

Knowledge about the effects of physical activity on quality of life in elementary schools

ARTIGO

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Summary

The aim of the research was to construct and validate a preliminary knowledge test on the effects of physical activity on quality of life for 9th grade students. This is a descriptive and exploratory study. A knowledge test with 12 multiple-choice items was constructed. Physical education teachers from primary and secondary schools assessed the content of the items using a content assessment protocol. A pre-test was carried out with 10 students from the same level of education in order to qualitatively assess the items. Initially, the test contained 12 items, four of which were discarded because they did not reach the appropriate discrimination index. Validation of this instrument needs to be carried out on larger samples for construct validity and thus to collaborate scientifically in other research. The test can be used by teachers as a learning assessment tool.

Keywords: Physical activity. Health. Knowledge. Elementary School.

Conhecimentos sobre os efeitos da atividade física na qualidade de vida no ensino secundário

Abstrato

A pesquisa teve como objetivo elaborar e validar o conteúdo de um teste de conhecimentos sobre os efeitos da atividade física na qualidade de vida para alunos do 9º ano do ensino fundamental. Trata-se de um estudo descritivo e exploratório. Elaborámos um teste de conhecimentos com 12 itens de escolha múltipla. Professores de Educação Física do Ensino Básico e Superior realizaram a avaliação de conteúdo dos itens a partir de um protocolo de avaliação de conteúdo. Realizámos um pré-teste com 10 alunos do mesmo nível de ensino para avaliação qualitativa dos itens. Inicialmente, o teste continha 12 itens que descartámos por não atingirem a taxa de discriminação. Esta validação precisa ser aprimorada em amostras maiores para validade de construto e assim colaborar cientificamente em outras pesquisas. O teste pode ser utilizado como instrumento de avaliação pedagógica.

Palavras-chave: Atividade física. Saúde. Conhecimentos. Ensino Básico.

1 Introduction

Given the negative consequences of physical inactivity on young people's quality of life, the aim of this research was to design and carry out a preliminary validation of a knowledge test on the effects of physical activity and quality of life for 9th grade students.

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This test is intended to help Physical Education teachers train and prepare students, helping them to acquire new healthy habits. By assessing students' knowledge of this specific subject, it is possible to identify gaps in students' learning and areas that need more attention in PE and health. With the development of a valid and reliable instrument, teachers will be able to use it as a tool to assess students' knowledge of physical activity and health.

The Brazilian population has low levels of physical activity, as evidenced by some studies (KNUTH et al., 2011; SILVA et al., 2021). This situation is especially worrying among adolescents, who tend to adopt sedentary habits such as prolonged use of electronic devices and media consumption (HALLAL et al., 2010). In the context of elementary school, students are easily distracted and have access to various sources of information such as television, radio, magazines and frequent use of the internet (BRASIL, 2018).

Young people have shown lower levels of physical activity and physical fitness, and are also less interested in participating in and assimilating information related to physical activities (FONSECA et al., 2020). In addition, children also have low levels of physical activity, due to the increase in means of transportation and the strong influence of sedentary activities in their daily lives (FERREIRA; SEDORKO, 2021).

According to the Ministry of Health, 26.8% of the Brazilian population over the age of 20 are considered obese and 6.7% of adolescents also suffer from this condition. The World Health Organization (WHO) predicts an increase in the number of cases of obesity worldwide, with an estimated 700 million people diagnosed by 2025. This is worrying because obesity is the second leading risk factor for coronavirus infection (BRASIL, 2021).

Based on this scenario, the importance of practicing physical activity for the general population is clear. This regular practice has a number of benefits, including helping to combat obesity, improving mental health and strengthening immune function. In addition, physical activity can prepare individuals to face pandemic scenarios such as Covid-19 (PITANGA; BECK; PITANGA, 2020). The benefits of physical activity can vary from person to person, so it depends on how each person relates to the activity and the effects obtained (SABA, 2011).

Just having knowledge about the benefits of physical activity does not automatically guarantee the adoption of more active behaviors. Knowledge and behavior are different spheres and it is necessary for the individual to translate this knowledge into concrete actions in their life (KNUTH et al., 2009; SILVA, 2022).

Quality of life is an individual perception that involves a combination of individual and socio-environmental factors, and the level of physical activity plays an important role in this equation (NAHAS, 2017). It is essential that physical activities are incorporated as healthy habits in the lives of children and adolescents, and the school, especially through the subject of Physical Education, plays a central role in this process (SILVEIRA; SILVA, 2011). Physical education professionals have a responsibility to disseminate knowledge about health, considering the growth in obesity and diseases related to a sedentary lifestyle (FERREIRA; SEDORKO, 2021).

