Perspective on health and backcare in adolescents practicing rhythmic gymnastics and classical dance: a qualitative investigation of multiple cases

Perspectiva sobre la salud y los cuidados de la espalda en adolescentes practicantes de gimnasia rítmica y danza clásica: una investigación cualitativa de casos múltiples

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Abstract

The main objective of this work was to explore the perceptions of high school students and teachers involved in the performing arts (rhythmic gymnastics and classical dance) concerning the health and care of the back. Three adolescents and a high school teacher participated, responding openly to questions through a semi-structured interview. The results showed that the four participants had some episodes of back pain, and three of them experienced LBP throughout their lives, and their perception of this is predominantly negative. They explained that the activity practiced required the development of exercises with continuous trunk extensions and rotations, as well as extreme movements, and awkward and disharmonious postures. The workouts require a high level of demand and the hours of training are very long. In conclusion, participants in performance arts, such as competitive rhythmic gymnastics and professional classical dance, perceive that they require high levels of dedication, which in turn requires extreme mobilization of the spine that could have repercussions on back problems. And for these reasons, they believe that a professional person, specialized in sports or dance, is required to direct this type of activity to avoid back health problems.

Keywords: physical education, back health, perception, survey, qualitative.

Resumen

El objetivo principal de este trabajo fue explorar las percepciones de estudiantes de secundaria y profesoras practicantes de actividades escénicas (gimnasia rítmica y danza clásica) sobre la salud y el cuidado de la espalda. Participaron tres adolescentes y una profesora de secundaria, las cuales respondieron de forma abierta a preguntas a través de una entrevista semiestructurada. Los resultados mostraron que las cuatro participantes tuvieron algún episodio de dolor de espalda y tres de ellas DLI a lo largo de sus vidas y su percepción sobre este es predominantemente negativo. Explicaron que la actividad practicada requería el desarrollo de ejercicios con continuas extensiones y rotaciones de tronco, así como buscar movimientos extremos, posturas viciosas y disarmónicas. Los entrenamientos requieren un alto nivel de exigencia y las horas de entrenamientos son muy elevadas. En conclusión, las participantes en actividades escénicas como la gimnasia rítmica competitiva y la danza clásica profesional perciben que requieren una alta dedicación, que dichas actividades a su vez requieren una extrema movilización de la columna vertebral que podría repercutir en problemas de la espalda. Y que por esas razones creen que se requiere a una persona profesional de la especialidad deportiva o danza para dirigir este tipo de actividades para evitar problemas de salud de la espalda.

Palabras clave: educación física, salud de la espalda, percepción, encuesta, cualitativa.

Introduction

Back pain affects all ages, all peoples, in all geographical areas (James et al., 2018). This study, despite the fact that information was collected on back pain (pain in the lower back, dorsal and cervical areas), focuses on the most common back pain, that is, non-specific low back pain (LBP) whose causes remain uncertain and probably unspecific (Buchbinder et al., 2020).

Etymologically, the term low back pain derives from the Latin "lumbus", "loin, lumbar area", and the Greek "algia", "pain", meaning "pain (myalgia or neuralgia) in the loins or in the lumbar region" (Gabaudan, 2011). Nonspecific low back pain is defined as pain located between the lower limit of the ribs and the lower limit of the buttocks, and its intensity depends on posture and physical activity. It is also usually accompanied by painful limitations of movement and may be associated with referred or radiating pain (Kovacs et al., 2006). In the past, LBP was attributed to underlying diseases (Cardon & Balague, 2004), as well as alterations in the statics or dynamics of the spine, such as spondylosis, spondylolisthesis or scoliosis, or disc or facet lesions, such as disc or facet degeneration. However, these things are observed just as frequently among healthy people as among subjects with pain (Latorre et al., 2008). For this reason, LBP is currently specified as all pain located in the reference area, and it is implied that it is not attributable to known specific pathologies, such as infections, tumours, osteoporosis, fractures, structural deformations, inflammatory disorders, etc. et al., 2012).

This type of symptom is also observed in adolescents due to different modifiable factors such as sedentary activities, the level of physical activity, the loads carried daily and psychosocial factors, among others (Calvo-Muñoz et al., 2018; Trevelyan & Legg, 2006). All these risk indicators mean that the prevalence in this group of the population is very high (Minghelli, 2020) ranging between 7 and 72% according to some authors (Jeffries et al., 2007).

As mentioned, the level of physical activity is considered one of the many risk factors for back pain (Franz et al., 2017) and specifically, the practice of competitive sports, such as rhythmic gymnastics (Kruse & Lemmen, 2009) or activities such as classical dance (McMeeken et al., 2002).

