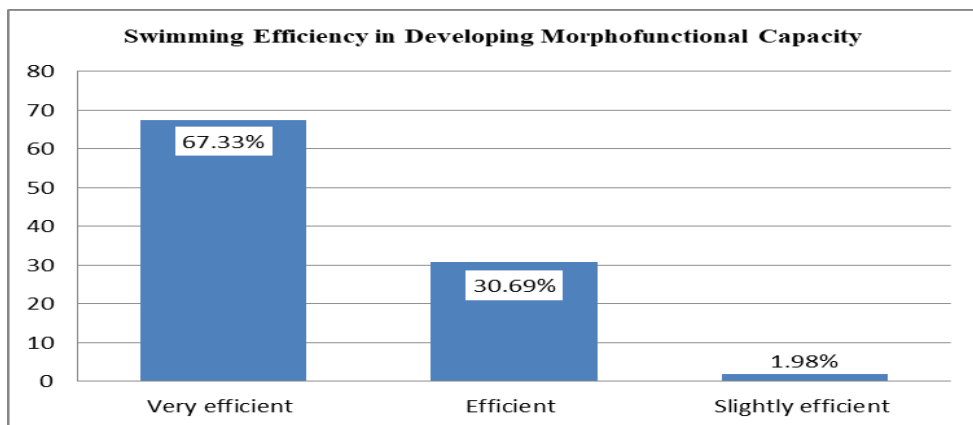
The mathematical-statistical method was used for data processing and interpretation. Data analysis was performed using descriptive statistics, based on absolute (n) and relative (%) frequencies. Additionally, to assess the precision of the results, the margin of error and 95% confidence intervals were estimated using the following formula:

$$IC = p \pm z \cdot \sqrt{\frac{p(1-p)}{n}}$$

where  $z = 1.96$  for a 95% confidence level. In the data analysis, distribution trends, the dominant value (mode), the degree of concentration and dispersion of responses, as well as the level of consensus among respondents were also examined. Participation in the study was voluntary, and all respondents were informed about the purpose of the research and provided their consent to participate. Data were collected anonymously, in accordance with the principles of confidentiality and personal data protection. The study was conducted in compliance with ethical standards specific to scientific research.

### 3. Results and Discussions

The obtained results highlight clear and consistent trends in specialists' perceptions regarding the role of swimming in the development of morphofunctional capacity in young adults.



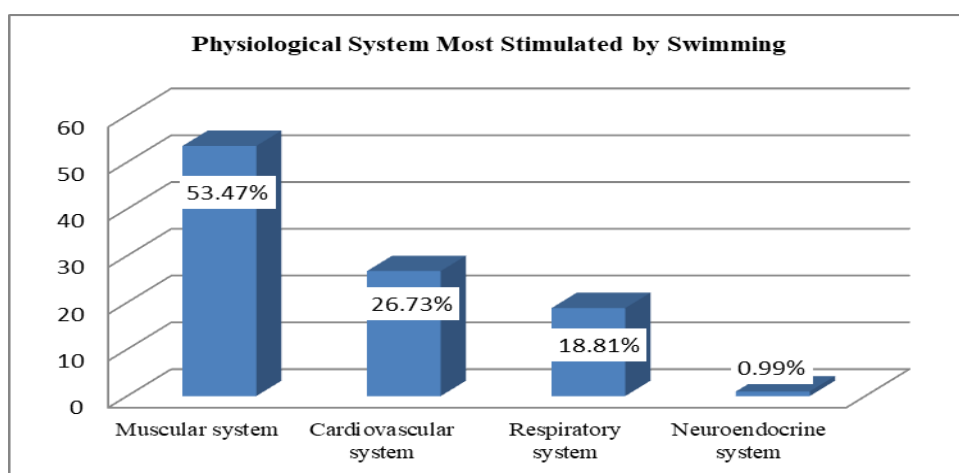
**Figure1.** *Perceived effectiveness of swimming in developing morphofunctional capacity*

The descriptive statistical analysis of frequencies for the item regarding the effectiveness of swimming in developing morphofunctional capacity in young adults (Figure 1) reveals a distribution strongly concentrated in the area of positive responses.

