EVIDENCE, EXPERIENCE AND BELIEF. SCIENTIFIC RESEARCH VERSUS SOCIAL MEDIA

EVIDENCIA, EXPERIENCIA Y CREENCIA. INVESTIGACIÓN CIENTÍFICA VERSUS REDES SOCIALES

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Abstract

Scientific knowledge has developed thanks to the proliferation of scientific journals that publish research providing evidence. However, the information received by the population, especially adolescents, flows through other channels, such as social media. While rigorous research generates knowledge, the speed of social media favours the spread of incorrect information. In this ecosystem, influencers play a decisive role. Their communication skills and aesthetics often give them a perceived authority that sometimes lacks scientific basis. When it comes to physical exercise in fitness centers, and even more so in strength training using weights, the selection of information is a key skill. In order to distinguish between evidence and beliefs, it is necessary to work from a rigorous analysis of the information in order to provide recommendations that can be integrated into the educational curricula of the subject of Physical Education

Keywords: Physical exercise, adolescence, fitinfluencer, Physical Education.

Resumen

El conocimiento científico se ha desarrollado gracias a la proliferación de revistas científicas en las que se publican investigaciones que aportan evidencias. Sin embargo, la información que recibe la población, en especial los adolescentes, fluye por otras vías, como las redes sociales. Mientras la investigación rigurosa permite generar conocimiento, la rapidez de las redes sociales favorece la propagación de información incorrecta. En este ecosistema, los influencers juegan un rol determinante. Su capacidad de comunicación y estética suele otorgarles una autoridad percibida que, en ocasiones, carece de base científica. Cuando se trata de la práctica de ejercicio físico en centros de fitness, y más aún en el entrenamiento de la fuerza mediante el manejo de cargas, la selección de información es una competencia clave. Para discriminar entre evidencias y creencias, es preciso trabajar a partir de un análisis riguroso de la información, para aportar recomendaciones que puedan integrarse en los currículos educativos de la asignatura de Educación Física

Palabras clave: Ejercicio físico, adolescencia, fitinfluencer, Educación Física.

Science and the Dissemination of Scientific Knowledge

Science can be defined as a system of structured and verifiable knowledge that seeks to understand the natural and social world through a rigorous, evidence-based methodology. Its role in the development of society is fundamental, as it acts as the engine that transforms knowledge into social well-being, sustainable solutions and improved quality of life.

The social importance of science has evolved significantly since the mid-20th century, leading to a change in the approach to and development of scientific activity (Castro-Martínez et al., 2016). Scientific dissemination is understood as the transfer of scientific knowledge to society, both at a general level and to professionals in each field (Palao, 2015).

Scientific production is a necessity and a requirement for the advancement and improvement of society. It arises from systematic research, through rigorous analysis based on a specific and controlled design for the generation of knowledge. The usual end product of this process is an article to be published in a scientific journal that represents the synthesis of the entire procedure and its contribution to the area of knowledge (Olivera, 2012).

In the current context, there is a wide variety of scientific journals that publish works in the field of physical activity and sports sciences. Physical education professionals publish with the aim of increasing scientific knowledge and thus improving professional practice (Reverte-Masía et al., 2012). Publications in this field have grown significantly in quantity and quality in recent years. Overall, there is a wide and rigorous range of options for publishing research papers on different topics, which contribute to the plurality and versatility of disciplines and to the transdisciplinarity of the academic field (Olivera & Andrés, 2017).

For example, since its creation in 2004, the journal Cultura, Ciencia y Deporte (Culture, Science and Sport) has published more than 500 articles with the support of 1,200 external reviewers. Its thematic areas and fields of work in Physical Education and Sports cover health, education, performance, management and recreation. There are many journals that publish scientific articles by researchers from around the world on a regular basis.

