

VISUAL TRANSLATION OF MEDICAL INFORMATION ON CHRONIC DISEASES. A DESIGN PROPOSAL TO ENHANCE PATIENT EMPOWERMENT

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1. INTRODUCTION

At a communication management level, health care institutions have been opting for progressive patient empowerment for years, giving patients the ability to participate in decision making related to their health, something which up until recently, was a task undertaken exclusively by medical professionals (Lippa & Shalin, 2016). Shared decision-making and patient activation are two core components to patient centered care that significantly improve patient care (Mercer *et al.*, 2018). This growing trend, however, requires greater preparation of patients and their caregivers in terms of healthcare information. In this sense, one of the main challenges that healthcare institutions are faced with is that of providing understandable content for a public not trained in healthcare (Fridman, Saposnik & Sposato, 2017).

In other words, it is not only important what is communicated to the patient, but above all, how it is communicated, to ensure a shared communication code which enables both real two-way communication and co-creational communication between the doctor and the patient.

Information visualization tools represent rich, complex information relating to a patient's health in ways that support clinicians' and patients'

sense-making (Faisal & Blandford, 2012). Efforts are being directed toward determining the best visual encoding for communicating particular concepts to patients. This is necessary because different visual representations may have different impact on patients.

Along these lines, our research aims to continue delving into the gradual visual translation of medical information, and in particular into information linked to diagnostic processes and treatment of diseases in order to contribute to patient decision making, and in consequence, to their empowerment. Additionally, this study highlights the segmentation of information and events during which this information is provided to patients and their caregivers.

Our specific objective is to generate a series of informative and highly understandable visual material about Chronic Obstructive Pulmonary Disease (COPD), Chronic Heart Failure, and Diabetes Mellitus Type 2, based on the theory of co-creation (Botan & Taylor, 2004). We have also defined the significant events when each piece of information should be conveyed. To this effect, we have worked in collaboration with patients and their caregivers, as well as healthcare workers, to achieve results that can be applied in the context of patients with little knowledge of the aforementioned diseases.

2. THEORETICAL FRAMEWORK

Accessible and understandable information is a prerequisite for enabling patients to actively participate in a process of shared decision-making (Keinki *et al.*, 2016).

Although, in most cases, the information provided by healthcare institutions to patients about their state of health is usually given orally and individually in a doctor-patient context (Dowse *et al.*, 2010; Thompson *et al.*, 2010), various studies have demonstrated the need for this oral information to be supported via written patient education material (Anderson, Otterstrom-Rydberg & Karlsson, 2014; Kääriäinen *et al.*, 2011; Tomisa *et al.*, 2017).

This is because relying on solely oral information tends to entail frustration, since the patient is not able to remember all the information (Anderson, Otterstrom-Rydberg & Karlsson, 2014; Shrestha *et al.*, 2018). In this sense, Thompson *et al.* (2010) point out that “only 14% of spoken instructions are remembered” and that our ability to remember diminishes with age. In the same line, Dowse *et al.* (2010) state that “Retention of verbal information is relatively poor, with 40–80% of medical information provided by healthcare practitioners being forgotten immediately”. For this reason, patients prefer to receive written material that can be kept to review at home and answer further questions (Sousa & Turrini, 2012).

However, for the information to be truly useful, it should be intelligible for the majority of the population, something that according to Thompson *et al.* (2010) is not normally the case because

- (a) it is created by paraphrasing product monographs which are written for health professionals;
- (b) it is written by individuals with no knowledge of the medication;
- (c) it contains too much information diluting important details;
- (d) it is not formatted properly;
- and (e) it is difficult to read and understand (Thompson *et al.*, 2010).

This problem “is further exacerbated in low-literacy populations such as those who have not yet completed high school, immigrants, and the elderly” (Thompson *et al.*, 2010).

As a solution, “two-dimensional visuals or pictures in combination with text to facilitate the communication of health-related messages” are usually used (Dowse *et al.*, 2010), since evidence indicates that pictures or visual aids can facilitate comprehension by providing a context for organizing information in the text (García-Retamero, Cokely & Hoffrage, 2015; Pratt & Searles, 2017; Schwartz *et al.*, 2015; Shoemaker, Wolf & Brach, 2014; Tang & Newcomb, 1998; Thompson *et al.*, 2010), and are particularly useful for patients with limited health-literacy skills. In addition, “Visuals tend to be superior to text in terms of attracting attention, increasing the speed of information and message transfer, stimulating motivation and enhancing recall” (Dowse *et al.*, 2010).

However, the commonly held assumption that visuals constitute a universal language (Dowen *et al.*, 2017), which can be easily understood by all, regardless of culture, language, beliefs or education, has been

refuted by research involving cross-cultural testing of visuals (Dowse *et al.*, 2010). In fact, it is clearly evident that pictures do not necessarily communicate the same concepts to all groups, even when the pictured objects are easily recognizable. Decoding relies on the viewer possessing a vocabulary of symbols or visual conventions established through prior exposure to and learning of these visual elements. The inclusion of visuals in patient-education materials is controversial and has attracted some negative attention due to the possibility that images can be misinterpreted, with potentially serious health consequences. As opinions about visual material are inevitably diverse and depend on the reaction of the viewer to that material, it is unlikely that a perfect image that is acceptable to all can be developed.

Nonetheless, according to Moriyama, Harnisch & Matsubara (1994), making the images understood by at least 90% of the potential audience at whom they are aimed would be a sufficient guarantee of utility and would make them “suitable alternatives to verbal expression”.