Thus, 67.33% of respondents' evaluated swimming as "very effective," while 30.69% considered it "effective," resulting in a cumulative percentage of 98.02% for favorable evaluations. Only 1.98% of respondents indicated the option "slightly effective," while lower categories were not selected.

This distribution indicates a clear tendency toward positive skewness and a high concentration in the upper evaluation categories. From a statistical perspective, the results reflect a high level of consensus among respondents and support the hypothesis that swimming is perceived as an effective means of developing morphofunctional capacity in young adults.

The proportion of respondents who consider swimming "very effective" (67.33%) falls, at a 95% confidence level, within the interval [58.16% – 76.50%], confirming the stability of the identified trend.



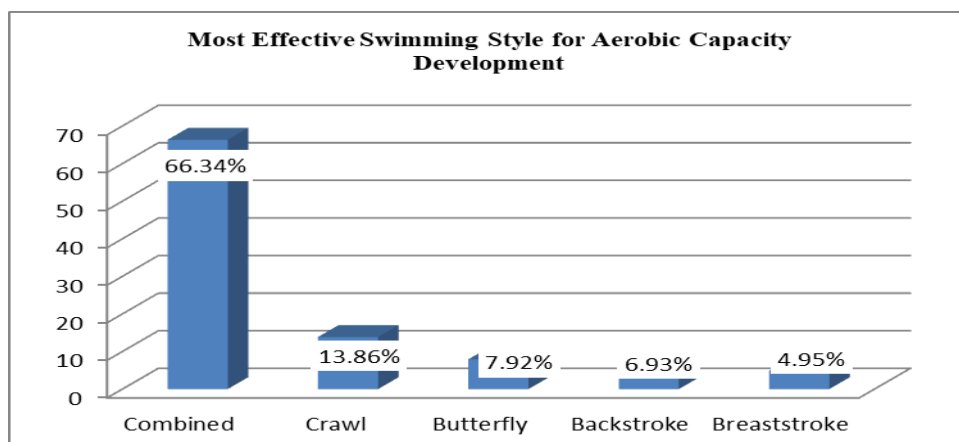
**Figure 2.** *Physiological system most stimulated by swimming*

The descriptive statistical analysis of frequencies for the item referring to the physiological system most stimulated by swimming practice (Figure 2) reveals a non-uniform distribution of responses, with a predominant concentration on the muscular system 53.47%. This is followed by the cardiovascular system 26.73% and the respiratory system 18.81%, while the neuroendocrine system is mentioned in a negligible proportion 0.99%.

From a statistical perspective, the distribution indicates a clear dominance of a single category, namely the muscular system, accompanied by a relevant secondary distribution toward the cardiovascular and respiratory systems.

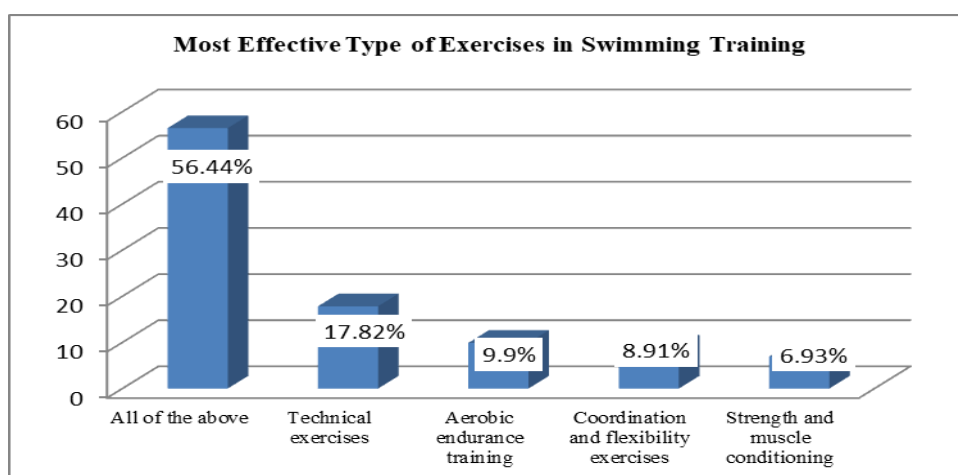
These results suggest a hierarchical perception of the effects of swimming on the body, with primary emphasis on the muscular component, while also acknowledging the important contributions of cardio-respiratory functions.