Scientific Evidence

Scientific evidence can be defined as the set of information, data and evidence obtained through the rigorous application of the scientific method. This has evolved over the years. Different classifications establish levels of evidence based on research design. Some classify studies into five levels, from the highest level (level I) with studies based on randomised controlled trials, meta-analyses and systematic reviews, to retrospective studies (level III) or expert opinions or personal observations (level V). The publication of systematic reviews and meta-analyses has increased significantly in recent years (Paras et al., 2022). The latter is a statistical analysis of a set of results from original studies with the aim of integrating the findings. This procedure allows for results that are more generalisable than the conclusions of specific studies on a given topic (Paras et al., 2022).

Under the criteria of the Oxford Centre for Evidence-Based Medicine, the combination of a systematic review with meta-analysis of randomised controlled trials is ranked at level I evidence, the highest possible (Owen et al., 2024). More recently, the umbrella review has emerged, a type of scientific study that compiles and synthesises the results of multiple systematic reviews and meta-analyses on the same topic. All of this reflects the scientific community's concern with establishing how much evidence exists on certain issues. And although there is stronger evidence on some topics, while on others it is still being generated, it is necessary to know how much evidence we have when making certain claims.

In PubMed (the open-access search engine for the MEDLINE database), when searching for systematic reviews and meta-analyses containing the words "physical exercise" or "physical activity" in the title and/or keywords, only one document appears between 2000 and 2005; between 2006 and 2010, there are sixteen articles; between 2011 and 2015, there are 187; between 2016 and 2020, the number rises to 765; and finally, between 2021 and early March 2026, 1,886 documents appear. The quantitative evolution of this type of work is clearly evident. On the other hand, if we search for articles in which the words "umbrella review" appear in the title (and without specifying the search with any keyword), we have to wait until 2007 to find the first publication. From that moment until March 2026, a total of 2,945 reviews of this type are documented.

All of this provides evidence that there is a great deal of scientific information available. But how does the top of the pyramid reach its base? All this knowledge is useless if it does not reach society. Digitisation has made it more accessible (Ruiz-Corbella, 2018), although it is necessary to develop adequate skills for selecting and refining information. Accessing this information is not easy, and it requires professional s who are capable of converting all that scientific language into something more accessible and clear.

The Digital World and Adolescence

In the 21st century, widespread access to Information and Communication Technologies (ICT) has profoundly transformed the way people communicate, interact, entertain themselves and access information (Heredia et al., 2026). Digital media are omnipresent in the lives of most people, especially adolescents, offering countless opportunities to access information of all kinds. There is an inherent risk of finding inaccurate or biased information on the Internet, which increases the risk of adopting inappropriate behaviours (Aloi et al., 2025).

Evidence has shown that a small digital device has taken control of many people's lives. A study of adolescents in Seville aged between 12 and 18 shows intensive use of digital technologies with a high frequency of Internet, mobile phone and television use in both genders (Heredia et al., 2026). In a quantitative longitudinal descriptive study involving 64 students from all years of compulsory secondary education (ESO) and sixth form, Hernández and Rayón (2021) found that 95.50% had their own mobile phone. In the second year of ESO, there was an increase in the number of applications used and the amount of time spent on mobile phones.

In another study, Gómez, Nogueira-López et al. (2025) determined that the average age of access to the first smartphone was 11.7 years. In addition, their analysis showed that those who accessed the device earlier showed a more frequent and intensive pattern of network use. García-Jiménez et al. (2020) found that adolescents in Madrid acquired their own smartphone at the age of 11, which was also the age at which they accessed social media. All of them are "digital natives" as they have been in direct contact with technology since childhood (Pagador & Llamas, 2014).

The impact of social media on the lives of adolescents is a topic of public debate for various reasons. They spend a lot of time consuming multimedia content on social media and obtaining information from it (Aschwanden et al., 2024). In a recent literature review, Casanova-Garrigós et al. (2025) link excessive use of social media to a harmful influence on the development of adolescents' self-esteem and self-concept, which can distort their perception of their body image.