To obtain successful health-related visuals for low-literate viewers, Dowse *et al.* (2010) suggest that this material

Must be simple pictures with a clear, central focus; represent objects in a realistic rather than a stylised or a cartoon manner; use analogical images if possible (e.g. humans, a bed); include minimal distracting details (e.g. shading, texture lines); contextualise the setting by containing familiar images relating to local clothing, hairstyles, eating habits and other lifestyle elements; be sensitive to cultural and religious norms; give an accurate lifelike representation of the human body; and use the expressive power of the human body to construct meaning through different body postures, arrangements, and facial expressions. The following elements should be avoided or used with caution: the use of isolated body parts (e.g. the ear only); images showing internal anatomy; sequences of multiple images; arrows alone to communicate movement or passage of time; thought and speech bubbles; graphic conventions (e.g. a single slash for ‘do not’); and metaphorical images (e.g. a heart shape to represent love). The design process to produce such visuals should be: preceded by investigation into the target audience’s average educational levels, visual literacy, culture, religious customs, lifestyle, eating habits, clothing, etc.; conducted in close collaboration with the target population; and a multi-stage iterative process of design and evaluation, in order to allow optimal feedback for continuous improvement in visual images.

Moll (1986) examined the communicational value of five styles of illustration (cartoon, matchstick, representational, symbolic, and photographic), presented as educational booklets about osteoarthritis. In his study, photographs emerged as the most generally favorite style by patients, followed in order by symbolic drawings, cartoons, representational drawings, and matchstick images.

Pictorial aids or pictograms, as they are commonly known, are symbols representing concepts, objects, activities, places, or events, are widely used for imparting knowledge to the patients (Shrestha *et al.*, 2018; Thompson *et al.*, 2010). However, according to Dowse *et al.* (2010), pictograms should only be used in association with written or verbal explanations that serve to clarify the image and to convey the complete message.

Communicating numeric information is an essential component of a participatory decision-making model of health care. To do so, graphical representations of numerical expressions of probability, known as visual aids, are used. They include, among others, icon arrays, bar and line charts, and grids.

Patients make more accurate inferences when they receive visual aids representing the numerical information as compared to receiving the same information only in numbers (García-Retamero & Hoffrage, 2013). Visual aids provide an effective means of risk communication, improving comprehension of the risks associated with different lifestyles, screenings, and medical treatments (García-Retamero, Cokely & Hoffrage, 2015). A visual aid is scaleable, allowing a variable number of adverse effects to be shown simultaneously. It can also show absolute risks for more commonly performed behaviors (Pratt & Searles, 2017). Increasing the implementation of visual aids in clinical practice is a simple and efficient means to increase health literacy, improve physician-patient relationships, ensure better health outcomes, and reduce health care expenditures (Pratt & Searles, 2017).

According to Schapira, Nattinger & McAuliffe (2006), not all visual aids are equally effective for all tasks. For example, perceptions of risk magnitude vary with the graphic format used. Identical numeric risks are

perceived to be of greater magnitude when presented with a pictorial display compared with a bar graph. Moreover, graphic displays can be used to help convey probabilistic outcomes.

Furthermore, according to García-Retamero, Cokely & Hoffrage (2015),

[...] bar graphs are useful for comparing data points; line graphs are helpful for depicting trends over time; magnifier risk scales (including magnifying lenses) are useful for depicting small numbers; icon arrays can be helpful for communicating treatment risk reduction and risk of side effects; logic trees can be useful for visually depicting argument structure; and grids can help depict large numbers when communicating the predictive value of medical tests.

Downen *et al.* (2017) examined patient comprehension and perspectives on graphs in communicating projected survival in chronic kidney disease. According to their results, most patients were able to interpret the graphs correctly (Pictograph = 81%, Histogram = 79%, Pie Chart = 77%, Kaplan Meier = 69%). Those aged >65 were less likely to correctly interpret the histogram than those under the age of 65. Patients who had attended high school or a tertiary institution appeared to be more likely to correctly interpret graphs. Eighty-seven percent of patients found the graphs useful in assisting their understanding of the survival data. The pie chart was stated to be the most popular graph of those that had a preference (36%) and the Kaplan Meier the least preferred (12%). Twenty two percent of stated preferences favoured the pictograph but 15% specifically commented that this graph was the least easy to read.

The trend to “illustrate” healthcare material targeted at patients is becoming more and more sophisticated and is now starting to include drawings for booklets aimed at parents, and which resemble children’s stories (Hartling *et al.*, 2010). There are even forays into the world of comic books, known as “graphic medicine” (Tschaepe, 2018). Combinations of words and illustrations allow graphic creators to communicate feelings more richly than through visuals or text alone. Graphic medicine is a medium that uniquely captures dimensions of the crisis and deliberation associated with health care.

Beyond the fundamental role of images, audiovisual and multimedia may also help improve patient knowledge and understanding (Al-Silwadi *et al.*, 2015; Hutchison & McCreddie, 2006; Schwartz *et al.*, 2015). Audiovisual patient information, however, is even more complex in terms of content, style and presentation and it may be more demanding in terms of user involvement and must be performed within the context of the multiprofessional team (Hutchison & McCreddie, 2006; Schapira, Nattinger & McAuliffe, 2006).

To ensure understandability of both printable and audiovisual patient education materials on diverse topics, a collaborative process between health professionals and patients is recommended to develop educational information (Schwartz *et al.*, 2015). Educational materials should be as patient-specific as possible, taking into account the literacy level and any language barriers that may exist (Tang & Newcomb, 1998). Generating educational materials involves gathering preliminary information about the educational message that will be presented to ascertain what the target audience already knows, what they think, imagine or have ignored regarding the subject and what needs the material could address (Sousa & Turrini, 2012). Patient opinions are important and should be included in educational material, as they reflect the perceived needs of participants who have already gone through the experience. Obviously, professional opinions are also important, as patient opinions are based on their own individual experiences and difficulties, which could lead to key information being omitted (Sousa & Turrini, 2012).

3. OBJECTIVES

In this light, our study Effectiveness of a communication intervention for enhancing the experience of chronic patients during hospitalization considers it possible to identify elements of communication, that when applied in a standardized manner at a significant events during a patient's stay in hospital, significantly contribute to improving the patient experience.