The Royal Spanish Federation of Gymnastics describes seven specialties: artistic, rhythmic, trampoline, aerobic, acrobatic, gymnastics for all and parkour. Three of these (artistic, rhythmic and trampoline) are Olympic sports. Rhythmic gymnastics includes ballet and modern dance set to music while performing complex techniques with hoops, balls, clubs, ribbons or ropes. Scores for each exercise involve a series of motor skills and physical capabilities based on a combination of jumps, balances, turns and flexibility (d'Hemecourt & Luke, 2012). For its part, ballet, or classical dance, is a form of physical activity in which repetitive and extreme movements are performed that apply force especially to the lower limbs and spine. It is characterized by complete control of the body and each of its parts (Vidal-Rubio & da Cuña-Carrera, 2016). These two activities constitute the group of physical-sport activities which are those most practiced by adolescents and women in Spain (Martin et al., 2009).

Gymnastics routines are complex, with repetitive directional movements that put pressure on the spine (d'Hemecourt & Luke, 2012). Gymnastics requires extreme flexion and extension of the spine, as well as jumping and lifting loads that increase back pain (Sweeney et al., 2019). Specifically, repeated hyperextension and rotational forces predispose gymnasts to spondylolysis or spondylolisthesis (Kruse & Lemmen, 2009). For these reasons, gymnasts may be at increased risk of low back injuries due to the excessive forces applied to the spine during some of the movements in the sport (Purcell & Micheli, 2009).

Classical dance requires repetitive mechanical stress on physiological structures, such as stretching exercises that promote extreme ranges of motion. Very complicated coordinated movements are also practiced which, carried out at high speed, could affect parts of the body that are sensitive to the aging process of young people, altering the morphology of ligaments and vertebrae during growth. These repetitive stresses can also affect the systems controlling the development of spinal curvatures (Moller & Masharawi, 2011). Among the most relevant positions that can influence the appearance of back pain, we highlight those in which lumbar extensions appears arabesques and cambres combined with dehors. Dancers can also suffer from other ailments, such as neck pain (including headaches) and back pain (Lozano et al., 2008).

As Andújar and Santonja (1996) explain, there are differences between correct posture and poor posture.

> Correct posture is anyone that does not overload the spine or any other element of the musculoskeletal system» and poor posture «that posture which overloads the bones, tendons, muscular, vascular structures, etc., permanently wearing down the body, in one or more of its elements, especially affecting the spine.

Based on these arguments, the following research questions were raised: how have the participants bodies reacted vis-a-vis the practice of rhythmic gymnastics and classical dance? What role has back pain played in their lives as athletes, and in their lives as high school students? How have they managed LBP if they have experienced it? And what role has Physical Education, as a school subject, played in their way of seeing sport and its relationship their bodies?

Taking this problem into account, it is interesting to be able to use a qualitative study methodology in which information can be collected and delved into to get a better understanding of the perspective that adolescents, who practice sports activities at a competitive level, have on health and back care. Their perception and experience can be used to prevent future undesirable situations in the practice of these activities. For the design and elaboration of more specific educational interventions on health and back care in the school context, it will be of great help to have personal testimonies from athletes. For these reasons, the main objective of this study was to explore the perceptions that secondary school students, who participate in the performing arts (rhythmic gymnastics and classical dance), have regarding health and back care.

Methodology

Paradigm

The work carried out corresponds to a type of interpretive paradigm, based mainly on qualitative research, understood as "any type of research that produces results that have not been reached by statistical procedures or other types of quantification" (Paz, 2003).

We understand that for the objective presented here, the qualitative perspective is the most appropriate because subjective and intersubjective reality can be approached as legitimate objects of scientific knowledge, although it has already been stated that there is no single way, position

or orientation when carrying out qualitative research (Flick, 2015).

Type of study design

For the development of this work, a cross-sectional, multiple case study design was applied. According to Crowe et al. (2011) the multiple case study approach allows for in-depth, multifaceted explorations of complex problems in their real-life setting.

This type of design was selected because it is appropriate when existing knowledge about the phenomenon is limited (Yin, 2009).

On the other hand, multiple cases are conceived as a more robust and reliable methodological strategy in terms of research than the use of only one case (Mohajan, 2018), because this allows the gathering of empirical evidence and allows the researcher to analyse each case individually, as well as several cases (Gustafson, 2017). This strategy is used to study the differences and similarities between the cases, to predict similar results or predict opposing results (Yin, 2009). For these reasons, we have opted for more than one case and multiple units of analysis (students and teachers).

Multiple case studies can be intrinsic or instrumental. The intrinsic ones refer to learning about a particular case, while the instrumental ones are those in which you have a research question and you need to obtain a general understanding, or you want to have an idea of a problem (Buchanan & Jones, 2010). This study aims to gain a general understanding of back health and care in adolescent rhythmic gymnasts and classical dancers through the use of a series of instrumental case studies.

