QUALITY OF LIFE AND BODY MASS INDEX IN ELDER WOMEN THROUGH EDUCATIVE AND SPORT ACTIVITIES: THROWS
WHAT IS THE WALK/RUN FIELD TEST MORE VALID FOR ESTIMATING CARDIORESPIRATORY FITNESS?
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RESUMEN
Los deportes y juegos de lanzamientos pueden utilizarse como un contenido favorecedor de diferentes capacidades físicas, diversos parámetros corporales y por consiguiente, una mejora de la calidad de vida. La muestra del presente estudio se compone de 43 participantes del programa de Actividad Física para Mayores de la Diputación Provincial de Málaga, con edades comprendidas entre los 60 y 79 años (66.4±5.3), y que pertenecen a tres pequeñas poblaciones de la comarca de la Sierra de las Nieves (Málaga). Las participantes fueron medidas y pesadas, para posteriormente calcular el IMC. Además, se utilizó el cuestionario SF-36 sobre calidad de vida relacionada con la salud (Alonso et al., 1995). Los resultados obtenidos muestran diversas correlaciones inversas entre el índice de masa corporal y algunas dimensiones del cuestionario SF-36 sobre la calidad de vida relacionada con la salud.

PALABRAS CLAVE: envejecimiento, ejercicio físico, composición corporal, calidad de vida.

ABSTRACT
Sports and throw related games can be used as a main content to improve physical fitness, diverse body parameters and therefore a better quality of life. The sample of the present paper includes 43 female participants of the program of Physical Activities for the Elderly of the Diputación Provincial de Málaga, aged 60-79 years old (66.4±5.3), who are natives of three small populations of the Sierra de las Nieves (Málaga). The participants were measured in weight and height to calculate the body mass index BMI. In addition, questionnaire SF-36 was used to measure the quality of life related to health (Alonso et al., 1995). The results of the present study show inverse correlations between body mass index and some dimensions of the SF-36 questionnaire.

KEYWORDS: ageing, physical exercise, body composition, quality of life.

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1. INTRODUCTION

Ageing is a continuous process, in which a person plays a leading role during a slow period of time, without noticing the changes in all its magnitude\(^1\). Besides, the ageing process has a considerable impact in the body composition, in the functional capacity and the quality of life related to the health of adults and seniors\(^2\).

The continuous growth of the senior population has become a fact in the group of developed countries\(^3\), due to the reduction of the birth rate, the increase of the life expectancy, the economic situation that make people cautious to have children, more medications that relief the negative effects of several diseases, etc.

A remarkable issue is the importance of keeping healthy life styles all along the lifetime, avoiding or reducing the risks of chronic, cardiovascular and neurological disorders when ageing. Therefore, this fact can have a positive influence in an adequate quality of life and a higher life expectancy\(^4\).

In regard to body composition, and specifically the body mass index (BMI), it is one of the causes of chronic diseases in the elderly\(^5\). During the ageing process, the people experience a reduction of the muscle mass and an increase of the fat and other metabolic changes\(^6\). All of these are useful markers in the health of the elderly and are related to their quality of life. The daily wellbeing of the senior population needs to be acknowledged to act facing possible psychological and physiological problems that might appear with the age.


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Therefore, it is necessary to highlight the role of physical exercise in the ageing process, favoring a higher quality of life during the adult and senior stage of people’s life.

The activities included in physical exercise sessions for the elderly should be varied and with a motivating value. Sports and throwing games use many materials due to their variety and they favor social relations and interactions. Throwing also links a person with the surrounding context, implying a cognitive process, it improves the eye-hand-touch coordination and the own motor skills\(^7\).

When tackling the material related to throwing games and sports in the elderly, some criteria should be taken into account such as the adaptability at the time to select them and their characteristics: size, weight, shape and danger, etc\(^8\). Finally, the complexity of the throwing exercises with seniors should be according to the physical characteristics of the participants, favoring as “useful time” as possible and not to get tired of the practice.

The present paper intends to tackle the relation between the BMI and the quality of life related to the health of elder women that practice continuous physical exercise, specifically throwing sports.