For the "muscular system" category 53.47%, the 95% confidence interval is [43.74% – 63.20%], indicating the persistence of this option as dominant in respondents' perceptions.



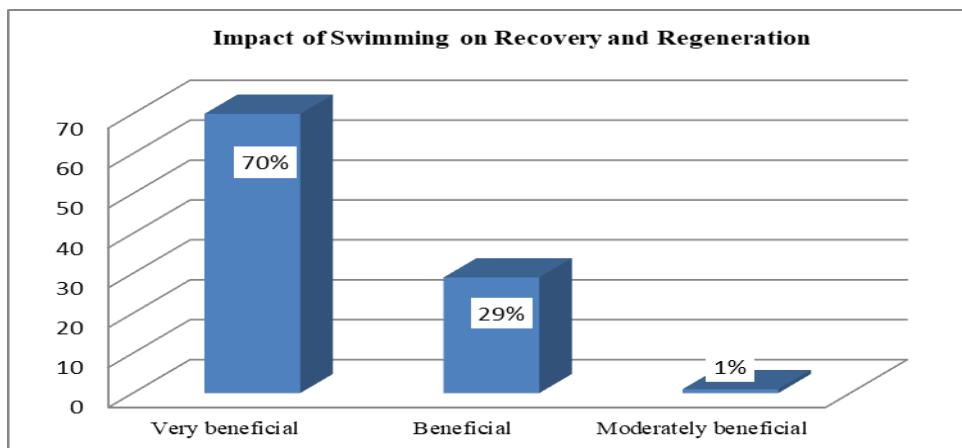
**Figure 3.** *Most effective swimming style for aerobic capacity development*

The distribution of responses for the item referring to the swimming style considered most effective for the development of aerobic capacity highlights a predominant concentration around the “combined” option 66.34%, (Figure 3). The other options recorded significantly lower proportions, namely freestyle 13.86%, butterfly 7.92%, backstroke 6.93%, and breaststroke 4.95%. From a statistical perspective, the distribution indicates a clear dominance of a single category, accompanied by a relatively uniform dispersion of the remaining responses. This structure suggests a strong preference for the combined use of swimming styles, perceived as more effective in developing aerobic capacity compared to the isolated use of a single style. The “combined” option 66.34% shows a 95% confidence interval ranging from 57.13% to 75.55%, supporting the predominance of this choice.



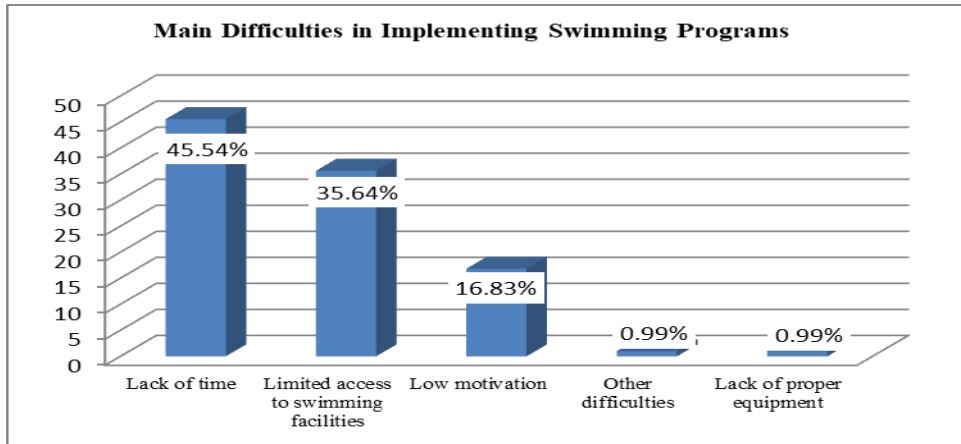
**Figure 4.** *Most effective types of exercises in swimming training*