Participants

The sample (n = 4) was made up of 3 students from a Secondary Education Institute (IES) and an English teacher from the same institute, with the aim of obtaining several points of view. The 3 students were the same age (16 years old). meaning they were in their 1st year of high school, and the participation of the teacher was included because her interview was focused on experiences, perceptions and feelings generated during her adolescence; the teacher was 30 years old at the time of the interview.

The participants in the research were selected by the Physical Education teacher from the IES through a non-probabilistic convenience sampling process to allow a homogeneous sample.

All the participants came from the same geographical area (the city of Valencia). In addition, they had all been involved in rhythmic gymnastics or classical dance since childhood (beginning between the ages of 4 and 8) and had experienced some episodes of back pain and LBP throughout their sports career. Two had done rhythmic gymnastics and the other two participants were classical dancers.

It should be noted that, in order to maintain the anonymity of the 4 people interviewed in this study a code was assigned to each of them, based on the order in which the interviews were conducted: E1 (Interviewee number 1, classical dance), E2 (Interviewee number 2, artistic gymnastics), E3 (Interviewee number 3, classical dance) and E4 (Interviewee number 4, rhythmic gymnastics).

Ethical statement

All the people interviewed participated voluntarily in the study. The centres, the class tutors and the parents were informed in writing about the study and gave their consent. The study was also accepted by the Experimental Research Ethics Committee of the University of Valencia, registration number H1509086047576.

Data Collection

The data was collected electronically through semi-structured interviews during February and March 2021: 2 students on February 15, 1 student on February 16 and the teacher on March 3rd. Each meeting lasted approximately 60 minutes and was subsequently transcribed in order to carry out the pertinent qualitative analysis in a reliable and objective manner. At the beginning of the collection of testimonies, the objectives of the investigation and the commitment concerning confidentiality of the data collected were explained to the interviewees, and permission was requested to record the interviews in order to analyse their content a posteriori.

In relation to back pain or back problems, and especially concerning LBP, these were defined as prevalence throughout life (pain reported from the beginning of their lives until the day of the interview). Although it was proposed to talk about back problems for any region of the spine (lower back, dorsal area or cervical area), the objective of the researchers was to focus on LBP. As explained in the introduction, LBP is the most common and prevalent symptom in the adolescent population.

The value of qualitative data does not depend on the number of people interviewed, but rather on the ability of the researcher to understand a small number of people with particular characteristics (Fontana & James, 2005). In this study, three researchers participated in carrying out the interview: two professors and researchers with more than 10 years' experience who are specialists in the subject, and a postgraduate student with training in research methodology.

Interviews are the most common technique in qualitative research (Silverman, 2019). In these interviews, the aim is to understand the perspectives of the participants, based on their experience, allowing the interviewee to speak freely, without directing their points of view, thus adjusting to the objectives of exploratory and inductive research (Seidman, 2006).

Interviews can be classified as structured, semi-structured or unstructured (Stucky, 2013). Each type of interview has a different purpose. Structured interviews are related to more quantitative studies, since it is intended that the interviewee responds only to closed questions. Unstructured ones allow more in-depth studies and are especially directed towards fundamental research. Semi-structured interviews are the ones most used in qualitative research, and especially in the use of case studies, in order to take advantages of the two previous types. Thus, it is possible to follow a general structure and at the same time allow the possibility of being able to improvise and get away from the script to investigate and help the interviewee to provide better answers (Myers, 2019). This type of interview tries to gather as much information as possible from the participants, but following guidelines that focus on a specific investigation.

The fact of having a structure is due to the need to provide an answer to the research questions formulated. The creation of the script to carry out a semi-structured interview allows the researcher, on the one hand, to guide the interview itself, focusing on the essentials of the study and, on the other hand, it gives the respondents the freedom to respond more broadly to the questions.

The application of qualitative research techniques has been considered opportune because, in general terms,

they provide satisfactory results when studying complex phenomena (Fernandez & Quintero, 2013).

In this way, the semi-structured interviews with the four participants followed the categories and guiding questions shown in Table 1.

With this interview guide, the intention was to maintain an order that could vary depending on the evolution of the conversation. Some concrete and specific questions were formulated to promote a dynamic and fluid meeting. On the other hand, it was considered convenient to formulate an extensive and complementary number of items per category to offer the researchers options to choose the most appropriate items in case some questions did not manage to extract sufficient information from the participants. Thus, when disinterest, ignorance or simply no arguments were detected, new questions were formulated to recover motivation. During the course of the interview, the expert and moderator made sure they showed interest in the answers given and actively listened to the interviewees in order to create a comfortable, friendly atmosphere.

