Health Promotion and Physical Activity
ISSN 2544-9117 ▪ 2024; 26 (1): 1-9
doi: 10.55225/hppa.583

HPPA • 2024; 26 (1): 1-9

Opinions of pregnant women and young mothers on infant participation in water-based physical activity

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Abstract

Aim: The aim of the present study was to obtain the opinions of pregnant women and young mothers of infants regarding physical activity in water and to analyze the influencing factors.

Material and methods: The study included 250 pregnant women and mothers of infants. It was conducted by means of a self-administered, anonymous questionnaire containing closed or semi-open single- or multiple-choice questions. Participation in the study was voluntary and eligibility was purposive. The survey was implemented among participants of the birthing school, as well as among Internet users on forums and social networks. The collection of material for the study took place between January and April 2023.

Results: The conducted research shows that people who are more willing to use swimming pools are more likely to declare willingness to participate in physical activities in the water with the child, parent's contact with the water environment in early childhood has a positive impact on their attitude towards infant swimming, parents who swim better declare a greater willingness to take their infant to the swimming pool, mothers declaring a low level of knowledge about issues related to with children's water activity, they are afraid to go swimming with them, but this does not affect their attitude towards their children's physical activity in water, the popularity of swimming lessons has increased in recent years, the topic of infant swimming is more widespread in larger cities.

Conclusion: A parent's contact with the water environment in early childhood (before the age of 3) has a positive impact on the parent's attitude towards infant swimming.

Oryginal article

Keywords

- physical activity in water
- infant swimming
- early childhood development support

Contribution

A – Preparation of the research project
B – Assembly of data
C – Conducting of statistical analysis
D – Interpretation of results
E – Manuscript preparation
F – Literature review
G – Revising the manuscript

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Article info

Article history

- Received: 2024-04-01
- Accepted: 2024-05-22
- Published: 2024-06-04

Publisher

University of Applied Sciences in Tarnow
ul. Mickiewicza 8, 33-100 Tarnow, Poland

Conflict of interest

None declared.

Financing

This research did not receive any grants from public, commercial or non-profit organizations.

Introduction

Ontogeny, or human development, is a series of numerous changes that take place in the human body from the moment of fertilization of the ovum until death. This process consists of two periods, prenatal and postnatal, which are successively divided into several sub-periods. The prenatal period, that is, the part of personal development that lasts from conception until the child is born, takes place in the womb and consists of numerous cell divisions, their growth and differentiation.[1] The child's organism, formed in the womb during the prenatal period, possesses all the human characteristics and reflexes that develop very intensively in the first years of life in every area: somatic (physical), motor (motor), mental (mental and emotional), cognitive (attention, perception and memory) and social.[2]

The period from birth to the first year of life is characterized by a particularly rapid pace of development, when the child evolves from a defenseless being, completely dependent on others, based only on reflexes, into an individual able to move, grab and release objects, demonstrate his emotions, and even communicate with the environment in a simple way. Physical development includes growth, changes in body proportions, weight gain and changes in the functioning of tissues and organs. The first year of a child's life is characterized by very large increases in both weight and height – birth weight doubles in approximately the 3rd or 4th month of life, and then triples. Around three months of age, the circumference of the chest becomes larger than the circumference of the infant's head. The infantile period is characterized by a rapid maturation of the motor and sensory centers in the central nervous system, which is reflected in the wealth of manifestations of psychomotor development. The child's main achievements during this developmental period are grasping and releasing objects, mastering the ability to move independently and uprighting the body. The child uses a straight grip at 4–5 months of age, a hand-elbow grip at 5–6, followed by a scissor grip at 6–8 and finally, around the age of one, mastering the so-called pincer grip (characteristic only of humans).[3,4] In terms of locomotion, from the age of 3–4 months the child turns from the back to the sides, in the following months he/she turns from the back to the stomach and vice versa, sits and crawls from the age of 8 months, then crawls and tries to stand up holding on to the backrest, in the 11th month he/she stands without a backrest and tries to take the first steps. In terms of upright standing and posture control, a child from the age of 3 months can keep its head stiffly raised to a vertical position, at the 8th month can sits unaided, from the 10th month can stand holding on to the backrest, and at the 11th month can stand unaided. [3,4]