Feijoo et al. (2024) found that the platforms most used by adolescents are Instagram and TikTok, with 28.7% and 28.6% respectively. WhatsApp follows with 19% and YouTube reaches 14%. Platforms such as Facebook, Twitch, BeReal, Pinterest, Telegram, Snapchat and X (Twitter) show a preference of less than 2%. Only 3.7% indicated that they did not use any social media. García-Jiménez et al. (2020) state that adolescents mostly choose Instagram to carry out most of their social media activities.

For the consumption of audiovisual content, the social network TikTok has become the most used by adolescents. It focuses on getting users to interact within the platform with two elements: on the one hand, with a personalised algorithm that shows them videos based on their own interests and, on the other, with the content that the users themselves generate and upload to the platform (Virós-Martín et al., 2025).

But all these social networks are nothing more than a container in which the population consumes and/or produces content. There are people who share content with the aim of influencing the decisions, opinions or behaviour of an audience. They are known as influencers. The Royal Spanish Academy (RAE) defines this Anglicism as a person with the ability to influence others, mainly through social networks.

Social Media and Influencers

Social media hosts a wealth of information on any topic, such as sport, nutrition and body aesthetics. Although this is not inherently negative, it does pose certain problems. In particular, the accuracy of the information shared varies greatly, and it is almost impossible to offer personalised content. Although social media can serve as a valid source of information and contribute to promoting a healthy lifestyle (Gómez, Díaz-Campo et al., 2025), the ability to analyse and filter information is

required. One aspect to consider is whether the recipient is sufficiently prepared to interpret the information they receive, to discern whether it is appropriate or not, and if so, whether they are able to interpret and apply it correctly (Palao, 2015).

In a study on the role of influencers in relation to health information among Austrian young people aged between 15 and 25, Engel et al. (2026) found that 75.4% of this population followed an influencer, and of these, 37.2% followed someone whose focus was on health-related content, usually oriented towards nutrition, sport and fitness. Based on their analysis, they point to a lack of scientific criteria, as well as the interaction of commercial motivations among some influencers. For this reason, they propose the implementation of strict regulations to protect young people from certain messages.

In another study of sedentary young people of both genders between the ages of 14 and 20, each individual was assigned to follow an influencer on Instagram for a period of six weeks, with the aim of increasing their levels of physical activity. Interestingly, influencers who had no connection to the world of physical activity and sport (a singer, an event organiser and a football video game player) achieved higher activity rates than those influencers related to the world of sport (skiing and mountain biking) (Aschwanden et al., 2024).

Influencers are perceived as close friends whose opinions or recommendations are sincere and disinterested (López-Martínez et al., 2024). The impression a person makes is related to what is known as the "halo effect," a cognitive bias where a positive first impression (or outstanding trait) of a person, brand, or product unconsciously influences our overall assessment, leading us to assume other positive qualities without evidence (Fritsch et al., 2025). This generalised perception, based on a single attribute, conditions consumer interaction and trust without any evidence.

Studies by Yin et al. (2024) and Durau et al. (2022) on adults conclude that influencers who are perceived as physically attractive experts and who also generate trust attract more attention from users. Age also seems to influence this fact. Sixteen-year-olds are more likely to have a sports influencer than 20-year-olds, with gender not being a determining factor in this relationship (Gil et al., 2022).

Fitinfluencers

The phenomenon of influencers in the world of fitness, known as fitinfluencers, has gained great popularity on social media and has a significant impact on the decisions and lifestyles of young people. This is a profile that has proliferated exponentially on social media. Alongside the already established beauty and fashion influencers, this new trend has emerged, focusing on explaining to users the exercises they should do based on specific physical goals (muscle definition and/or development, localised fat reduction, etc.) (Fanjul & González, 2025).

In a study funded by the Research, Transfer and Innovation Institute of the International University of La Rioja, entitled "Between health and the cult of physical appearance. Impact of content published by fitinfluencers on adolescent body image" Feijoo et al. (2024) found that daily consumption of platforms such as Instagram, TikTok, YouTube, and Twitch, among others, has allowed fitinfluencers to exert a significant influence on the self-image and physical well-being of young people, one of the segments most susceptible to persuasive messages. This report reveals a marked divergence in young people's opinions about what constitutes a supposedly healthy and aesthetic ("beautiful") body today, where musculature, toning, and thinness prevail, and where fitinfluencers become models of significant influence on the body self-perception of young people.