Consequently, our objective is to improve patient experience, with the communication field intervening in significant elements and events

during the stay in hospital of patients who have a chronic illness (COPD, heart failure, and diabetes mellitus), and are hospitalized as a result of a flare-up of their underlying disease.

As indicated by Tomisa *et al.* (2017), the number of patients with obstructive pulmonary disease (asthma, COPD) has increased worldwide in the last decade. These patients are not curable but they can be adequately treated, mostly with long-term and sometimes lifelong therapy, or therapeutic combinations. Thus, adherence to medication is one of the critical determinants of the successful management of most chronic diseases (Tomisa *et al.*, 2017). Information materials for chronic patients may contribute to enhancing individual responsibility and disease awareness, effectiveness of device utilization as well as the self-management ability of patients. In these cases, therefore, self-management is particularly important, as its absence could lead to therapeutic failure and finally to increased mortality.

Therefore, we have defined two specific research objectives:

- **RO1.** Identify significant elements and events during a patient's stay in hospital, as a result of a flare-up of their chronic underlying condition, which can be approached from the field of communication.
- **RO2.** Design and agree on, alongside clinicians and patients, communication material that broaches the concepts and events of significance to patients, in order to incorporate them into good clinical practice.

4. RESULTS

Using a qualitative study with a phenomenological approach (Palacios-Ceña & Corral Liria, 2010), we selected the patients by means of purposeful theoretical sampling according to the type and stage of their disease, from April to July 2018. The patients were admitted to the *Consorti Hospitalari de Vic* (CHV), or Vic Hospital Consortium, as a result of a flare-up of one of the three underlying diseases mentioned above.

To obtain the data, two *focus groups* were carried out with patients and relatives, in addition to 15 in-depth, semi-structured interviews during their stay in hospital. 4 specific meetings for co-creation of material with 6 patients, 2 doctors, 1 porter and 2 hospital administration staff were also conducted.

4.1. PARTICIPANTS

4.1.1. Identification stage (RO1)

The participants included in the study were 30 patients of the CHV. They were patients who went to the hospital from home and were admitted as a result of a flare-up of a chronic underlying condition. The chronic conditions included in the study were chronic obstructive pulmonary disease (COPD), chronic heart failure, and adult diabetes mellitus (DMII). Patients with learning difficulties that would hinder understanding of content, and those who were at a serious or advanced stage of the disease were excluded. Patients residing in care homes or other institutions were also excluded.

4.1.2. Design stage (RO2)

The participants included in the co-design stage were organized into two teams: a technical team and a multidisciplinary team.

The technical team was responsible for presenting the results of the first stage, and showing the multidisciplinary team all the choices of tools, action material and methodology available for the co-creation. The technical team was also responsible for gathering inputs from the meetings and proposing the visual translation of the inputs. This team was made up of 4 design and communication experts and 3 clinicians.

The multidisciplinary group was responsible for suggesting, providing, organizing, prioritizing and validating the elements presented by the technical team. At the same time, they were also given tasks. The multidisciplinary group was composed of 2 medical professionals, 3 nursing representatives, 2 administration representatives, 1 porter and 6 patients.

50 people participated in these two stages.

TABLE 1. Study participants

	Men	Women	Total
Identification stage	17	13	30
Focus groups (2)	7	6	13
In-depth interviews (17)	10	7	17
Co-design stage	7	13	20
Technical team	4	2	6
Medical professionals	1	1	2
Communication experts	3	1	4
Multidisciplinary team	3	11	14
Doctors	0	2	2
Nursing representatives	0	3	3
Administration representatives	0	1	1
Porter representatives	1	0	1
Patients	2	4	6
TOTAL	24	26	50

Source: Own elaboration

4.2. MATERIALS AND PROCESSES

The first period studied was that between admission and discharge, that is to say, the time during which a patient is hospitalized.

The methodology used for the identification of significant events and elements for patients (RO1) were two focus groups of patients who had been discharged in the previous two weeks, and 17 in-depth interviews with admitted patients. Three investigators, two as observers and one as a moderator, participated in the focus groups, and one investigator and one interviewer participated in the in-depth interviews. All the meetings were recorded and transcribed for later study.

The questions used were open, and validated by experts in the community of practice *Experiència del Pacient Barcelona* (www.xpabcn.com). Questions were asked about:

- Information received on arrival at the inpatient unit.

- Information received before (why) and after (results) of procedures and diagnostic techniques, and administration of treatment.
- Information on clinical evolution during admission.
- Information received on the decision and reason for discharge, as well as
- Discharge instructions.
- Satisfaction with communication received and with the hospital.

For each of the items to be investigated, we evaluated the levels of awareness, knowledge, interest, support, and action, inquiring about the quality of content, appropriateness of terminology, resolution of doubts, the sender, and the use, comprehension and tone of support materials, among other elements.

The methodology used for the co-creation of content (RO2) was 4 multidisciplinary working meetings, in which views were exchanged between the technical team and the multidisciplinary team.

At the first meeting, the results from the identification stage were explained, possible tools and communication activities were put forward, and some basic preliminary lines of action were selected.

At the following three meetings we presented sketches, codes and fonts, different drafts, and developed the different textual, visual, audiovisual and multimedia content. We carried out assessment and validation of activities, tools, designs, and content through the *affinity diagram* technique and *benchmarking*, discarding material that was not validated. At the end of the fourth meeting, the final approval and validation of all the elements to enhance patient experience during their stay in hospital was carried out.

Photos and field notes were taken during all the meetings.

4.3. ANALYSIS

The material we analyzed was the audio recording of the focus groups and interviews, transcriptions of selected fragments, and field notes taken during the focus groups and interviews. The transcriptions were analyzed, in order to develop an overall picture of the content in terms of the relevance of the topics raised by patients and relatives, and the approach to the topics that we considered relevant. During a second reading, the data was segmented. To that effect, fragments that reflected the same idea (text fragments with the same semantic meaning) were organized into meaningful units.