2. METHOD

The present study is focused on a research with descriptive and correlation design of the BMI and the quality of life related to the health of elder women.

Participants

There were evaluated 43 women aged 60-77 years old (66.4±5.3), participants of the physical-sport activity program for seniors of the Diputación Provincial de Málaga, carried out in municipalities and regions of the province of Malaga.

\(^7\) CONDE, J. L., & VICIANA, V. Fundamentos para el desarrollo de la motricidad en edades tempranas. Aljibe: Málaga, 1997.
The three municipalities are geographically located in the Sierra de las Nieves (northeast of the province of Málaga).

**Instruments**

To evaluate the variables of the body composition and specially the BMI was calculated the weight (kg) and the height (cm) with a scale with an incorporated Seca stadiometer 714 model (range 60-200 cm). The BMI was calculated using the Quetelet index; BMI = mass (kg)/height (m²).

The SF-36 questionnaire in its Spanish version⁹ has been used to study the mental and physical component of the participants, also applicable to patients and the population in general. This instrument is made up by 36 items for a four week standard period, and they include the nine health scales/dimensions more frequently used in the main health questionnaires. Each scale is classified between the ranks 0-100, where 0 indicates the worst health condition and 100 the best possible health.

The nine dimensions are physical function, physical role, body pain, general health, vitality, social function, emotional role, mental health and health evolution. That instrument holds a physical component (physical function, physical role, body pain and general health) and a mental component (vitality, social function, emotional role and mental health).

**Procedure**

The participants did not exercise regularly or at a high intensity, they attended physical fitness lessons two times a week. The main contents comprised strength, resistance and flexibility/balance through exercises that included the throw of rigid and flexible objects. Likewise, its shape and weight could change. To set an example, at the time to exercise strength, there were used medicinal balls; for resistance and agility were used rubber balls of different sizes, even fit balls. In the case of flexibility were used rubber balls of different sizes. The organization of the participants was different depending on the content to work with; the exercises were mainly executed in pairs and groups but also individually. The educative component has been present in all the sessions since it

was explained to the participants the function of each activity, the effects on the organism and the importance of physical exercise to favor healthy habits.

The interview to obtain the results of the present paper was presented in a typical month such as January, August or December, so as any other factor could emotionally or affectively affect the future outcome of the research.

The strategy used at the time to apply the questionnaires was made through direct contact with the women of the sample, clarifying possible doubts and explaining each of the tests and questionnaires. All the participants of the study were informed about the confidentiality of the information and a proof of that is the consent sheet willingly signed by them.

The participants of the present paper were chosen out of those who regularly attended the physical fitness lessons, fulfilling the requirement of being over 60 years, since that is the minimum age required to participate in the program. The rest of the requirements were not having physical or psychological disorders that would affect health neither eat or smoke at least one hour before the tests.

**Statistical analysis**

The Kolmogorov–Smirnov test was used to determine the normality of the data. The variables studied have presented an abnormal distribution. It was calculated the mean and the typical deviation of variables age (years), weight (kg), height (cm), body mass index (BMI) (Kg/m²) and quality of life related to health (SF-36) of the participants. The association of the BMI with the eight dimensions of the SF-36 was analyzed through the Spearman’s rank correlation coefficient. The correlation values were interpreted as: weak or no relation ($r = 0$ a 0.25), the fair degree (0.25 a 0.50) and from moderate to good ($r = 0.50$ a 0.75)$^{10}$.

All the statistical analysis was made with the statistical package for Social Sciences (SPSS, v.17.0 for Windows, SPSS Inc., Chicago, IL, EE.UU.).

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3. RESULTS

The variables related to body composition have an average BMI value of $31.2 \pm 4.7$ kg/m$^2$, a weight of $72.3 \pm 12.1$ kg and an average height of $1.52 \pm 0.1$. In regard to quality of life related to health (SF-36), the eight dimensions present an average value of $74.1 \pm 21.2$ for the physical function and $70.9 \pm 35.3$ in the physical role dimension. In regard to body pain, the average value is $65.3 \pm 23.6$ and the general health value of $61.8 \pm 20.3$.