There are numerous articles in the literature on the development of all motor skills in infants, especially gross and fine motor skills, as well as coordination skills.[5,6] One of the earliest actions positively influencing the motor development of an infant is, for example, placing him or her on the stomach, which parents do without even realizing it. It is in this position that the child develops antigravity mechanisms, from which he or she starts to crawl, quadruple, sit up and finally stand up. The Bobath NDT method for infants is very popular among paediatric specialists, which can be successfully used both to support the normal psychomotor development of a healthy child and to improve the child from the so-called risk group.[7]

The aquatic environment, although not natural for terrestrial beings, including humans, is an environment readily used by them. This is due to its effect on the body submerged in water. Owing to its properties and the resulting beneficial effects on the human body, water is readily used both for recreation and in the process of rehabilitation (restoration of fitness) of people affected by various diseases and ailments.[8,9]

The properties of water include several physical characteristics such as buoyancy, hydrostatic pressure, water resistance, temperature and viscosity. Each of these properties, used appropriately, can have a significant impact in the process of improvement, including supporting normal human development. There are reports on the positive effects of water activities on infants.[10-12] Motor activity of infants in water has a beneficial effect on their psychophysical development, both fine and gross motor skills, eye-hand coordination and cognitive flexibility. It builds in the child greater self-confidence, helps arouse curiosity, satisfies the need for movement and new experiences, and also develops personality. In contact with other children, during group activities, it supports the emotional development of the child and improves his communication skills. Games and activities in the water provide children and their caregivers with a lot of joy and help shape their relationships based on mutual trust. It is also worth emphasizing that, in addition to the direct impact on infants participating in water exercise activities, the promotion of this type of activity is part of health education, which in the long term improves the safety and health of society as a whole.[13] Like any other activity, infant swimming also carries certain dangers. One of them is the possibility of complications such as water intoxication with hyponatremia,[14,15] hypothermia, infectious diseases,[16] or frequent otitis media or recurrent

infections of the upper respiratory tract.[17,18] Indirectly, participation in such activities can also contribute to a child's sense of insecurity and overconfidence in the water and swimming skills, which may even lead to drowning.[19] Here, it is imperative to remember that even despite children's high degree of familiarity with water and excellent swimming skills, adult supervision of their swimming in water bodies is always crucial.

The aim of this study was to find out the opinions of pregnant women and young parents towards infant physical activity in water. In addition, the influence of factors such as parents' knowledge, skills and experiences was analyzed. The following research questions were formulated:

1. What are the attitudes of mothers towards their children's physical activity in water?
2. Are mothers who can swim more likely to take their infant to a swimming pool?
3. Can a low level of knowledge determine the fear of taking an infant to the pool?
4. Does parental contact with the water environment in early childhood (before age 3) has a positive impact on the parent's attitude towards infant swimming?

Materials and methods

The study included 287 women. An anonymous self-administered questionnaire was used to conduct the study on the attitudes of pregnant women and young mothers towards infant participation in water-based physical activity. In addition, questions were asked about the parent's attitude towards physical activity and one of its forms such as swimming, the parent's swimming skills, their knowledge of infant swimming, the availability of swimming facilities, as well as sociodemographic data. The survey was conducted among participants of the childbirth school at the Edward Szczeklik Specialist Hospital in Tarnów (Poland), as well as among Internet users on forums and social networking sites for pregnant women and mothers of babies. Each of the women surveyed gave consent to participate in the study. All procedures contributing to the study complied with the ethical standards of the relevant national and institutional committees on human experimentation and the Helsinki Declaration of 1975, as revised in 2008. The inclusion criteria for the study were current pregnancy or delivery within the last twelve months, as well as voluntary consent to participate in the study. The study included only fully completed questionnaires, excluded incomplete questionnaires and those that did not meet the inclusion criteria, of which there were 37.