5. RESULTS

In the identification stage, 13 participants took part in two focus groups and 17 carried out in-depth interviews. The ages ranged from 54 to 86 ($\mu = 73.5$; $SD = 7.8$), they were Caucasian (91%, $n = 31$) and 70.8% were men ($n = 17$).

They defined four key events during their stay in hospital: discharge (54 cases), procedures during hospitalization (42 cases), admission via the emergency department (29 cases) and their stay in hospital (12 cases). They also identified doctors (119 cases) and nurses (127 cases) as the principal interlocutors in the hospital. Finally, they showed an interest in the knowledge of their disease linked to the diagnosis (52 cases), background (43 cases), knowledge (17 cases) and improvement (17 cases) of symptoms. In 40 cases a lack of knowledge of the different elements of the disease was shown. The comments linked to these frequencies can be found interpreted as a series of inputs (Table 2).

TABLE 2: Key events during stay in hospital

Key events	
Stay in the emergency department	All participants were admitted to hospital via the emergency department. Admittance via the emergency department was due to a flare-up of the disease, sometimes a first admittance, and sometimes a readmission.
Stay in hospital	Patients spends at least one night in hospital, the average is five. They provide little information, since they define this as a waiting either for discharge or diagnostic tests. The stay on the ward equates to waiting for information and news. In some cases patients and relatives use their mobile devices to expand on information the medial team has provided
Procedures during hospitalization	Information on procedures is scarce. This is not because patients and nurses are not provided with information, but because of a lack of understanding or a hope of obtaining more information. There are two types of patients: those who do not know what will happen to them and have complete trust in the doctors, and those who are informed and ask the professionals to confirm the information.
Discharge	Patients are informed of their discharge too quickly. On the one hand, patients wish to leave the hospital, but on the other hand they are afraid of relapsing or of their ability to follow the instructions they receive.
Interlocutors	
Medical professionals	The medical professional is the reference for information par excellence. The relationship with the doctor is occasional and brief.
Nursing staff	Nurses transmit affection. Nurses don't give their opinion on treatment or any kind of explanation.
Others	Brief contact is made with porters on the way to diagnostic tests, but a dialogue is not established. Admission via emergency department minimizes contact with administration staff. Beyond the doctors and nurses, the actual dimensions of the hospital are unknown.
About the disease	
Diagnosis	Diagnosis is associated with an explication of the medical record. In most cases there is no differentiation between diseases. The patient is only superficially aware of the disease, which is referred to through symptoms and tests. Sometimes the patient does not know the name of their disease.
Medical history	Patients tend to remember their medical record as a story of their life. Patients tend to relate any medical record to the disease for which they are being treated at that moment.
Symptoms	Symptoms are described from a personal perspective, without associating them with the disease in most cases.
Lack of knowledge	Patients are unaware of all kinds of information, and this generates uncertainty for them: the steps to follow during their stay in the emergency department until their discharge, including the kinds of tests to be carried out, or the consequences of their disease Their stay in hospital is surrounded by mystery for patients and their caregivers.

Source: Own elaboration

The results were presented during the design stage, and from here the participants established a prioritization of contents, segmentation of

information, and its systemization of information linked to specific events. Afterwards, the support, materials and visual codes were defined.

5.1. CONTENT: PRIORIZATION, SEGMENTATION AND SYSTEMIZATION

As can be observed in Table 3, 25 pieces of information have been designed, which are to be given during the patient’s stay on the ward. These pieces of information are linked to specific events and have been classified according to priority. Information linked to diagnostic tests and post-discharge medication is considered high priority, and institutional material of a more corporate nature is considered low priority. Not all material should be provided to all patients, and care should be taken with regards to consumption of the material. Low-priority material fills a corporate gap about the hospital and the people who work there, as well as help fill the time while the patient is in on the ward.

TABLE 3: *Segmentation of content, prioritization, and moment when it should be given to patients*

Content	Moment	Priority
About the illness		
What is COPC?	During stay on ward	Medium
What is heart failure?	During stay on ward	Medium
What is diabetes?	During stay on ward	Medium
What is comorbidity?	During stay on ward	Medium
Flare-up	During stay on ward	Medium
COPD flare-up	During stay on ward	Medium
Heart failure flare-up	During stay on ward	Medium
Shortness of breath	During stay on ward	Medium
About diagnostic tests		
What is a CAT?	During stay in hospital (before the test)	High
What is spirometry?	During stay on ward	Low
After the hospital		
Diets	During stay in hospital (pre-discharge)	Medium
Exercise	During stay in hospital (pre-discharge)	Medium

Stopping smoking	During stay in hospital (pre-discharge)	High
Living with COPD	During stay in hospital (pre-discharge)	Medium
Living with heart failure	During stay in hospital (pre-discharge)	Medium
Medication		
Inhalers	During stay in hospital (pre-discharge)	High
CPAP	During stay in hospital (pre-discharge)	High
Oxygen therapy	During stay in hospital (pre-discharge)	High
The hospital		
Staying in the hospital	During stay on ward	Low
The ward	During stay on ward	Low
The hospital	During stay on ward	Low
The COPC team	During stay on ward	Low
The heart team	During stay on ward	Low
The ward staff	During stay on ward	Low

Source: Own elaboration

5.2. SUPPORT AND MATERIAL

The technical team presented different options for support and material to convey information to inpatients. The members of the multidisciplinary team evaluated the different options and opted for the use of boards, tablets, and printed material (Table 4). With regard to format, the use of graphics was proposed in 90% of cases, and audiovisual format for specific situations. Since these activities entail a financial cost for the hospital, it was decided to work with tablets, allowing for the use of paper. The tablets can include audiovisual material, and the graphics included in the tablets were presented in PDF format, since this is a universal format and cannot be altered. The audiovisual content will be in mp4 format.