The frequency distribution for the item referring to the type of exercises considered most effective in swimming training highlights a predominant concentration on the option “all of the above” 56.44%, indicating a majority preference for an integrated training approach (Figure 4). The other options recorded significantly lower proportions, namely technical exercises 17.82%, aerobic endurance sessions 9.90%, coordination and flexibility exercises 8.91%, and strength and muscle toning sessions 6.93%. From a statistical perspective, the distribution of responses indicates a clear dominance of a single category, accompanied by a relatively balanced dispersion of the other options. This structure suggests that respondents favor the combination of different types of exercises, emphasizing the importance of integrating technical, aerobic, strength, and coordination components for the optimal development of morphofunctional capacity. The “all of the above” option (56.44%) presents a 95% confidence interval of [46.76% – 66.12%], confirming the orientation toward an integrated approach.



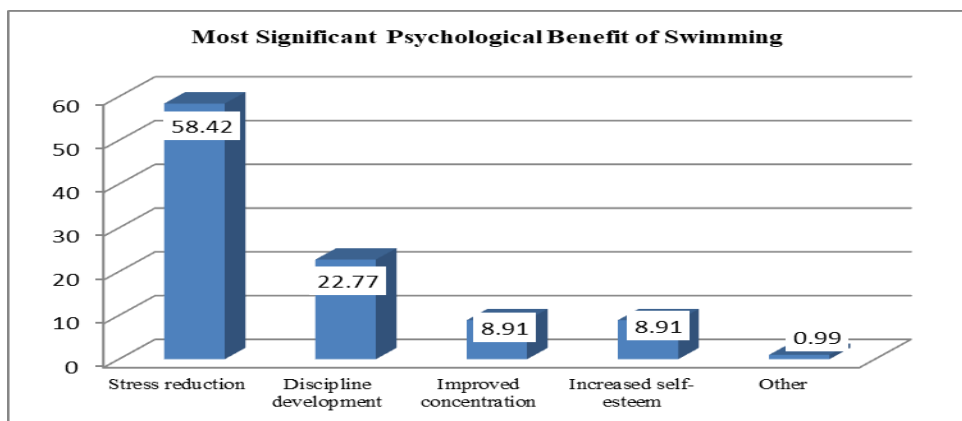
**Figure 5.** *Impact of swimming on recovery and regeneration*

The results of the frequency analysis for the item regarding the impact of swimming on recovery and regeneration highlight a distribution strongly oriented toward positive evaluations (Figure 5). Thus, 70.00% of respondents assessed the effect as “very beneficial,” while 29.00% considered it “beneficial,” resulting in a cumulative percentage of 99.00% for favorable responses. Only 1.00% of participants indicated the option “moderately beneficial,” with no negative responses recorded. From a statistical perspective, this distribution reflects a strong concentration in the upper evaluation categories and a very high level of consensus among respondents. The results confirm the prevailing perception that swimming represents an effective means of supporting recovery and functional regeneration processes after effort. The proportion of respondents who consider swimming “very beneficial” (70.00%) falls, at a 95% confidence level, within the interval [61.02% – 78.98%], highlighting a consistently favorable assessment.