Fanjul and González (2025), based on a questionnaire study of males between the ages of 17 and 24 (1,753 respondents) who frequently followed a fitinfluencer, report that 72% focus on their muscle development (and the exercises they do to achieve it).

In a specific analysis of the Instagram network, Khan & Chapa (2026) show that 28.6% of influencers' posts related to fitness include advice on healthy eating, focusing particularly on the consumption of certain supplements. Similarly, 71.4% of posts include some kind of recommendation on what physical exercise to do. Among Swiss gym users, Mettler et al. (2020) found a high prevalence of supplement consumption, fuelled by poor-quality information on how to consume them and the risks involved.

This is based on the fact that body image and physical appearance are social concerns during adolescence (Carrion et al., 2016), as standards of beauty and health are being shaped by a variety of influences projected by the media and the content of certain influencers (Feijoo et al., 2024).

For López-Miñarro (2025), the internet and social media have become a problem, as many adolescents, in their practice of fitness-related physical activities, are guided solely by the advice or recommendations of a YouTuber or influencer. These profiles include non-professionals with well-defined physiques who proclaim themselves to be "experts" and become prescribers of physical and nutritional routines that they explain to their followers (Fanjul and González, 2025). This brings us into the realm of beliefs and experiences.

The Royal Spanish Academy (RAE) defines experience as prolonged practice that provides knowledge or skill to do something. From a philosophical point of view, as De Hoyos (2020) explains, Aristotle defined science as the knowledge of the universal, demonstrable and valid, while experience was the knowledge of the particular, the circumstantial, for specific cases of a given reality. A particular experience does not generate science by itself, although it can pave the way for a hypothesis if it is complemented by the knowledge that exists on a given subject at that time.

An example of experience lies in the conclusion that mobile phones affect a person's running technique. This is an observational fact, contextualised in years of experience, based on the repetition of people with incorrect arm technique when running, due to the fact that they carry their mobile phone in one of their hands. To convert this experience into scientific knowledge, it is necessary to adopt an appropriate methodological design, with procedures that allow evidence to be generated. Although there are websites whose headlines proclaim that running with a mobile phone in your hand worsens your running technique, no specific studies have been found that have analysed this using the scientific method. There are studies on how certain variables affect running economy, but not in relation to carrying a smartphone while running. Experience can be a first step in the process of generating evidence, but not everything is possible in this way.

Belief, on the other hand, could be defined as the complete credit given to a fact as true. It is a concept far removed from evidence. Belief is a subjective truth, a conviction, something that a person considers to be true (Diez, 2017). Certain issues, such as the effective and safe execution of exercises, run the risk of being subject to belief, as experience cannot replace evidence. Professional supervision and adherence to evidence-based recommendations are key to optimising results (Vargas et al., 2025), but also to preventing problems arising from poor exercise prescription, both from a qualitative and quantitative point of view.

Fitness, Adolescence and Physical Exercise

According to the latest Survey of Sports Habits in Spain (2024/25), referring to the Spanish population as a whole, in the 15-24 age group, 83.3% of the sample practises some form of physical activity or sport, which represents a percentage increase compared to previous editions (2022 and 2020). The data show an increase in the number of people who report performing weight-bearing activities (bodybuilding and weightlifting), reaching 23.5% (more common among males than females: 29.5% vs 17.1%), which exceeds the 17% reported in the 2022 edition. When analysing this data by age, 34.2% of people aged 15-24 perform an activity of this type, above the 25-54 age group (26.9%) and those aged 55 and over (10.1%) (Ministerio de Cultura y Deporte, 2025).