TABLE 4: *Functions of supports and formats*

Support	Functions
Boards	Installing boards in the rooms allows the input of changeable information. They will provide the names of the healthcare professionals and the key events the client will experience during the day.
Tablets	The tables will provide stable information about the disease, diagnostic tests, decision-making, or the hospital. The tablets will be used while the patient is on the ward. The tablets can also include a volume of information, enable user interaction, and display audiovisual material. Since tablets do not restrict the amount of pages of information, text and graphics can be spaced to ease readability.
Printed material	The main function of the printed material is to provide patients with information to guide them when they arrive home after discharge, informing them how to take care of their health (diets, exercise, precautions, etc.) and medication. The printed material can substitute some of the functions of the tablets during the patient's stay in hospital.
Formats	Functions
Graphics	The role of the graphics is to facilitate understanding of a definition or element. Graphics are also used to draw attention to a specific element.
Audiovisual	Audiovisual elements are used to expand on explications which are difficult to understand when explained in a static way The use of non-informative audiovisual material (corporative or otherwise) is avoided.

5.3. VISUAL CODES

The participants in the multidisciplinary group opted for the use of classical audiovisual materials of text, icons, or simple figures. They pointed out the need to space out information and break up long paragraphs, prioritizing the information with the use of boldface and other elements that attract attention, such as speech bubbles. They opted for a sans-serif font and for a combination of two colors, with black for texts and a bluish-green as a complement for the illustrations (Table 5).

The participants opted for the use of icons since they are suggestive, but not realistic. Additionally, given that the diseases included in this study affect the elderly, their age was taken into account, and it was deemed necessary to avoid childish illustrations.

TABLE 5: *Visual codes*

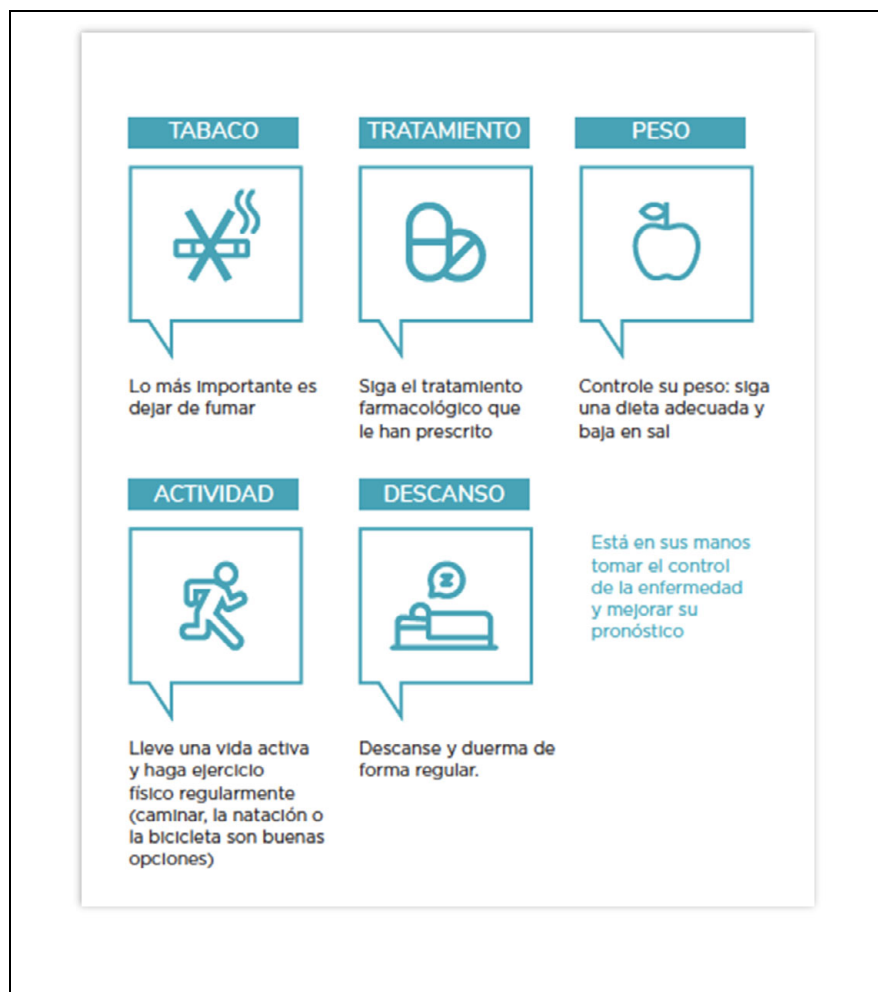
Visual codes	
Format	Landscape format was chosen, 16:9 for tablets, and A4 and A5 for printed material.
Background	The background color should be light to make reading easier. Normally materials are developed on a white background.
Color	Two colors, including black, were used (thereby avoiding confusion with other chromatic codes). A bluish-green color was chosen. This transmits tranquility and contrasts with the white background, making it easy to read. Black and different intensities (grey) complement the bluish-grey color.
Texture	We developed a pattern in order to differentiate areas and spaces without including new chromatic nuances, This pattern is included in light grey and presents front pages and key issues.
Font	A rounded sans-serif font was chosen. Texts are in lower case, with upper case used for titles. A readability test has been carried out, which indicated the minimum font size. Regular font is combined with boldface. To highlight information, the use of reverse type over a green box is suggested.
Illustrations	We include two types of illustrations: indicative illustrations (icons), which guide the reader along the page; and highlighting graphics. We chose the use of the line (contour) and not the stain. Realistic and childish illustrations have been eliminated.
Photos	We chose to avoid using photos since patients may interpret them in different ways.

Source: Own elaboration.

The communication and design team opted to present the information through speech bubbles, thus transmitting the inputs received by the professionals doing their stay in hospital.

Using the results obtained from co-creation with the participants, we tasked professional graphic designers to develop a series of visual materials. This material is completed and is being tested on a new, more recent sample of patients, to ascertain to what extent we have been able to contribute to facilitating the understanding of healthcare material (Figure 1).

FIGURE 1: Examples of visual material





Falta de aire,
respiración fatigosa.
Sensación de ahogo
al estar tumbado.