A total of 250 women took part in the study, comprising 196 pregnant women and 56 women who had given birth in the past 12 months, including 2 women who are pregnant again. The majority of respondents were women who were pregnant for the first time or had their first child (63.6%). The largest proportion of respondents were women aged 26–30 (40.8%) and had a university education (62.8%) and lived in cities with up to 200,000 inhabitants (56.4%), mainly Tarnów. Statistical analysis was performed using IBM SPSS Statistics version 22. The study of the relationship between nominal qualitative variables was carried out using the chi-square independence test. Spearman's correlation coefficient was used to compare ordinal qualitative features. The level of significance in this study is taken as $\alpha = 0.05$, however, results in the range of $0.05 < p < 0.1$ are considered significant at the level of statistical tendency.

Results

Opinions of mothers towards their children's physical activity in water

More than 90% of respondents (including moderate beneficial 72.8% and 8.4 extremely beneficial) are of the opinion that physical activity in water can have a beneficial effect on infants. Only two stated that this influence could be unfavorable, and 8.8% of the respondents stated that water activity has no effect on infants.

When asked if they would like their children to be able to swim in the future and attend the swimming pool regularly, more than half of the respondents (54%) said yes. Only 8.4% of the respondents stated that they were indifferent, no one answered no or rather no.

Almost half of the women surveyed (46.4%) declared that they wanted to take their child to the swimming pool for the first time only at the age of 1 to 3 years. Willingness of parents to take the child before the age of one was declared by only 54 respondents, which accounted for 21.6% of the surveyed group. Thirteen respondents do not plan their first visit until their child goes to school and none indicated that they do not plan to take their child to the pool. Only 44.8% of the respondents had heard of swimming classes for infants, and even fewer, 38.8 %, said they would be willing to participate in such classes.

Respondents who answered no to the question regarding their willingness to participate in infant swimming classes (153 respondents) were asked an additional question as to why they would not want to participate

in these classes. They could indicate several answers (Table 1). It was also possible to indicate an additional, self-reported answer, with 8 respondents declaring that they did not or would not have the time to do so. The greatest influence on giving a negative answer in the question about the willingness to participate with an infant in swimming pool activities was the fear of hurting the child (99.3%) and too little knowledge of the mother on the subject (84.3%). For every other respondent (56.2%) the reason was the inability to swim. It was also possible to enter a different answer in this question, and 14 respondents declared that they were afraid of their child choking or drowning during such classes.

Table 1. Reasons for reluctance to participate in infant swimming classes in opinion of pregnant women and young mothers (N = 153, respondents could give several answers)

Response options	Data in %
I'am afraid of hurting my child these classes	99.3
I don't know enough knowledge about it	84.3
I don't know how to swim myself	56.2
I can't swim	56.2
These classes are too expensive for me	39.9
I'm afraid of water	19.0
I prefer other activity	15.0
I' am afraid of my child getting sick after these classes	14.4
I have no access to swimming pool suitable for babies	9.8
My child doesn't need it	7.8
I don't feel comfortable in water	2.6

Parents' own experience and skills and their influence on the opinion of their children's physical activity in the water

Almost two-thirds of respondents (63.6%) are willing to go to the swimming pool/water, and 17. 2% even do it willingly. The answers reluctant and very reluctant were given by only 48 respondents. Slightly more than two-thirds of the respondents admitted that they first went to a swimming pool (swam in the sea, a river, a lake, etc.) at preschool age (between 3 and 7 years of age). Thus, only 4.8% of respondents declared, during infancy (before the first year of life), and 2 people have never been to the pool.

More than half of the respondents (54%) declared that they could swim at least one full length of the pool. One in five respondents (20.4%) can swim more than 100 m continuously, and 56 respondents indicated that they cannot swim. The respondents were also asked what styles they could swim. Several answers could be indicated in the question. More than half of the respondents (54%) said that they were able to swim freestyle (the so-called breaststroke). Similarly, 52.4% of the female respondents answered that they can swim in classic style (the so-called frog). Also, 18,8% respondents said that they could not swim and 23.6% that they could only swim with their head above water (Table 2).