Analysis

As this is a qualitative study based on in-depth interviews, the analysis has been carried out based on the recommendations of García, Gil and Rodríguez (1994). The analysis process was as follows:

1. Separation of units with their own meaning by means of grammatical criteria (for example, a sentence).
2. Data reduction
    a) Categorization: categories and subcategories were established for all those units of meaning that had their own characteristics
    b) Coding: each category was assigned a code in order to make it more visual.
    c) Synthesis and grouping: all meaning units were grouped into the corresponding categories/ subcategories.
3. Development of a conceptual scheme where the meta-categories, categories, subcategories are grouped.
4. Obtaining results: since the data is textual and not numerical, comparison and contextualization have been carried out to obtain results.
5. Process to obtain conclusions.

Table 1. Semistructured interview guide

Categories	Guiding questions
Greeting and explanation of the reason for the study	Report on voluntary participation and record informed consent. Do not start directly with the questions, but first try to create a good relaxed atmosphere.
Introduction	1. What sports do you participate in or did you participate in (artistic gymnastics / rhythmic gymnastics / Dance /etc.)? 2. How many years have you been involved in this discipline, or how many years did you participate in it? 3. Can you briefly tell us about the routine of a person who participates in your discipline?
Lifestyle	1. How is your school day and workload throughout the day? 2. Do you spend many hours sitting at work/in class? And at home? 3. Do you do any type of sport/physical activity in your free time? 4. How many hours do you spend doing sport/physical activity a week? 5. What is your diet throughout the week? 6. How many hours a day do you watch television (TV)/use the computer/mobile?
Back pain: LBP	1. Have you ever suffered from back pain and especially LBP? 2. Since when did you notice LBP? 3. Could you explain what that pain is like? 4. During all the time you have been in pain, has its intensity varied? 5. At what time of day does it hurt the most? 6. What kinds of daily activities bother you the most? 7. Does the sport you practice or practiced cause you or do you think it influenced the LBP?
Feelings generated towards pain	1. How do you feel when you experience LBP? 2. How does this pain affect your academic performance? 3. Do you feel unable to perform daily-life tasks for this reason? 4. Have you started any kind of therapy? (OTHERWISE)→Why do you think it has/has not worked? (Therapies you have done) 5. Do you think there may be other solutions? 6. Do you see yourself in the future/long term with the same limitations caused by pain? Why? 7. How do you think your back problem affects your well-being and the quality of your life today?
Knowledge about back health	1. What degree of back health do you consider you have and why? (Question related to the perception of pain)→What is your perception of your health in general? What about your back specifically? 2. Where did you learn to take care of yourself? Through what methods / therapies? 3. Do you think that well-focused physical activity can be a tool to reduce pain? 4. Has your perception of sport changed due to low back pain? How did you see AF before? And now? (before DLI) 5. Have you worried about "health" before your problems? 6. Do you think you now know more about how to take care of your back? How do you take care of your back today and how has the treatment you evolved?
Sports practice and free time	1. What extracurricular activity/sport do you practice/did you practice in your free time? 2. How do you think this pain affects your sports/music practice? 3. Has it helped you get to know yourself better?
Future perspectives	1. Do you think that your current situation has conditioned and will condition your current and future life? How and why? 2. Have your back problems changed your view of the health potential of activity and physical exercise?

Source: Own elaboration

Results

After analysing all the information provided through the interviews, the following categories were established:

1. Types of workouts.
2. Contributions of sports practice.
3. Daily routines or habits.
4. First episodes of LBP.
5. Causes of LBP.
6. Knowledge about health and back care.
7. Perceptions and feelings when experiencing LBP.
8. Possible solutions to LBP.
9. General health perception.
10. Future perspectives related to LBP.
11. Recommendations to better manage LPB.

Category 1: Types of training.

This category was based on general aspects, related to the day-to-day training of athletes. It subcategorizes, on the one hand, initiating training and, on the other hand, training routines.

Regarding initiating training in their specialty, all the answers indicated that initiation began in stages prior to adolescence: “I started when I was 8-9 years old” (E2); “I started ballet at the age of 4 and continued until I was 21” (E4); “I started at 4 and a half years old, but professionally at 9” (E3).

In the subcategory related to training routines, we found comments in which they described their day-to-day training "The training sessions were almost always the same, beginning with a warm-up, then working on flexibility and finishing with dance" (E2), while others comments analyse the time spent on the modality "he spent more than 15 hours a week" (E4).

Category 2: Contributions of sports practice

In relation to everything that sport or expressive activity has given them, various comments were given. These have

been subcategorized into: contributions at the physical, emotional, values and time levels.

The contributions on a physical level were given by 3 of the 4 students, in comments such as "On a physical level I feel muscular and toned for other things" (E1) or "On a physical level, I guess, being in shape, being active".

The emotional variable appeared in the comments of 2 of the 4 students: "When you don't get something, frustration." (E1); "On an emotional level, when it comes to dancing, I am another person and I express my feelings in any way" (E3).