Physical education offers opportunities to broaden students' experiences in basic education, enriching their motor repertoire and providing a wide cultural universe (BRASIL, 2018). It is important that teachers contextualize the benefits of physical activity, taking into account the social context of each student, so that they understand the real effects that physical activity or inactivity can have on health. Over the years, scientific research has demonstrated the potential of physical activity to improve health, including the prevention and treatment of diseases (KNUTH et al., 2009; FONSECA et al., 2020).

The existence of assessment tools in the field of Physical Education is still limited, which makes it difficult for teachers to monitor learning (SANTOS et al., 2022). The availability of these assessment tools would contribute more effectively to the education of

young people, allowing the school to monitor the development of the student in their training.

2 Methodology

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This research was submitted to and approved by the Ethics Committee of the Federal Institute of Education, Science and Technology of Ceará, under protocol number CAAE: 15895819.8.0000.5589. The study was divided into three stages: 1) Preparation of the instrument; 2) Content validation by specialists; 3) Pre-testing of the instrument on the target audience.

In the first stage, a review of the literature related to the effects of physical activity on quality of life was carried out in order to provide a basis for the items in the instrument. Based on this review, 12 multiple-choice items were created with four alternatives each, only one of which was correct. The items follow a structure that includes a base text, a statement and the items themselves, with a template and four distractors. The items and their base references are described in Table 2.

In the second stage, experts validated the content. Six teachers were invited to take part in the research. Of these, three are primary school PE teachers, one with a master's degree in health and the other with a master's degree in education. The other three are higher education teachers on a degree course in Physical Education and teach subjects related to health. These teachers have a doctorate and/or a master's degree in the area.

The teachers were asked to analyze the content of the items using a Content Validation Protocol. In this instrument, teachers were able to assess the clarity (yes or no) and relevance of each item to the intended objective, using a scale of 1 to 4, where 1 was considered not very relevant and 4 very relevant. Teachers were also allowed to suggest changes to the items.

The Content Validation Index (CVI) proposed by Alexandre and Colucci (2011) was used to analyze the items. This index is calculated as the ratio between the number of

teachers who selected 3 or 4 on the relevance scale and the total number of teacher responses. An item with CVI ≥ 0.80 is considered adequate, indicating a rate of agreement between the evaluators.

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$$IVC = \frac{n^{\circ}deconcordância}{n^{\circ}totalderespostas} \geq 0,80$$

The items considered suitable according to this criterion were corrected based on the evaluators' indications. Changes were made to the wording, the order in which the questions were presented, the reorganization of the alternatives and the basic texts.

In the third stage, the instruments were pre-tested on the target audience, which consisted of 10 9th grade students from a municipal public school in the state of Ceará. These students were invited to take part in the research, but they had to be regularly enrolled in Physical Education. Of the participants, 8 were boys and 2 were girls, aged between 13 and 16 years old

At a time and place provided by the school, a meeting was held with the students, in which the objectives and procedures of the research were explained. After this initial stage, the students answered the questions individually. The estimated time taken to administer the test was approximately twenty to thirty minutes

At the end, a collective discussion was held with the students, in which they expressed possible problems found in the questions, such as unknown words, incomprehensible wording and lack of understanding of the alternatives, among others. All the students' suggestions were taken into account by the researchers in order to improve the structure and writing of the items.

Based on the students' answers to the items, they were corrected and dichotomized into right and wrong, with a score of 0 and 1, respectively. The metric quality of the items was analyzed using the ease and discrimination indices. Ease is determined by the percentage of correct answers, and discrimination can be calculated by the point-

biserial correlation index. It is desirable for the difficulty of the items to be around 0.50. As for the discrimination index, items with indices above 0.20 are considered good.

3 Results and Discussion

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After analysis, it was found that all 12 items were considered clear by 4 or more teachers. Based on the suggestions provided by the evaluators, changes were made to all the items. Table 1 shows the number of teachers who indicated clarity and relevance for each item, as well as the CVI corresponding to each item.

Table 1. Item validation matrix.

Items	I Clarity	Concordance	IVC
Item 1	6	6	1
Item 2	6	6	1
Item 3	5	6	1
Item 4	5	6	1
Item 5	5	5	0,83
Item 6	6	6	1
Item 7	4	6	1
Item 8	5	6	1
Item 9	5	6	1
Item 10	4	6	1
Item 11	6	6	1
Item 12	5	6	1

Source: Prepared by the author

Based on the table above, we can see that the majority of teachers consider the items to be clear. As for agreement, of the 12 items assessed, all the teachers ($n = 6$) indicated agreement with 11 items, with the exception of item 5, where 5 teachers identified agreement. All the items also obtained a CVI ≥ 0.80 , indicating high agreement between the evaluators, in line with the proposal by Alexandre and Colucci (2011).