Table 2. Swimming skills – swimming styles of pregnant women and young mothers (N = 250, data in %)

Response options	Data in %
Can't swim	18.8
Just with head up	23.6
Breaststroke	52.4
Front crawl	54.0
Backstroke	47.6
Butterfly	6.4

For further analysis, female respondents were divided into groups according to the number of styles they can swim. The largest number of respondents (41.2%) was assigned to the group of those able to swim 3 styles. On the basis of this distribution, it was found that those who can swim at least three styles are significantly more likely ($p = 0.047$) to be willing to take their child to infant swimming classes.

Parents' knowledge and its impact on their attitudes towards their children's physical activity in water

When asked about the sources of knowledge on the proper development of the child and how to support it, the respondents most often (93.6%) declared that they obtain this knowledge from friends and family members. This was followed by the Internet, forums and social networks (82%), as well as textbooks, handbooks and thematic magazines (80.4%).

In this question, respondents could select more than one answer. More than half of the respondents (58%) indicated that they had not come across information on infant physical activity in water in the above-mentioned

sources. In the next question, the respondents declared their level of knowledge on a particular issue related to infant physical activity in water. The least knowledge was on how to practice with a baby in water 89.6% of the respondents said they had little or no knowledge. Only 10% declared average knowledge with one person answering that they had a lot of knowledge.

Also, for questions on how to support the infant in the water and when the infant is ready for the first visit to the pool, almost half of the respondents answered that they had little or no knowledge. For the remaining three questions about contraindications to taking a child to the swimming pool, preparation for such a visit and knowledge of first aid for infants, most respondents declared an average level of knowledge.

In order to analyze the impact of parents' knowledge on their attitudes towards infant water activity, the respondents were divided into three (3) groups depending on how many of the above six questions they answered with a low or no level of knowledge on the subject (Table 3).

Table 3. Women's level of knowledge on infant swimming issues (N = 250, data in %)

Issues related to infant swimming	Knowledge level			
	Lack of knowledge	Little knowledge	Average knowledge	A lot of knowledge
When to take an infant to the pool for the first time	27.2	21.6	40.8	10.4
Contraindications to taking an infant to the swimming pool	4.8	20.4	61.6	9.6
How to prepare an infant for a visit to the pool	7.2	12.8	66.4	13.6
How to support an infant in the water	21.6	43.6	27.2	7.6
How to exercise with an infant in water	49.2	40.4	10.0	0.4
First aid for infants	2.8	30.4	52.4	14.4

For such a determined level of knowledge of pregnant women and young mothers about infant swimming (the number of questions in which respondents declared little or no knowledge of infant swimming), less than less than 2 questions were answered by 17.2% of women, from 2 to 4 questions – 56.8% and more than 4 questions – 26.0% of surveyed women.

Respondents who declared a low level of knowledge in more than 4 questions (26%) were significantly more likely to answer in the survey that they would be afraid to take their child to the swimming pool ($p = 0.00007$). However, there was no statistical effect on their willingness to take their children to infant swimming classes ($p = 0.142$).

When asked what impact physical activity in water can have on a child's body and development (Table 4), the most common answers were improved immunity (91.6%), increased muscle strength and endurance including respiratory muscles (90%), better sleep (85.6%) and aroused curiosity in the child (80.8%). It was possible to select more than one answer to the question and also to add your own. Three respondents answered that it allows the child to relax and unwind, whereas, 34 (13.6%) ticked all possible answers.

Table 4. The impact of physical activity in water on the child's body and development in opinion of pregnant women and young mothers (N = 250, respondents could give several answers)

Response options	Data in %
Enhance immunity	91.6
Increase muscle strength and endurance	90.0
Better sleep	85.6
Spark child's curiosity	80.8
Improve well-being	69.2
Improve body awareness and it's capabilities	67.6
Prevention posture defects	62.4
Stimulation of central nervous system	32.4
Increase child's independences and self confidence	31.6
Improve peristalsis (better work of bowels)	31.2
Greater sense of security and parent child bond	26.0
None of the above	0.0

When asked what are the benefits of a child's mastery of swimming skills, each respondent answered that it provides a sense of safety in contact with water, e.g. during holidays at the sea or lake (Table 5).