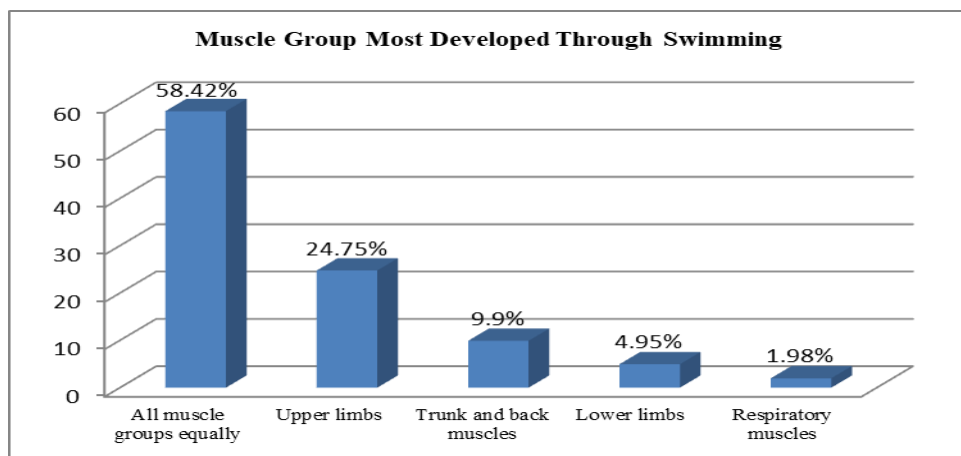
**Figure 6.** *Main difficulties in implementing swimming programs*

The analysis of the frequency distribution for the item referring to the main difficulties in implementing swimming programs highlights a clear hierarchy of limiting factors. Thus, lack of time represents the main barrier, indicated by 45.54% of respondents, followed by limited access to swimming facilities 35.64%, reflecting the predominance of organizational and infrastructural constraints. To a lesser extent, low motivation is mentioned by 16.83% of participants, suggesting the influence of psychological factors on participation in aquatic activities. The other options, namely other difficulties and lack of appropriate equipment, register marginal values 0.99% each. From a statistical perspective, the distribution of responses indicates a concentration of frequencies in the first two categories, highlighting that the main obstacles are related to time availability and access to infrastructure, while secondary factors have a reduced impact. For the “lack of time” category 45.54%, the 95% confidence interval is [35.82% – 55.26%], confirming its role as the primary limiting factor.



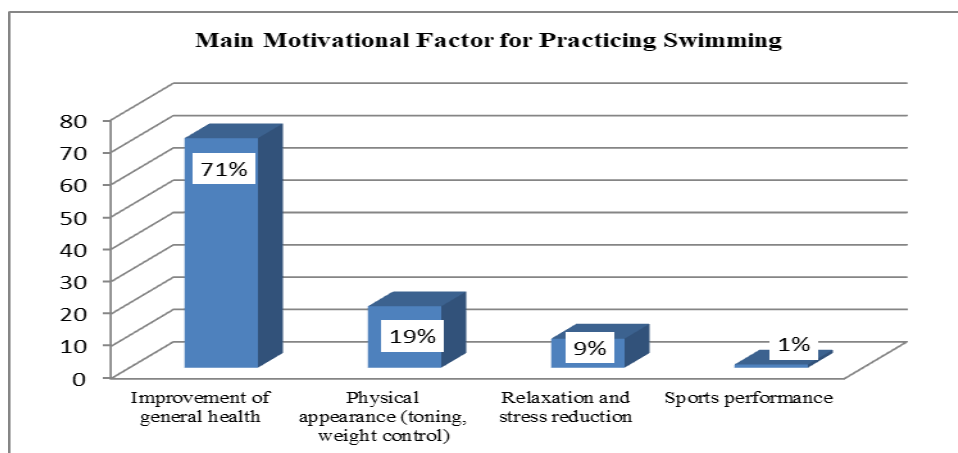
**Figure 7.** *Most significant psychological benefits of swimming*

For the item referring to the most significant psychological benefit of swimming practice, the frequency analysis shows that the majority of respondents indicated stress reduction 58.42%, which is perceived as the main positive psychological effect of aquatic activity. Additionally, the development of discipline was mentioned by 22.77%, highlighting the formative role of regular swimming practice. Other identified psychological benefits include improved concentration and increased self-esteem, each selected by 8.91%, indicating relevant contributions to cognitive functions and emotional balance. A very small proportion of participants 0.99% indicated other benefits. The distribution of responses shows that swimming is primarily perceived as an effective means of reducing stress, but also as an important factor in the development of self-control and higher psychological functions. The “stress reduction” option 58.42% presents a 95% confidence interval of [48.80% – 68.04%], supporting the dominant importance of this benefit.