The subcategory related to values and effort appeared in some comments such as "Above all values as a person, companionship, responsibility, maturity, management of emotions (nerves, frustration, etc.)" (E2); "I usually get what I want. If you work at it, in the end you get it" (E1).

Only one person interviewed considered that time is one of the contributions of ballet: "I always have time for everything. It was one of the things that classical dance gave me" (E4).

Category 3: Daily routines or habits

The category of routines was related to everything that they consider important in their day-to-day life, regardless or not of gymnastics/dance. Therefore, it has been subcategorized into lifestyle and food.

Regarding lifestyle, all the comments, except one, mentioned the lack of time, overwork or lack of sleep: "It takes a lot of effort (the school day). I am used to it because I have been doing it since I was 8 years old" (E1); "I am very busy: I get up, go to class, eat, rest or do homework, go training (all afternoon) and I continue studying" (E2); "I only have (hours of sleep), unfortunately" (E3). Only one student responded from a positive point of view "No (it does not burden me much), because it is something that I like. For me it is not an obligation. It is a way to clear my mind" (E3).

Food is another point where somewhat similar comments were observed. Three of the people interviewed admitted that they had a balanced diet and even a follow-up by an expert in nutrition: "I don't control it as such (food), I don't pay attention to calories because at home I eat a balanced diet" (E1); "Some seasons restricted us a bit (not eating chocolate and things like that). Even so, at home we eat quite a balanced diet" (E2); "Currently, I go to a nutritionist to control my diet and to know the amounts of macronutrients, fruit, vegetables that I should eat" (E3). The teacher interviewed admits that "At that time I didn't eat very well, I ate sweet things. Mothers didn't see this to be as important as they do now" (E4).

Category 4: First episodes of LBP

This category was related, on the one hand, to the lifetime prevalence of LBP. Of the four participants, three (E2, E3 and E4) stated that they had suffered from LBP. For his part, E1 stated that he had only experienced discomfort in the cervical area.

In relation to the date (understood as age) when the pain began, with the initial symptoms, the three female students (E2, E3 and E4) coincided with the onset of pain, more specifically in early adolescence: "Around 1st/2nd ESO" (E1), "It all started at 12 years old" (E2), "5 years ago (that is, at 11 years old)" (E3).

Of the four people interviewed, only one stated that LBP has persisted to the present day and that he/she continues to suffer from it: "Not at the same level as before, but yes. When I sleep badly, or make some effort, I do notice it" (E3). The rest of the participants (E1, E2 and E4) stated that they do not currently have symptoms of back pain, or LBP, and even expressed these perceptions in the past.

The symptoms (duration, intensity, etc.) were explained by the three participants with LBP: "At first, I thought it was soreness, I didn't know what it was. It was something that lasted a couple of days and then it went away" (E2); "I learned to live with low back pain, which I suffered from continuously, although sometimes I noticed it more than others, depending on the intensity of the training sessions" (E3); "The first time I stopped dancing it started to get more serious. But the headaches and neck pain started a little earlier, especially when I reduced the hours of training" (E4).

Category 5: Causes of LBP

The four people interviewed highlighted 5 key aspects that they considered could be related to the LBP: lack of strength, the activity performed, the execution of the movement, stress, or the teacher/coach.

The cause related to the lack of strength was described by a student and the teacher: "As I was exerting myself and my muscles were not "worked" it happened more" (E1), "When I stopped doing ballet (before not because my muscles were strong) my body began to change, causing a pinched nerve and I had a disk problem" (E4).

Two students considered that rhythmic gymnastics/dance (in general) was the trigger for these discomforts: "(I put it down) Sometimes because of dance" (E1), "Obviously I think that it could be the cause (Gymnastics). Rhythmic gymnastics is a sport that seeks extremes, awkward postures and pushing yourself to the limit" (E2).

The execution of some specific movement within the internal logic of dance/gymnastics was another of the key points at the beginning of LBP: "By curving the back (cambré), lumbar extension. Or, if not, the same, but moving the pelvis forward" (E1), "When raising my leg, I needed to rotate it from the hip and not from the knee. When I did this, my knee was inwards (valgus) and my lower back hurt" (E3).

Only one student blames it on stress: "I am also a person who, when stressed a lot, notices that all the discomfort goes to my back, because of my body posture" (I2).

Finally, the influence of the teacher, or coach, is important; according to the teacher interviewed, to prevent LBP: "If you don't have a good teacher, since it is a discipline that handles the body a lot, and if you don't know anatomy, you can end up with many injuries" (E4).

Category 6: Knowledge about health and back care

This category was related to the knowledge that the 4 people interviewed have acquired from the beginning of back pain to the present. Among the knowledge acquired we find muscles, emotions, physical abilities and technique.