Table 5. Benefits of mastering swimming skills in opinion of pregnant women and young mothers (N = 250, respondents could give several answers)

Response options	Data in %
Improve water confidence	100.0
Good way to spend free time actively	90.8
Better fitness and physical ability	88.8
Maintain a good health	62.0
Improve self-esteem	53.6
Maintain a good personal appearance	33.6
No benefits	0.0

The vast majority also indicated the possibility of spending free time actively (90.8%) and better fitness and physical performance (88.8%). None of the respondents answered that it provides no benefits, and 38 gave the additional answer that it increases immunity. Of the women surveyed, 86.4% of the respondents said they would be more willing to introduce their children to the 'water world' than before completing the survey. Only two respondents answered that they tended not to, and none indicated that they definitely did not. The remaining 32 people (12.8%) said that the survey did not influence their opinion (Table 6).

Table 6. The impact of the survey on parents' attitude towards infants' physical activity in water (N = 250)

Responses	Data in %
Definitely yes	28.4
Rather yes	58.0
My opinion has not changed	12.8
Rather no	0.8
Definitely not	0

Only 32 respondents (12.8%) stated that they were not interested in the topic of the above survey, and three out of four respondents (73.6%) said that they would be happy to learn more about this topic.

Discussion

One of the interesting alternatives to spending leisure time and at the same time taking care of one's own health and fitness is physical activity in an aquatic environment, which has been gaining increasing popularity in recent years. Larger cities increasingly have swimming pools offering organized swimming classes for infants[20] and almost every modern swimming pool is equipped with a shallow pool that has warm water suitable for use by the youngest. There is a dearth of literature describing the rules of conduct for introducing children to the water world as well as learning how to swim.[20-25]

The main aim of this study was to analyze in detail the parents' attitudes and their anticipated determinants towards their child's early familiarization with water through participation in infant swimming classes, while at the same time supporting their child's all-round development. The aim of the study was also to draw the respondents' attention to the motor activity of infants in water, to get them interested in the subject and to encourage them to deepen their knowledge of it, and perhaps even to choose such activities for their children in the future. The vast majority of modern parents (94%) are fully aware of the beneficial impact of comprehensive stimulation of the child in the first year of life. One of the undoubtedly beneficial ways is to inculcate in the child pro-healthy attitudes and create a passion for physical activity realized through the so-called lifetime sports such as running, cycling or just swimming.[26] In the age of the internet and good access to information, parents show considerable knowledge of the beneficial effects of physical activities in water on infant development (90.4%), as confirmed by numerous scientific publications.[27,28]

At present, swimming skills are important not only because of their proven health benefits and the almost complete absence of injury in this form of physical activity, but also because of the psychological discomfort that occurs in people who do not have this ability. This is one of the motives that motivate modern parents to enroll their children in swimming.[29,30] The results of our survey confirm this thesis, as the vast majority of respondents (91.6%) declare that they would like their children to master the ability to swim and regularly use this form of physical activity for the sake of their health and fitness.

Despite their great desire to support their child's development, their considerable awareness of the beneficial effects of early familiarization with water and their positive attitude towards their child's mastery of swimming skills, parents relatively rarely declared their intention to take their child to the pool for the first time while still in infancy (21.6%). This attitude could have been influenced by a number of factors, which include: fear of taking an infant to a swimming pool (57.1 % of those declaring that they visited a swimming pool for the first time later than their child's first year of life indicated that they would be afraid to take their infant to a swimming pool) and a low level of knowledge on the

subject (66 % of those who did so indicated a low level of knowledge or lack of knowledge on a minimum of 4 out of 6 topics related to the topic of infant swimming).

Despite the increasing availability of swimming pools and the popularity of the physical activity of swimming, water activities for infants are still quite underpublicized. Only 44.5% of respondents had heard of this type of activity. The results were much better in the group of people living in urban areas, where 79% of respondents declared awareness of the existence of such classes, as opposed to rural areas, where only 19% of respondents had encountered this form of infant activity or had received information about it.