The data shows that no item scored below 4 in the evaluators' analysis, which indicates that the items were well evaluated by them in terms of clarity and agreement. The CVI also followed this logic, indicating high agreement.

Table 2 shows the items approved in the content validation process by the evaluators. The test items were modified with grammatical changes for better understanding by the survey's target audience, as well as reformulations of some items taking into account suggestions for improving the questions.

Table 2. Items evaluated.

Questions	Template	Reference
1) Simple activities such as dusting a house, running to catch a bus or even going for a walk increase our energy expenditure beyond resting levels. Does this concept apply?	C	Caspersen, Kenneth e Christenson (1985)
2) What concept is used to represent the activities recommended to improve the quality of life described in the text?	A	Caspersen, Kenneth e Christenson (1985)
3) Regular physical activity has beneficial effects against degenerative diseases such as coronary heart disease, hypertension and diabetes in older adults, as well as reducing the risk of developing them in normal individuals. Which chronic diseases are related to a sedentary lifestyle?	C	Filho, Jesus e Araújo (2019)
4) The text points to health as an important factor in quality of life. One of the main elements of health is physical activity. Therefore, it is considered that physical activity is very important for quality of life	B	Saba (2008)
5) Based on the text, mark the alternative that corresponds to the aspects of quality of life presented below:	B	Saba (2008)
6) Quality of life is related to various factors in a person's life: health, relationships with friends, sense of well-being, financial situation, job satisfaction, etc. Physical activity can contribute greatly to some of these factors. Which of the following are NOT directly related to physical activity?	D	Araújo e Araújo (2000)
7) Which of the following statements are correct about	D	Araújo e Araújo (2000)

quality of life?

8) A young girl, in search of a "perfect body", exercises exhaustively for at least two hours a day and most days of the week. However, she is feeling more tired and unwell for her leisure activities with family and friends. This is probably because	B	Petry et al. (2010)
9) While the practice of physical activity on the commute to work is more frequent among people with a lower level of education.	E	Knuth et al. (2008)
10) Based on the information presented, what can hinder the quality of life of rural workers in the northeast?	A	Araújo e Araújo (2000)
11) According to the text, many northeasterners who work in the countryside have excellent levels of physical activity, but do not have good levels of quality of life.	B	Araújo e Araújo (2000)
12) The text makes a connection between physical activity, health and quality of life. Based on the information, it is possible to conclude that	C	Araújo e Araújo (2000)

Source: Prepared by the author

During the pre-test, a group of 10 students answered the questionnaire. They were then interviewed and asked questions related to the questionnaire, focusing on their understanding of each item, the level of difficulty in relation to the alternatives and whether the students were able to differentiate the correct alternative from the incorrect ones. The pre-test was a fundamental phase of the research, in which the target audience comes into contact with the items, allowing the researcher to analyze whether the items can be interpreted correctly by the participants (WINDEL FET et al., 2005). Table 3 shows the ease index and discrimination index of the items.

Table 3. Index of ease and discrimination in items.

Item	Ease index		Discrimination index	
1	0,60	Médio	0,53	Discriminative
2	0,30	Difícil	0,06	Non-discriminatory
3	0,60	Médio	0,25	Discriminative

4	0,90	Fácil	0,27	Discriminative
5	0,40	Médio	0,72	Discriminative
6	0,70	Médio	0,39	Discriminative
7	0,70	Médio	0,09	Non-discriminative
8	0,70	Médio	0,09	Non-discriminative
9	0,40	Médio	0,31	Discriminative
10	0,40	Médio	0,44	Discriminative
11	0,30	Difícil	0,36	Discriminative
12	0,20	Difícil	-0,41	Non-discriminative

Source: Prepared by the author

Based on the ease index, which is calculated from the percentage of correct answers to each item, we can see that of the 12 items, eight were considered to be of medium difficulty (items 1, 3, 5, 6, 7, 8, 9 and 10), three items were classified as high difficulty (items 2, 11 and 12) and one item was considered easy (item 4) by the target audience during the pre-test.

The discrimination index measures the ability of an item to differentiate between lower ability and higher ability students. According to the data presented, four items (2, 7, 8 and 12) had a discrimination index below 0.20, indicating a limited ability to differentiate between lower and higher ability students. On the other hand, eight items (1, 3, 4, 5, 6, 9, 10 and 11) had a discrimination index above 0.20, suggesting a better ability to distinguish between lower and higher ability students.

It is important to note that the discrimination index analyzes the quality of a given item (VILARINHO, 2015), in the sense that it indicates whether the students who know the most about the content are more likely to get it right. When the discrimination index is negative, it means that lower ability students have a greater chance of getting the item right than higher ability students. This would show a problem in the construction of the item.