The first subcategory was related to the musculature involved. Three of the four people interviewed considered that the muscles are very important to prevent injuries, and how excessive training can have a negative impact on back health: "At least I try to prepare my muscles. I do my back exercises to keep myself straight" (E3), "in rhythmic gymnastics the muscles that stabilize are more extended, they lose that stiffness" (E2).

One of the students commented that she learned to relate the level of pain with her emotions: "I have learned why that pain comes to me: if I am stressed, because of my posture, etc." (E2).

As for the subcategory related to physical abilities, flexibility was one of the aspects which they highlighted, and from which they learned in their career as athletes: "Because with stretching the pain goes away" (E1), "But I also have that flexibility that I think is important" (E3).

Lastly, E4 gave great importance to the technique and execution of the movement and in the interview, she mentioned the knowledge she acquired regarding exercises that can be counterproductive for the back: "there are certain movements that are dangerous. The basic stance can become very forced. It asks you to retrovert your hips and lift your neck, eliminating the two natural curves of the spine".

Category 7: Perceptions and feelings when experiencing LBP

In this category, all the interventions by the interviewees in which they showed their feelings and perceptions towards LBP were grouped. Three of them (E2, E3 and E4) demonstrated predominantly negative and pessimistic feelings.

The first subcategory was related to disability, understood as the situation in which some activities are limited due to physical impediment: "It really is something (Low back pain) that prevents you from doing many things. The fact of sitting for a long time is really annoying. It's harder for you to concentrate" (E2), "It really hasn't been something that has limited me to a normal life, but I did have to give up paddle" (E2), "When I started the competitions, even knowing how to deal with those problems, I spent many hours studying, and there were days that I couldn't study because of headaches" (E4).

The second subcategory was related to the feeling of guilt: "I just thought I had done it wrong, because if I hurt myself, it is because I did that step, that movement wrong" (E1), "At first I never thought about it and I blamed ballet. I had simply done it wrong and had reached a point of no return" (E4).

Another of the subcategories that was analysed in the interviews was that related to frustration as a consequence of LBP: "Frustration was always there, since I could not give 100% of myself" (E4), "Any type of pain reduces your moral. As it caused a headache, it also changed my character: you don't want anyone to look at you, yell at you or talk to you" (E4).

Lastly, acceptance of pain was another subcategory that was seen in some interventions by the students and the teacher: "In the end, the body is very wise and ends up adapting to pain. As right now it is not something that prevents me from following my daily life activities" (E2), "Now it is something I have learned to live with: I need to stretch every day, postural hygiene. I go to the physio from time to time" (E4).

Category 8: Possible Solutions to LBP

This category was linked to all those comments in which possible solutions to back pain were provided: physiotherapist, stretching and mobility, technique, physical exercise and others.

All of them contributed proposals, although each one from a different approach. Two students considered that physiotherapy worked for them in the short term, more specifically manual therapy: "I have gone to physiotherapist very regularly. In itself, I noticed that massage was what worked best for me" (E2), "I had that problem, and I went to the physiotherapist and he solved it for me" (E3).

Stretching and mobility are another important subcategory that the students considered to play a part in the injury: "Because with stretching the pain goes away" (E1), "Stretching and exercises: little egg, Cat-camel, maintaining postures, etc. Especially mobility" (E2), "I think stretching is essential" (E4).

The correct technique for the exercises and even their modification was another key factor that some of the students commented on to solve pain: "I was looking for a solution, I asked how it is done or I adapted it to my body" (E1), "The teacher corrected my technique and the pain has gone." (E3).

Physical exercise was also considered fundamental for back health: "Yes, the physio recommended swimming" (E2), "I think that PE is essential. A professional told me to start going to the gym" (E4), "For me, gaining strength at the upper body level was a discovery" (E4).

Finally, two comments highlighted that the solution could lie in other therapies: "Yes, osteopathy has given me a lot of quality of life" (E4), "As it has been for so long. Apply heat, creams, stretching, sleeping postures" (E2).

Category 9: General health perception

Another category analysed in our study was the perception of general health that the interviewees had. Two students had a positive perception of their health: "I consider myself healthy" (E1), "Globally, I consider myself a healthy person. It is not something that limits my life" (E2). Only E4 considered that during her adolescence she had poor back health: "Terrible (Back health), I studied a lot" (E4).

Category 10: Future perspectives concerning LBP

Future perspectives were subcategorized into optimistic and pessimistic. A student approached her future from a positive point of view "If she had an injury, she would continue dancing" (E3). Another of the students, more specifically the one who suffered from low back pain for a longer period of time (E2), was somewhat more pessimistic: "I think it is going to be something that I am going to have, to a greater or lesser extent, depending on the time. It will be something that is there, but it is not going to limit me".

Category 11: Recommendations to better manage LBP

The final category was related to the advice that the interviewees would give to other colleagues to prevent or improve back-care health. This category was subdivided into external focus and internal focus.