Cansancio por
esfuerzos que
previamente no se
presentaba.



Falta de apetito.



Aparición de
edemas (retención
de líquidos).



Tos seca y
persistente.



Sensaciones de
mareo, confusión,
mente en blanco.

PRINCIPALES SÍNTOMAS DE LA INSUFICIENCIA CARDÍACA



Se coloca el
paciente en la
mesa de examen
de TAC, **boca
arriba.**



**La mesa se
mueve a través
de la máquina**
mientras se realiza
la exploración.
Dependiendo del
tipo de exploración
por TAC, la máquina
**podría hacer varias
pasadas.**



Le pueden pedir
que **contenga la
respiración durante
la exploración**, ya
que los movimientos
pueden causar
borrosidades en las
imágenes.



La exploración
por TAC
dura unos **30
minutos.**



A veces se
utiliza **material
de contraste**,
dependiendo del
tipo de examen.
Éste puede
ser **ingerido o
inyectado** por vía
intravenosa.

¿CÓMO SE LLEVA A CABO?

PROCEDIMIENTO



Source: Own elaboration

6. DISCUSSION AND CONCLUSIONS

We believe that the results of this study are not only of use for enhancing the understanding of the illnesses in this study, but also that our conclusions on the appropriateness of the visual translation of medical language can be extrapolated to other disorders and conditions, thereby contributing to the empowerment of various types of patients.

It should be noted that participation in this study is centered on a stay in hospital. In this sense, the results of this primary research enabled us to glimpse that, during a their stay in hospital, when patients are not subject diagnostic tests or surgery, they feel trapped in their rooms and are eager to know more about their disease and its evolution. It is the healthcare professionals who, thus far, provide information, normally verbally, which supports the findings of previous studies by Dowse *et al.* (2010) and Thompson *et al.* (2010).

The patient's stay in hospital has turned into an opportunity to convey information. Different supports and materials were considered, and the

co-creation team chose a simultaneous use of support and materials, depending on the moment during the stay in hospital when the information was conveyed, and the type of information that was to be conveyed. Differentiating between support material and new material was considered. Support material concerned admission and the disease, and supported what had already been explained to patients verbally. In this case, knowledge pills should meet visualization criteria according to the profile of the patients: a light background, a contrasting text, prevalence of lower case, and in a single color.

Patients requested illustrations in the form of icons that indicated what they referred to without being totally explicit. These preferences contradict the findings of Dowse *et al.* (2010), who found that patients preferred more realistic images, or Moll (1986), who found that photos were preferred by patients.

The project aims to create a set of materials that medical professionals can provide to patients on a discretionary basis, depending on each situation and moment. This personalization means having the flexibility to adapt the format and the support. Tablets were the first option, but depending on the patient, the paper format was more reliable. Therefore, audiovisual material should not be overused to convey information.

Various studies have shown the increasing importance of visual translation of messages to facilitate understanding and empower the patient (García-Retamero, Cokely & Hoffrage, 2015; Pratt & Searles, 2017; Schwartz *et al.*, 2015; Shoemaker, Wolf & Brach, 2014; Tang & Newcomb, 1998; Thompson *et al.*, 2010), just like the famous quote “a picture is worth a thousand words”. The iconic images guide the patient to the key messages which doctors and nurses have most probably given them, but seeing them in black and white aids understanding.

Our co-creational team opted for the use of boards in the hospital room to convey institutional information of interest to the patient. Boards feature a series of icons with tasks to carry out, while a series of images remind the patient of the names of the hospital staff, medical team and nurses.

Institutional material orientates the patient in the hospital and can be used to complement the role of doctors and nurses by conveying, on the one hand, practical information, and on the other hand, corporate information.

7. LIMITATIONS

There are several limitations of our study. Firstly, since we focused on topics related to the communication and transmission of information, other potentially interesting elements relating to patient experience may have been disregarded.

Another possible limitation is the advanced age of the participants, their rural origins, and the effects of their chronic disease: details which hampered data collection, due to the constant need to focus on the issues at hand, as well as limit the findings of our study to the sample. Nevertheless, given the chronicity of their conditions, the sample comprised patients who were familiar with the system and who were consumer of healthcare services, which made them experts of hospital experiences.

Regarding the multidisciplinary team, the limitations can be attributed to the specific bias of each profile included in the teams, and to the selection bias of previous elements suggested by the technical team, as well as in their moderating capacity.

Finally, limiting co-creation to four meetings for exchanging views and evaluating the information materials or elements presented is also a bias, which should be taken into account.

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TRASTORNOS DE CONDUCTA ALIMENTARIA
EN ESTUDIANTES UNIVERSITARIOS DEL GRADO
DE ARTES VISUALES Y DANZA DEL INSTITUTO
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1. INTRODUCCIÓN

Los Trastornos de Conducta Alimentaria (TCA) se caracterizan por anomalías en el comportamiento de la ingesta de alimentos, como intento para controlar el peso, cuya base recae en una alteración psicológica. Se identifican por la presencia de un patrón conductual disfuncional donde la persona suele desarrollar una relación nociva con la comida, acompañada de una preocupación excesiva por su peso/talla. Fruto de este malestar, la persona afectada puede responder mediante la restricción de alimentos, atracones y/o conductas purgativas como el vómito, el uso de fármacos o el ejercicio excesivo, entre otros (Ruesga-Lozano & Chávez-Aguilar, 2015). Este tipo de trastornos son problemas de salud mental y

afectan principalmente a mujeres jóvenes y se constituyen en trastornos severos casi siempre crónicos. (Fernández-Rivas, 2021; Herpertz-Dahlmann, 2009).

Son la anorexia nerviosa (AN), bulimia nerviosa (BN) y trastorno alimentario no especificado (TANE) las enfermedades más frecuentes que conforman el grupo de los TCA según el Manual Diagnóstico y Estadístico de los Trastornos Mentales, quinta revisión (DSM-5), de la American Psychiatric Association (Roher, 2013).