The attractiveness of water-based infant classes and the multiplicity of their beneficial effects on the child's all-round development mean that there is considerable interest among parents in taking part in this form of activity, with 38.8% of those surveyed declaring a desire to participate. Those who are undecided about such a step are most often driven by: fear of hurting their child (99.3%), parents' low level of knowledge on the subject (84.3%), lack of swimming skills (56.2%), their high price (39.9%), and parents' fear of water (19%), preference to choose another form of activity at that time (15%), fear of a higher incidence of their child falling ill after such activities (14.4%), lack of access to swimming pools (9.8%), parents' lack of need to participate in such activities (7.8%), parents' discomfort in the water (2.6%) or simply a lack of time for such activities (an additional response indicated by 8 respondents).

It seems logical to conclude that parents who are aware of their body and its health-promoting needs are more willing and better able to take care of them. A person's awareness of the value of participating in physical culture through various sports such as swimming encourages them to choose these forms of activity in their leisure time. However, the importance of physical activity in parents' lives is not relevant to their attitudes towards their children's participation in physical activity in the water.

Parents' willingness to engage in physical activity in the form of swimming has a significant impact on their attitudes towards their children learning this skill. These parents are aware of the benefits of this activity and want their children to be able to swim and, like themselves, to attend swimming pools regularly in the future. They are also more willing to participate with their toddler in baby swimming classes.

Also, parents' previous experience of aquatic activities, before the age of 3 years, has a positive impact on their attitude towards participating in infant swimming activities with their child. Based on the analysis of this question, one can also try to confirm the thesis that the topic of infant swimming is relatively fresh, as only 12 out of 250 respondents declared that they had been taken to the pool/water before the age of one. Such a response, however, could have resulted both from the fact that it was not fashionable at the time, and from the simple ignorance of the interviewee, because a person's memory, unfortunately, does not date back to the times of his infancy.

The swimming skills of the respondents were verified using information about the distance swum in continuous form and mastered swimming styles/ways of movement in the water. On this basis, respondents were divided into groups: those swimming at least 3 styles (each of these respondents marked a distance of more than 25 m), those able to move a minimum of 25 m in the water (and swimming less than three styles), and non-swimmers (including those who, even if they declared the ability to move in the water, could not swim one full length of the pool in continuous form).

This division, adopted for the purposes of further analysis, showed that good swimmers (the first of the separated groups) were significantly more likely to declare their desire to participate with their child in swimming classes for infants. Therefore, it can be assumed that good swimmers high level of familiarity with water minimizes their fear of this environment, and consequently also of taking their child to the pool, which is further manifested by a greater desire to introduce their child to the water world already in the first year of his or her life.

Each of the 26 respondents who, when asked how often they go to the swimming pool, answered that they do it at least once a week, also declared their willingness to participate in infant swimming classes with their child. Interestingly, six (6) of them had never heard of this form of activity before, and yet they approved it. This shows that their own involvement in swimming has a significant impact on their child's attitude towards swimming from an early age.

The parents' knowledge about infant physical activity in water was determined on the basis of the declaration of level of knowledge on six topics proposed in the questionnaire. These were: readiness of the child for the first visit to the pool,, contraindications to taking the child to the pool, ways to adequately prepare the child for the first visit to the pool, techniques for supporting the infant in the water and suggestions for exercises and games with the child in the pool. In the last of the questions, respondents determined the level of knowledge of first aid for infants. The respondents declared the lowest level of knowledge on the question related to what to do/how to practice with a child in water. A detailed analysis of the results showed that

women who declared a low level of knowledge or lack of knowledge in more than 4 questions were significantly more likely to indicate that they would be afraid to take their child to the pool. However, this did not directly affect their attitudes towards participating with their child in such activities. The survey showed that pregnant women and mothers of infants most often get their knowledge from friends and family members (93.6%). The internet, forums and social networking sites (82%) and textbooks, handbooks and magazines in this field (80.4%) also ranked almost equally high. For the other respondents (50.8%), the valuable source of knowledge was a midwife, gynecologist and primary care physician. Less frequently, this information was obtained from the birth school (40.8%), television programs or Internet channels (33.2%) and less frequently from specialized workshops and trainings (9.6%). Unfortunately, only 58% of the respondents indicated that they had come across issues related to the early adaptation of the child to the aquatic environment in the abovementioned sources. This begs the question: if the topic of infant swimming were better disseminated through social media and professional literature, would this have an impact on parents' attitudes towards this form of spending time with their child and thus supporting their child's all-round development?