There were two comments addressed to external focus: "Apart from looking for that solution, giving them advice, massaging them, stretching them" (E2), "Pay a lot of attention to people who know, exercises that they tell you" (E1). Comments aimed at the internal focus were mentioned by 2 of the people interviewed, but these were more extensive and detailed: "I would start listening to myself a little earlier. Also, that, when I felt pain not to force myself, he knew when it's time to stop" (E2), "1) Forcing does not mean stressing. 2) Moments of high performance must always be accompanied by knowing how to relax. 3) Take care of your body as if it were a temple" (E4).

Discussion

The aim of the present study was to gain a general understanding of back health and care in adolescent rhythmic gymnasts and classical dancers through the use of a series of instrumental case studies. Within back problems, this was specified in the lumbar region as this is most common and frequent among the population studied.

Prevalence of low back pain in adolescence

Although our study was not an epidemiological study, it should be noted that, of the four people interviewed, three of them suffered some episodes of non-specific low back pain, and one of them explained that he only suffered back pain, but at the cervical level. In addition, it should be noted that the onset of symptoms was around 11-12 years old, with the onset of adolescence, as described in the literature (Leboeuf-Yde & Kyvik, 1998). Therefore, most of the adolescents surveyed experienced back problems, coinciding with the data reflected in the literature regarding the prevalence of LBP among young people (Bento et al., 2020; James et al., 2018; Jeffries et al., 2007).

In relation to the duration of the pain, two of the three participants who reported experiencing LBP indicated that it was recurrent and intermittent. Conventionally, LBP is categorized, from the point of view of its duration, as acute (lasting less than 4 weeks), subacute (lasting between 4 and 12 weeks) and chronic (lasting more than 12 weeks) (Spitzer, Leblanc, & Dupuis, 1987).

Different epidemiological studies established a range of 7-27% of recurrent LBP in the school population (Burton et al., 1996; Harreby et al., 1999; Jones & Macfarlane, 2009; Jones et al., 2004; Vikat et al., 2000). These young people reported a lower quality of life, visited the doctor more frequently and took painkillers (Harreby et al., 1999), as did two of the participants in this study who currently still need a health professional to relieve pain in the lower back (E3 and E4). Furthermore, recurrent LBP during adolescence could be a precursor to chronic LBP in adulthood (Harreby et al., 1995; Salminen et al., 1999).

Back health and sports practice

In our study, four participants were selected who were currently involved in, or had been involved in, rhythmic gymnastics or performance arts, such as classical dance. One of the categories that we considered relevant in our study was the so-called “Causes of LBP”. During the course of the interviews, the participants confirmed that the level of demand and the hours of training were very high: E1 trained 4 days a week, E2 dedicated 12 hours of weekly training spread over 4 days, E3 currently dedicates 3 or 4 hours a day, and E4 trained more than 15 hours a week during adolescence. According to authors such as Kujala et al. (1992) and McMeeken et al. (2002), the fact of practicing an institutionalized sport and dedicating a high training load (understood as hours of practice) can be a risk factor that triggers episodes of low back pain.

Other risk factors that can be seen in our results, and which are in line with the contributions of other authors (Bento et al., 2020; Lynch, Kashikar-Zuck, Goldschneider, & Jones, 2006), are stress or hours a day in a sitting position. None of the people interviewed gave great importance to these factors; however, all of them spent many hours sitting down due to attending school. In addition, they admitted that they led a very busy lifestyle, with a heavy load of weekly activities and responsibilities due to their studies and hard training.

The perception that the four people interviewed had about the causes of low back pain was another of the categories analysed and was closely related to that of other authors. Among them we highlight, firstly, the continuous extensions and rotations of the trunk: all of them confirm, both in rhythmic gymnastics and in dance (although the latter to a lesser extent), that extreme and disharmonious postures are sought, which can have negative repercussions on back health (Cugusi et al., 2020; Hart et al., 2018; Henn et al., 2020; Paxinos et al., 2019; Solomon et al., 2017 ; Sweeney et al., 2019). However, one of the substantial differences between the two disciplines is jumps. Aldazabal (2010) affirms in his study that jumps with previous displacement, very common in rhythmic gymnastics, show a very high impact peak, which can increase the risk of injury for gymnasts. On the contrary, in classical dance the movements are more controlled and there are fewer jumps. In addition, the extensive experience and academic training of dance conservatory teachers provide the students, who must be examined in concepts related to biomechanics, anatomy, physiology, etc., with greater knowledge.