The fitness sector in Spain is experiencing steady growth and is booming, relying on digitalisation and social media as a basis for sustaining its continued progress (Valcarce-Torrente et al., 2024). An analysis of young people's favourite activities indicates that fitness-based physical exercise is very popular, although males show a greater preference for strength training (Kudlacek et al., 2020). In public and private sports centers, younger people (aged 15-19) spend more time weight training. As they get older, this type of activity loses prominence in favour of functional activities such as CrossFit, suspension training, HIIT, etc. (Pérez Villalba et al., 2018).

Given the rise in the number of young people engaging in this type of physical activity, TikTok has taken on a more prominent role in this sector. The number of active profiles on this platform has increased significantly (Valcarce-Torrente et al., 2024). But it is not the only one. On YouTube, users also have access to visual information from influencers on how to perform certain physical activities (Durau et al., 2022).

In an analysis of information posted on Instagram by Brazilian influencers about physical exercise and health, Marocolo et al. (2021) found that only 2.7% of it had a scientific basis. In addition, a significant number of posts used a scientific reference that did not corroborate their claim. In a study conducted in Mexico with a sample of 125 adults (≥18 years old) who are active social media users, Lara et al. (2026) showed that most participants regularly consume fitness-related material. Their

findings highlight that social media is an environment with both benefits and limitations: it can promote exercise, but it does not guarantee its quality or safety. For this reason, the authors propose the integration of digital literacy criteria in health to optimise the responsible and safe use of this type of content. But where can we find the right information?

When accessing the Internet, we quickly find pages with short, eye-catching and powerful headlines, seeking to capture the public's attention:

- Nine fitness Instagrammers you really should follow!
- The best fitness influencers to follow in 2026
- Who are the 10 fitness influencers with the most followers?
- But what criteria are used to design these rankings? Is there a process with a research design based on objective quality elements?

In this regard, we can find an interesting proposal. Howard et al. (2024) published an article in the Journal of Sport Sciences, whose objective was to compile a list of the main creators of content on sports medicine on social network "X". The study was conducted to distinguish between verified, quality content and content that lacks these characteristics. Their results led to a classification of these creators based on various variables, including the h-index, which is a bibliometric indicator that measures the productivity (number of works) and impact (quality or visibility through citations) of a scientist. The results show that this index was 30.2 (95% CI = [24.8-35.6]) with a mean of 22.0 (range = 1-101). For the authors of the study, the relatively high h-index suggests that the influencers they analysed, related to Sports Science and Sports Medicine, make notable contributions to the scientific literature in their field of knowledge. It is probably necessary to go further down this path, making recommendations about who to follow. And that analysis must be based on scientific criteria. In Spain, there are scientific communicators from the world of fitness who base their recommendations on scientific evidence. But are these the people our teenagers follow on social media? Efforts should be made to ensure that these are their role models, and the educational context could participate in this process.

Musculoskeletal System and Weight Training

Experience and data indicate that a relatively significant percentage of teenagers engage in physical exercise with weights. This is positive, as scientific evidence supports the claim that physical activity is linked to positive effects on physical, psychological and social health, improving the well-being of the population (Kemel et al., 2022). However, in terms of musculoskeletal health, the selection of exercises in muscle strength training requires appropriate supervision by professionals to ensure the learning and execution of proper load handling techniques (Bonilla et al., 2022). Many years ago, Peiró and Devís (1992) argued that from a health perspective, it was necessary to consider not only the quantitative aspects of physical exercise, but also the more qualitative aspects, focusing this analysis on the execution of the exercises in order to select those that provide greater safety. Inadequate information based on beliefs, together with the absence of direct supervision by a trained professional, poses a risk to the musculoskeletal system. This becomes even more important when data show that the prevalence of back pain among children and adolescents has increased in recent years (Miñana-Signes et al., 2021). In adolescent athletes, the presence of low back pain is common, and the volume and intensity of the sporting activity performed are identified as risk factors (Wall et al., 2022).

In a retrospective study, Sugimoto et al. (2020) analysed injuries in people who practised CrossFit, according to their age (over and under 19 years old). Injuries were most frequently located in the spine, with a higher proportion in those under 19 years of age. Although the aetiology of the injuries is multifactorial, the available evidence identifies different risk factors: overuse, overly short recovery periods, inadequate physical conditioning, frequent use of high loads, and inadequate technique in certain exercises, among others (Bonilla et al., 2022).