**Figure 8.** *Muscle groups most developed through swimming*

The frequency distribution for the item referring to the muscle group most developed through swimming highlights a predominant concentration on the option “all equally” 58.42%, indicating the dominant perception of swimming as an activity that provides a global load on the body. The next most frequent category is the upper limbs 24.75%, reflecting their importance in generating propulsion in the aquatic environment. The trunk and back muscles account for 9.90%, emphasizing their role in stabilization and postural control, while the lower limbs 4.95% and respiratory muscles (1.98%) show lower values. From a statistical perspective, the distribution indicates a clear dominance of a single option, accompanied by a decreasing dispersion of the other categories, suggesting that although certain muscle groups are perceived as more involved, responses converge toward the idea of a balanced development of the entire muscular system. For the “all equally” option (58.42%), the 95% confidence interval is [48.80% – 68.04%], confirming the perception of the global nature of muscular involvement.



**Figure 9.** *Main motivational factors for practicing swimming*

The frequency distribution for the item referring to the most important motivational factor for practicing swimming highlights a predominant concentration on the category “improvement of general health” 71.00%, indicating that responses are primarily oriented toward health-related benefits. The other options recorded significantly lower proportions, namely physical appearance 19.00% and relaxation and stress reduction 9.00%, while sports performance was mentioned marginally 1.00%. From a statistical perspective, the distribution indicates a clear dominance of a single variable, accompanied by a decreasing dispersion of the other categories. This structure suggests that the main motivation for practicing swimming is predominantly associated with maintaining and improving health status, while aesthetic, psychological, or competitive objectives occupy a secondary place in respondents’ perceptions. The “improvement of general health” category 71.00% falls, at a 95% confidence level, within the interval [62.10% – 79.90%], highlighting the predominance of this motivation.

### **Discussions**

Swimming, as a rhythmic and dynamic form of endurance exercise involving a large muscle mass, represents an effective alternative to land-based exercise; however, it presents specific physiological characteristics determined by water immersion and body position, which limit the direct extrapolation of results obtained in terrestrial training (Tanaka, 2009). At the same time, regular physical activity, including swimming, is associated with significant beneficial effects in the prevention of chronic diseases and premature mortality, being considered an essential factor for maintaining overall health (Warburton, Nicol, & Bredin, 2006).

### **4. Conclusions**

The results indicate a high level of consensus regarding the effectiveness of swimming, with most respondents considering it a highly effective means of optimizing morphofunctional parameters. Physiologically, swimming primarily

stimulates the muscular system, while also contributing significantly to cardiovascular and respiratory development, confirming its complex and integrative nature. The findings highlight the importance of a combined training approach, integrating technical, aerobic, strength, and coordination components. Swimming is also recognized as an effective method for recovery, with notable psychological benefits such as stress reduction and discipline development. Despite these advantages, program implementation is limited mainly by time constraints and restricted access to facilities. Overall, swimming is perceived as a balanced and comprehensive activity, with health improvement being the main motivational factor. However, the results should be interpreted considering the sample size, which implies a margin of error of approximately  $\pm 9\text{--}10\%$ .

The present study has several limitations that should be considered when interpreting the results. First, the sample size ( $N=101$ ) implies an estimated margin of error of approximately  $\pm 9\text{--}10\%$ , which limits the generalizability of the findings.

Additionally, the data are subjective, being based on specialists' opinions rather than direct experimental measurements of morphofunctional parameters. Future research should involve larger sample sizes and include more diverse participant groups (athletes, non-athletes, and different age categories) to enhance the representativeness of the results.

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