The lack of strength is another intrinsic factor which athletes highlighted as a cause of injuries and back problems, since this physical ability, according to them, is essential to avoid imbalances and hyperlaxity due to the excessive development of flexibility. Flexibility is developed differently in the federative and educational spheres. In the latter, there are fewer sessions, and forced and extreme exercises are not necessary (Ruiz & Minarro, 2020). On the other hand, they considered the role of the coach, or teacher, to avoid injury as crucial, since they are the people in charge of controlling the training loads and techniques. This was reflected in our work and is observed in other qualitative studies (Fawcett et al., 2020). Our results evidenced different perceptions regarding this subcategory: some athletes managed to get over their injury thanks to the instructions of the coach, while others confirmed that this same person had been the main cause of the symptoms.

One of the risk factors in the appearance of low back pain according to Fawcett et al. (2020) is sports equipment; the footwear or the type of flooring used during sporting activities . However, in our results this was not a factor mentioned by the people interviewed.

Future prospects and advice to other colleagues

Regarding the categories related to the perception of back health and future prospects, the students were very optimistic and considered that they were in good health in general. This can be very positive, since the fact of acquiring disruptive or negative behaviours, lack of confidence, worry or lack of control over pain is related to the appearance of low back pain (Lynch et al., 2006).

However, the students, throughout the interviews, stated that they would continue practicing their modality (dance or gymnastics) despite the fact that the injuries or back problems caused by their practice were maintained over time. The reasons they mentioned were: that they really liked the activity they practiced; that they had to live with the pain, or that said injury or symptom was not going to limit them. These contributions coincide with those of authors such as Cogusi et al. (2020), which affirm that the fact of continuing to practice a sport despite an injury or problem can increase its risk and magnitude.

The category related to "advice to other colleagues" are contributions made by the students and that answered the following question: What advice would you give to a training partner to prevent the pain that you are suffering right now? The students mentioned different strategies that were related to the contributions of different authors: the importance of having a good physical activity professional to lead the training sessions/classes (Fawcett et al., 2020) or control of emotions (Bento et al., 2020; Lynch et al., 2006).

Knowledge about back health and its care

Our results showed how knowledge about back health in the four people interviewed was probably somewhat higher than the general adolescent population, who show low levels in reference to these concepts (Monfort-Pañego et

al., 2016, Minana-Signes & Monfort-Panego, 2015; Miñana-Signes et al., 2019). This may be due to both the positive and negative experiences that the students have had regarding their back health throughout their sporting careers. The role of intervention programs in the educational field on back health can be fundamental, especially in the area of physical education, where, in addition to teaching theoretical knowledge, students must be able to put this into practice in their daily lives (Miñana-Signes et al., 2021). However, the results show how, at least in our work, the students and the teacher had not acquired this knowledge from their school, but rather had had to resort to advice from different health professionals to solve the problems. (Physiotherapists, doctors, osteopaths, etc.).

Main limitations

The main limitations have been linked to the search for qualitative scientific literature, since there is little research of this type, especially on back health and education. For this reason, the discussion section has had to resort to other types of studies, especially quantitative ones.

On the other hand, another limitation has been the absence of a control group (which does not show symptoms of back pain or LBP), since this would have allowed us to compare both groups in reference to lifestyles, knowledge about back health, perceptions or feelings.

The sample size was optimal for carrying out a study of multiple cases, but we consider that a greater number of samples could provide much more enriching data and thus draw a greater number of conclusions.

In relation to the questions about the feelings generated towards back pain, it should be noted that there was some complexity in that the participants could describe an adequate analysis of the causes of their back pain without the help of the interviewer. Due to this situation, the researchers thought it convenient not to delve into this variable and limit themselves to finding out if they had experienced any episodes of back pain and especially LBP.

Conclusion

As a main conclusion, it can be said that adolescents participating in performance arts, such as competitive rhythmic gymnastics and professional classical dance, perceive that they require a high level of dedication which can lead to excessive physical exercise. They experienced that these activities in turn require movements and high demands on the spine that could cause problems in this area. For this reason, they consider that the professional person in charge of directing these activities is a key agent to avoid future back health problems. In general, it is recognized that their level of knowledge about health and back care is high due to experience in pain management and consultations with health professionals during their careers as athletes.

As more specific conclusions we can say that:

1. The four participants experienced some episodes of back pain and three of them suffered LBP throughout their lives, caused, according to them, by participation in sporting activities (rhythmic gymnastics and dance).
2. The perception and feelings as a result of LBP were predominantly negative, among which we highlight frustration, incapacitation, guilt and acceptance.
3. They explained that the activity they are / were involved in required the development of exercises with continuous trunk extensions and rotations, as well as extreme movements and awkward postures.
4. In relation to the duration of the training, the participants stated that the level of demand and the hours of training were very high.
5. The experiences they have had throughout their lives in sports and their injuries have allowed them to learn concepts about health and back care independently, or with the help of different health professionals.
6. Linked to the previous conclusion, the interviews do not reflect that the students gained any knowledge about back health through the educational field. This fact must be taken into account by teachers, since all those students who are not involved in sports in their extracurricular day will not receive strategies and methods for the prevention of this common injury.

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