The interviews showed that the students had some difficulty reading the texts and interpreting the content of some items. In addition, there were reports of indecision

regarding the clarity of the questions and the understanding of terms associated with physical activity, which resulted in difficulty in differentiating which alternative was correct. Of the 10 students assessed in the test, 5 obtained a score of 50% or more in relation to the 12 items assessed. This indicates that half of the students managed to answer half of the test items correctly.

It is important to emphasize that measurement instruments, such as the one proposed in this study, provide tools that show indicators and assign numerical values to abstract concepts that can be observed and measured, helping to improve health praxis (COLUCCI; ALEXANDRE; MILANI, 2015). In the specific case of this study, this instrument can help Physical Education teachers in their pedagogical practice in relation to content on physical activity and health.

Validated instruments for assessing knowledge in certain areas are very important. In the study by Roncada et al. (2015), it was found that there are 22 questionnaires available to assess the level of knowledge about asthma. However, most of these instruments do not have full psychometric validation for the research.

In the research carried out by Leite et al. (2018), an instrument for validating educational content in health was developed and validated and identified good reliability. This tool could contribute to the development of educational content by researchers and professionals in the field of education and health. These findings reinforce the importance of collaboration between researchers and specialized professionals during the instrument validation process in order to avoid confusing results or biased measures that lead to erroneous conclusions (LEITE et al., 2018).

In the area of Physical Education, a study was carried out with the aim of validating items for the cognitive assessment of the content of popular games and games aimed at the 9th grade of elementary school (SANTOS et al., 2022). To carry out this validation, a group of judges was formed to evaluate the items and good evidence of content validity was identified.

Another similar study was carried out with the aim of developing and validating items to assess elementary school students' knowledge of the effects of physical activity

on the body (SILVA et al., 2019). As a result of this study, content and item validation was obtained, resulting in an instrument containing 24 items. Although there are some studies like this in the field of Physical Education, there are still few validated instruments to assess knowledge of this content.

Assessing students' knowledge at this level of education is essential for the Physical Education teacher, as students do not seem to attach any importance to practicing regular physical activity, so they may not be aware of the benefits of physical activity or may not fully understand them, not enjoying the benefits linked to this practice (SANTOS; MARTINS; MARQUES, 2014).

When assessing students' knowledge of certain content, the cut-off point of at least 70% correct is often used as a criterion to determine whether a piece of knowledge is considered satisfactory or not. This criterion is also adopted by many schools as a requirement for immediate approval in subjects (BARROS; SILVA, 2013). In the study by Silveira and Silva (2011), which assessed schoolchildren's knowledge of physical activity and its association with socioeconomic, demographic, behavioral, nutritional and health factors, a questionnaire was administered to 1,233 adolescents. With a total score ranging from 0 to 22 points, the participants obtained an average of 14 points, which corresponds to 63% correct. According to the researchers, this average score was considered low in relation to the knowledge assessed. In another study, students found it difficult to differentiate between concepts related to physical activity, physical exercise and physical fitness (BARROS; SILVA, 2013). This indicates a gap in the students' understanding of these concepts.

These results are worrying, as the lack of clarity in differentiating these terms can affect students' broader understanding of the importance of physical activity for health. It is essential that students have a proper understanding of the different concepts related to physical activity so that they can make informed decisions about their own health and well-being.

Combined with students' lack of knowledge on this subject, the health benefits of physical activity are still little discussed at school. This highlights the need to include more

comprehensive discussions and information about the benefits of physical activity in schools in order to promote a better understanding of these aspects among students.

The instrument used in this research could be an important tool for elementary school physical education teachers, since this content is currently relevant to developing students' understanding of the benefits that physical activity provides.

After the pre-test, the instrument was validated with eight items that address knowledge of the effects of physical activity on quality of life. Therefore, the test proved to be effective as a tool for teachers to use in pedagogical planning, allowing them to identify students' knowledge of the benefits that physical activity provides.

4 Final considerations

The aim of this research was to design and carry out a preliminary validation of a knowledge test on the effects of physical activity and quality of life for 9th grade students. In the end, we obtained a knowledge test with eight multiple-choice items with good preliminary validity indicators. This instrument can provide a meaningful insight into students' knowledge of the topic covered in the test. With this instrument, teachers can assess their Physical Education students' knowledge of the content on the effects of physical activity on quality of life.

However, it is important to emphasize that the validation of this instrument still needs to be carried out on larger samples to verify construct validity. We believe that this instrument could contribute to other research aimed at assessing the knowledge of 9th grade students about physical activity and quality of life. In future research, students' knowledge of this subject could be related to other variables such as sociodemographic characteristics. It could also be used to assess students' knowledge after an intervention program involving the subject.

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