En las disciplinas estéticas, entre las que se encuentran la danza y el circo, la gran complejidad técnica en sintonía con cualidades físicas: fuerza, flexibilidad, velocidad, coordinación y equilibrio entre otros, junto a una buena imagen corporal (IC), son algunos de los determinantes en el éxito. En el mundo de la danza existen elementos, que son fundamentales en el rendimiento de una bailarina. El vestuario, la alimentación, los horarios de clase, el profesor, los espejos, las audiciones, las funciones y los demás estudiantes dentro de la clase. (Ceballos, 2018).

Son varios los estudios realizados en danzas que indican la gran importancia de la figura delgada por parte de los bailarines, siendo el sexo femenino en mayor medida las que muestran mayores riesgos de padecer TCA (Doval et al., 2014; Mackrell et al., 2012; Rutzstein et al., 2007).

Resulta importante recalcar que el género masculino también sufre estos trastornos, sin embargo, parece que hay menos preocupación al respecto entre ellos, estando más preocupados en adquirir las demandas de fuerza y volumen muscular que se les exigen más que la extrema delgadez. (Ceballos, 2018).

En el caso del circo no se han encontrado referencias bibliográficas que analizan dichos trastornos o preocupaciones por la IC, no obstante, la disciplina acrobática circense a la que pertenecen los estudiantes de este grado universitario se asemeja a diversas disciplinas gimnásticas en las que si hemos observado estudios que analizan el riesgo de padecer TCA, llegándose a la conclusión que los gimnastas en mayor medida el sexo femenino posee mayor obsesión por la delgadez y riesgo de padecer bulimia en altos niveles de entrenamiento (Deutz et al., 2000; Jonnalagada & Benardot, 2000; Salas-Morillas et al., 2022).

De lo anteriormente expuesto, son escasos los estudios referentes a bailarinas de ballet y gimnastas, siendo inexistente en las disciplinas circenses. Además, no tenemos constancia de estudios que analicen de forma conjunta a bailarines con artistas de circo el riesgo de padecer TCA.

2. OBJETIVOS

Como objetivo principal fue evaluar y comparar los TCA en universitarios del grado en Artes Visuales y Danza.

3. METODOLOGÍA

3.1. PARTICIPANTES

Este estudio sigue una metodología no experimental, de tipo descriptivo y corte transversal con el uso de la encuesta (en concreto cuestionario autoaplicado) como herramienta para recoger la información.

Se contó con la participación de 37 estudiantes universitarios entre 18 y 27 años ($M=20,95$ $DT=2,13$) divididos en dos grupos Circo (15 universitarios) y las diferentes Danzas (22 universitarios) clásico, contemporáneo y español.

3.2. VARIABLES E INSTRUMENTOS

Para la variable de TCA se utilizó el *Eating Disorders Inventory* (EDI-3-RF), o Inventario de Trastornos de Conducta Alimentaria-3 de Garner, (2004), en su adaptación española (Elosua et al., 2010). Permite realizar una rápida evaluación con criterios estandarizados para descartar o confirmar la presencia de TCA. Se puede obtener una puntuación individualizada de cada una de las tres escalas: obsesión por la delgadez (compuesta por 7 ítems), comportamientos bulímicos (8 ítems) e insatisfacción corporal (10 ítems), además de una puntuación total, con el sumatorio de los 25 ítems.

- La escala de obsesión por la delgadez (DT) mide un intenso impulso dirigido a estar más delgado o un fuerte temor a la gordura, convirtiéndose en un buen predictor de la aparición de atracones o del desarrollo de TCA. El rango de puntuaciones directas va de 0 a 20, siendo 12 el valor crítico (García et al., 2010).
- La escala de comportamientos bulímicos (B): evalúa la tendencia a tener pensamientos sobre comer de forma desahogada, o a darse comilonas o atracones de comida incontrolables. El rango de puntuaciones directas va de 0 a 32, encontrándose los valores críticos entre 5 y 8 en función del IMC de los gimnastas.
- La escala de insatisfacción corporal (BD): valora la insatisfacción del sujeto con la forma general de su cuerpo o con aquellas partes del mismo que más preocupan a los que padecen TCA: estómago, caderas, muslos, nalgas, etc. El rango de puntuación directa va de 0 a 40, donde se indican tres niveles diferentes en función de la intensidad de la insatisfacción corporal: 0-6 baja, 7-27 media y 28-40 alta.

Por último, este cuestionario permite la orientación de posible remisión de los sujetos a un servicio de atención especializada en función de tres criterios establecidos:

- El criterio 1, se basa únicamente en el IMC del sujeto. En función del sexo y la edad se detecta si posee un peso corporal excesivamente inferior.
- El criterio 2, relaciona el IMC con la presencia de preocupaciones excesivas por el peso, la comida o patrones de alimentación complicados (valorados por las escalas DT y B).
- Y por último el criterio 3, que se basa en la presencia de síntomas conductuales que advierte de un posible TCA (evaluados con la parte B del cuestionario).

La consistencia interna de este instrumento a través del alpha de Cronbach es adecuada presentando valores entre 0,64 y 0,92 en muestras no clínicas españolas y mexicanas (Garner, 2004). Igualmente, Segura-

García et al. (2015) señalan que el instrumento cuenta con 98,8% de especificidad, 93,7% de sensibilidad y coeficiente Kappa de Cohen de 0,69 ($p < 0,001$).

- Para estimar el índice de masa corporal (IMC), se utilizó el peso y la talla. El peso se determinó con una báscula digital TEFAL, precisión de 0,05 kg y para la talla se utilizó un tallímetro SECA 220 con precisión de 1mm. Con ambas medidas se aplicó la fórmula peso (kg)/altura (m)² y se obtuvo el IMC (Kg/m²) para conocer el estado de salud en el que se encontraban las adolescentes.