With the answer to this question, comes an analysis of the impact of drawing parents' attention to the issue in question, by completing the questionnaire of this survey, on their attitudes towards infant swimming. It turns out that after taking part in the survey, as many as 86.4% of all respondents are more likely or even more willing to introduce their child to the world of water. This demonstrates the relevance of promoting this topic to pregnant women and mothers of infants, especially as only 32 of the 250 women surveyed said they were not interested in the topic and as many as 73.6% indicated that they would be happy to learn more. Arousing curiosity in future and current parents of infants, as well as showing them the possibility of using physical activity in the aquatic environment to support the comprehensive development of the child in the first year of his life, was the indirect goal of this study, which, as can be seen from the analysis of the two previous questions, was achieved to a satisfactory extent.

Conclusion

1. Those willing to use the swimming pool more often declare their desire to participate with their child in physical activities in the water, and better swimming parents (minimum 3 styles) declare a greater desire to take their baby to the pool.
2. A parent's contact with the water environment in early childhood (before the age of 3) has a positive impact on the parent's attitude towards infant swimming at the level of a statistical tendency.
3. Access to swimming pools and the prevalence of swimming lessons has increased in recent years, as evidenced by the fact that people under 35 years of age are significantly more able to swim.
4. Mothers declaring a low level of knowledge of infant water activity issues are afraid to go to the pool with their infants, but this does not affect their attitudes towards their children's water activity.

Acknowledgements

The authors would like to thank all participants of the research.

References

[1] Kaczmarek M, Wolański N. *Rozwój biologiczny człowieka: od poczęcia do śmierci*. Warszawa: Wydawnictwo Naukowe PWN; 2018.

[2] Harwas-Napierała B, Trempała J, eds. *Psychologia rozwoju człowieka*. [Vol. 2] *Charakterystyka okresów życia człowieka*. Warszawa: Wydawnictwo Naukowe PWN; 2009.

[3] Szopa J, Mleczko E, Żak S. *Podstawy antropomotoryki*. Warszawa: Wydawnictwo Naukowe PWN; 1996.

[4] Osiński W. *Antropomotoryka*. Poznań: Wydawnictwo Akademii Wychowania Fizycznego; 2003.

[5] Diem L. Early motor stimulation and personal development: A study of four- to six-year-old German children. *J Phys Educ Recreat Dance*. 1982;53:23-25. DOI: 10.1080/07303084.1982.10629456.

[6] Kagan J. The form of early development: Continuity and discontinuity in emergent competences. *Arch Gen Psychiatry*. 1979;36(10):1047-1054. DOI: 10.1001/archpsyc.1979.01780100017001.

[7] Borkowska M, Szwiling Z. *Metoda NDT-Bobath: poradnik dla rodziców*. Warszawa: Wydawnictwo Lekarskie PZWL; 2012.

[8] Waller B, Ogonowska-Słodownik A, Vitor M, Rodionova K, Lambeck J, Heinonen A. Daly D. The effect of aquatic exercise on physical functioning in the older adult: A systemic review with meta-analysis. *Age Ageing*. 2016;45(5):593-601. DOI: 10.1093/ageing/afw102.

[9] Mooventhan A, Nivetitha L. Scientific evidence-based effects of hydrotherapy on various systems of a body. *N Am J Med Sci*. 2014;6(5):199-209. DOI: 10.4103/1947-2714.132935.

[10] Dias J, Manoel E, Dias R, Okazaki V. Pilot study on infant swimming classes and early motor development. *Percept Mot Skills*. 2013;117(3):950-955. DOI: 10.2466/10.25.PMS.117x30z2.