The work of Veiga et al. (2026) on fitness trends in Spain concludes that the sector has a high proportion of professionals with university training in Physical Activity and Sports Sciences, which favours the use of evidence in the prescription of physical exercise. There is no doubt that adequate initial training also requires a process of continuous training to keep up to date with scientific advances. However, in a study on the technical execution of squat and bench press exercises in young adults, García and Vegara (2019) report that 73% of them indicated that they performed the exercises without the supervision of a professional.

From a more corporate perspective, interesting initiatives are emerging to disseminate scientifically based content. One example is "Activamente" (https://amlfc.es/activamente/), a portal with information on physical activity and exercise, published by university professors of Physical Activity and Sports Sciences at the University of Seville. It is an online platform dedicated exclusively to scientific dissemination about physical activity and sport. Its aim is to bring the science of sport and health to the general population in a clear and accessible way. On their website, they point out that it is not always easy to differentiate between myths and facts. Activamente's mission is to be a reliable source, backed by scientific research, that helps people make informed decisions about their physical and mental well-being.

The Role of Education

Knowledge is a determining factor in the development of physical skills and promotes the recent concept of physical literacy. It is necessary to develop specific knowledge that can be applied and transformed into skills and abilities (Miñana-Signes et al., 2023). Acquiring an active lifestyle for life, being able to enjoy movement and understanding the importance of exercise as an essential part of development are all part of the integrated process of physical literacy (Rial & Faigenbaum, 2018). But this process is not without its difficulties.

In 1992, following the publication of the book entitled "New curricular perspectives in Physical Education: health and modified games", José Devís and Carmen Peiró highlighted an educational experience concerning a theoretical-practical clash in terms of the selection of exercises. These authors report that the reorientation of physical exercises towards the selection of those that are safer and more effective (in the context of physical education classes) to the detriment of others that seem to generate more risk to the musculoskeletal system, caused problems and conflicts in the classroom. Specifically, students who participated in some type of extracurricular physical or sports activity argued about the risks that these exercises could pose, since they performed them regularly in their training sessions. This created a clash of content that led to conflict. This conflict is now reinforced by the beliefs assumed by following certain profiles on social media.

The evolution of educational legislation in the field of Physical Education shows an adaptation of content (now referred to as basic knowledge) to the needs that have arisen with new realities. Thus, Royal Decree 217/2022 on the minimum requirements for Compulsory Secondary Education, in its specific competence 1, raises the need to adopt an active and healthy lifestyle, intentionally selecting and incorporating physical and sporting activities into daily routines based on a critical analysis of body models and the rejection of practices that lack a scientific basis, in order to make healthy and autonomous use of free time and thus improve quality of life (Real Decreto 217/2022). All of this is continued in greater depth in upper secondary education (Real Decreto 243/2022). One of the key elements of the Physical Education curriculum is to consolidate an active and healthy lifestyle that allows students to perpetuate it throughout their lives through autonomous planning and self-regulation of their physical activity and all components that affect health.

Taking into account what will be relevant for adolescents in their physical and sporting activities, we do not have in-depth studies analysing what they learn in compulsory education from the subject of Physical Education. Although the content has been adapted to social reality, there has not been sufficient research into the impact of what is done in Physical Education classes on students' daily lives.

Conclusions

The reality requires intervention by the educational community, especially at the compulsory secondary education and sixth form stages. Experience and evidence show us how our adolescents use social media as a means of prescribing physical exercise. Our task now is to integrate the search for and selection of information with quality criteria into educational curricula, without falling into the trap of theorising about a subject whose foundation is learning through movement. Likewise, research must continuously analyse which fit-influencer profiles are most appropriate, so that concrete proposals can be made that are adapted to the type of physical and sporting activity carried out by the population, especially in those groups most exposed to social media.

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