The vitality presents one of the lowest average values with $59.7 \pm 20.6$ and $82.5 \pm 19.2$ for the social function. Also, the mental component is related to the social role, with an average of $78.3 \pm 34.1$. The last is mental health with an average value of $67.5 \pm 19.6$ (Table 1).

<table>
<thead>
<tr>
<th>SF-36</th>
<th>Mean (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Function</td>
<td>74.1 (21.2)</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Physical Role</td>
<td>70.9 (35.3)</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Body Pain</td>
<td>65.3 (23.6)</td>
<td>22</td>
<td>100</td>
</tr>
<tr>
<td>General Health</td>
<td>61.8 (20.6)</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Vitality</td>
<td>59.7 (20.6)</td>
<td>0</td>
<td>95</td>
</tr>
<tr>
<td>Social Function</td>
<td>82.5 (19.2)</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td>Emotional Role</td>
<td>78.3 (34.1)</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Mental Health</td>
<td>67.5 (19.6)</td>
<td>24</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 shows the correlations established among the eight dimensions of the SF-36 with the BMI, causing a significant correlation among the MBI with general health, vitality (both $p<0.05$), physical function, physical role, emotional role, mental health ($p<0.01$, all) but not with the dimensions of body pain and social function.

<table>
<thead>
<tr>
<th>BMI</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Function</td>
<td>-.348**</td>
<td>.002</td>
</tr>
<tr>
<td>Physical Role</td>
<td>-.321**</td>
<td>.006</td>
</tr>
<tr>
<td>Body Pain</td>
<td>-.154</td>
<td>.162</td>
</tr>
<tr>
<td>General Health</td>
<td>-.254*</td>
<td>.019</td>
</tr>
<tr>
<td>Vitality</td>
<td>-.239*</td>
<td>.029</td>
</tr>
</tbody>
</table>
4. DISCUSSION

In regard to the relation established among the BMI and different scales of the SF-36 questionnaire, some aspects can be noted. Specifically with the scales of physical function, physical role, emotional roles and mental health is established a high association, and lower level with general health and vitality.

In the case of the level of social interaction and health, some studies carried out in Japanese women show the importance of social communication along with the ideal body weight as main causes to determine a good quality of life\(^\text{11}\). The question is how to interpret the term “ideal weight”, since the participants of the present paper shows a high BMI but also good psychological and social factors. This might refer to the fact that they are pleased with their respective weights and therefore get into a dangerous dynamic for their health. The results of the dimension of the physical function\(^\text{12}\), the physical role, general health and social function have shown a worsening in further studies\(^\text{13}\) as the person ages. Except for the social function, the rest of the SF-36 is inversely significant to the present paper. People with high BMI levels have worst mobility and physical aspects\(^\text{14,15}\) considerable problems with functional and social activities\(^\text{16}\). The treatment of obesity in adult and senior people is complicated due to the physiological features of the ageing process and the lack of interest of the elderly for health in general.

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Studies on post-menopausal and pre-menopausal women showed how the former present more difficulties than the latter to modify their body composition\textsuperscript{17} and that could have repercussion in how the participants interpret quality and style of life. However, it is important to add that the BMI is not the reflection of the general body composition of a person, even less of seniors.

It could be used as a general indicator for the control of the body weight in the health area\textsuperscript{18} but it could become an error since there are other useful variables such as fat free mass or muscle mass. Physiological changes such as the BMI appear during the ageing process and this fact can affect the quality of life of the elderly\textsuperscript{19}. The functionality degree can also be affected by a high BMI and worse values of quality of life.

As final conclusion, the average BMI value of the population studied is related to different type of health status of the participants, which directly affect their quality of life. Several limitations should be mentioned. The selection of the sample has not being random or representative of the geographic location. It would be interesting to carry out future studies with a sample of male population and analyzing other body variables and psycho-social factors in senior population.

REFERENCES


\textsuperscript{18} SHEPHARD, R.J. Envejecimiento y Ejercicio. 	extit{Publice Standard}. 2004, 3, 56.