[11] Borioni F, Biino V, Tinagli V, Pesce C. Effects of baby swimming on motor and cognitive development: A pilot trial. *Percept Mot Skills*. 2022;129(4):977-1000. DOI: 10.1177/00315125221090203.

[12] Plimpton C. Effects of water and land in early experience programs on the motor development and movement comfortableness of infants aged 6 to 18 MO. *Percept Mot Skills*. 1986;62(3):719-728. DOI: 10.2466/pms.1986.62.3.719.

[13] Pietrusik K. Edukacyjne aspekty nauczania pływania dzieci w wieku niemowlęcym. *Aktywność Ruchowa Ludzi w Różnym Wieku*. 2007;11:64-71.

[14] Goldberg G, Lightner E, Morgan W, Kemberling S. Infantile water intoxication after a swimming lesson. *Pediatrics*. 1982;70(4):599-600.

[15] Bennett H, Wagner T, Fields A. Acute hyponatremia and seizures in an infant after a swimming lesson. *Pediatrics*. 1983;72(1):125-127.

[16] [U.S.] Department of Health and Human Services, Centers for Disease Control and Prevention (CDC) Protracted outbreaks of cryptosporidiosis associated with swimming pool use – Ohio and Nebraska. *JAMA*. 2001;285(23):2967-2969.

[17] Sylviane A, Dumont C, Nickmilder M. Infant swimming practice, pulmonary epithelium integrity, and the risk of allergic and respiratory diseases later in childhood. *Pediatrics*. 2007;119(6):1095-1103. DOI: 10.1542/peds.2006-3333.

[18] Nystad W, Njå N, Magnus P, Nafstad P. Baby swimming increases the risk of recurrent respiratory tract infections and otitis media. *Acta Pediatr*. 2003;92(8):905-909. DOI: 10.1080/08035250310003587.

[19] World Health Organization. *Global Report on Drowning: Preventing a Leading Killer*. Geneva: World Health Organization; 2014.

[20] Akademia Bobasa. www.akademiabobasa.org. Accessed May 25, 2023.

[21] Murray J. *Infaquatics: Teaching Kids to Swim*. West Point, NY: Leisure Press; 1980.

[22] Newman V. *Teaching an Infant to Swim*. New York, NY: Harcourt Brace Jovanovich; 1967.

[23] Prudden B. *Your Baby Can Swim*. Stockbridge, MA: Aquarian Press; 1979.

[24] Timmermans C. *How to Teach Your Baby to Swim*. New York, NY: Stein & Day; 1975.

[25] Hong Nguyen B. Swimming lessons for infants and toddlers. *Paediatr Child Health*. 2003;8(2):113-119. DOI: 10.1093/pch/8.2.113.

[26] Prudden B. *How to Keep Your Child Fit from Birth to Six*. New York: Harper & Row; 1964.

[27] Blystad J, van der Meer A. Longitudinal study of infants receiving extra motor stimulation, full-term control infants, and infants born preterm: High-density EEG analyses of cortical activity in response to visual motion. *Dev Psychobiol*. 2022;64(5):e22276. DOI: 10.1002/dev.22276.

[28] Araujo LB de, Mélo TR, Israel VL. Improvements in babies' neuropsychomotor development after family-centered Kids Intervention Therapy – Aquatic Environment (KITE): Biopsychosocial approach. *Early Child Dev Care*. 2023;193(1):33-45. DOI: 10.1080/03004430.2022.2048828.

[29] Kaca M. Uwarunkowania, motywy i opinie o uczestnictwie dzieci we wczesnej adaptacji do środowiska wodnego. *Aktywność Ruchowa Ludzi w Różnym Wieku*. 2007;1(11):30-37.

[30] Sobczak K, Antosiak-Cyrak K, Apolinarska J, et al. Profil motywacyjny rodziców kierujących dzieci w wieku niemowlęcym na naukę pływania [= Profile of motivation of parents sending infant s for swimming classes]. *Aktywność Ruchowa Ludzi w Różnym Wieku*. 2016;4(32):119-128.