Procedimiento

Primeramente, se obtuvo la autorización del centro universitario, tras exponer los objetivos estudio. Igualmente, se contó con la firma del consentimiento informado de los participantes implicados en función de la legislación vigente (Ley 41/2002 de 14 de noviembre) cumpliendo con los principios éticos expresados en la Declaración de Helsinki.

Se acudió al centro universitario donde se pasaron los cuestionarios, siempre en presencia de la autora y se recalcó el derecho al anonimato.

Igualmente, las medidas antropométricas fueron tomadas por dos responsables de este trabajo previamente entrenados en el propio centro universitario. La toma se realizó con los estudiantes sin zapatos y con ropa ligera.

La estatura se midió con el adolescente de pie, en posición firme y con la cabeza en el plano de Frankfort (línea imaginaria que une el borde inferior de la órbita de los ojos y el conducto auditivo externo) siendo el registro en centímetros y milímetros; en el peso se colocó a cada adolescente en el centro de la báscula, con los brazos a los lados del cuerpo, sin moverse y respirando normalmente registrándose la lectura en kilos y gramos.

Análisis estadístico

Para realizar el análisis estadístico se empleó el programa SPSS en su versión 22.0 (SPSS Inc., Chicago IL, USA). Se analizó la normalidad de la distribución a través del estadístico Shaphiro-Wilk. Se utilizó la prueba U de Mann-Whitney para comprobar la existencia de diferencias significativas entre los estudiantes de circo y danza en función de cada una de las escalas del EDI-3-RF. Se realizó el análisis correlacional a través del estadístico R de Spearman.

4. RESULTADOS

A continuación, se detallan los datos descriptivos de las variables observándose así mismo media y desviación típica divididas en función del sexo y mención (danza y circo) (tabla 1).

TABLA 1. Descriptivos de las diferentes variables en función de la mención y sexo.

	DANZA			CIRCO			TOTAL		
	H (n=4)	M (n=18)	T (n=22)	H (n=6)	M (n=9)	T (n=15)	H (n=10)	M (n=27)	T (N=37)
Peso (kg)	67,25±8,06	53,81±6,59	56,25±8,52	75,17±10,83	50,29±5,14	60,24±14,70	72±10,18	52,63±6,27	57,87±11,42
Altura(m)	1,76±0,04	1,64±0,07	1,66±0,08	1,78±0,1	1,59±0,04	1,66±0,12	1,77±0,08	1,62±0,07	1,66±0,1
IMC	21,81±2,97	20,13±2,73	20,44±2,78	23,63±1,90	20,01±1,97	21,46±2,63	22,91±2,41	20,09±2,46	20,85±2,73
DT	15,75±7,89	17,33±9,23	17,05±8,85	20,50±6,72	12,56±10,01	15,73±9,47	18,6±7,2	15,74±9,58	16,51±9
B	11,00±4,55	10,56±9	10,64±8,28	18,67±7,81	8,56±8,40	12,60±9,4	15,6±7,52	9,89±8,69	11,43±8,68
BD	18,25±4,03	20,33±4,75	19,95±4,61	23,67±2,58	23,89±3,79	23,8±3,26	21,5±4,12	21,52±4,70	21,51±4,49

En la tabla 2 se describe la frecuencia y porcentaje de los sujetos que se encuentran en valor crítico de las diferentes escalas Obsesión por la delgadez (DT).

TABLA 2. Frecuencia (porcentaje) de los estudiantes que se encuentran en valores críticos de las variables Obsesión por la delgadez (DT) y Bulimia (B) en función de la mención y sexo.

MENCIÓN	SEXO	DT	B
DANZA	H (n=4) %	3(75,0)	3(75,0)
	M (n=18) %	12(66,7)	12(66,7)
	T (n=22) %	15(68,2)	15(68,2)
CIRCO	H (n=6) %	6(100,0)	6(100,0)
	M (n=9) %	3(33,3)	5(55,6)
	T (n=15) %	9(60,0)	11(73,3)
TOTAL	H (n=10) %	9(90,0)	9(90,0)
	M (n=27) %	15(55,6)	17(63,0)
	T (n=37) %	24(64,9)	26(70,3)

En la tabla 3 se presenta en frecuencia y porcentaje los niveles de insatisfacción corporal en función del sexo y mención, observándose un alto porcentaje de ellos en insatisfacción moderada según el EDI-3RF.

TABLA 3. Frecuencia (porcentaje) de los distintos niveles de Insatisfacción Corporal (EDI 3 RF) en función de la mención y sexo.

MENCIÓN	SEXO	Baja	Moderada	Alta
DANZA	H (n=4) %	-	4(100,0)	-
	M (n=18) %	-	18(100,0)	-
	T (n=22) %	-	22(100,0)	-
CIRCO	H (n=6) %	-	6(100,0)	-
	M (n=9) %	-	8(88,8)	1(11,1)
	T (n=15) %	-	14(93,3)	1(6,6)
TOTAL	H (n=10) %	-	10(100,0)	-
	M (n=27) %	-	26(96,2)	1(3,7)
	T (n=37) %	-	36(97,2)	1(2,7)

En la tabla 4 se muestran la frecuencia y porcentaje de remisión del sujeto a tratamiento según los tres criterios establecidos por el EDI-3RF.

TABLA 4. Frecuencia (porcentaje) de los sujetos que cumplen los criterios de remisión en función de la mención y sexo.

MENCIÓN	SEXO	Criterio 1	Criterio 2	Criterio 3
DANZA	H (n=4) %	-	4(100,0)	2(50,0)
	M (n=18) %	6(33,3)	14(77,8)	11(61,1)
	T (n=22) %	6(27,2)	18(81,8)	13(59,1)
CIRCO	H (n=6) %	-	6(100,0)	6(100,0)
	M (n=9) %	2(22,2)	5(55,6)	4(44,4)
	T (n=15) %	2(13,3)	11(73,3)	10(66,6)
TOTAL	H (n=10) %	-	10(100,0)	8(80,0)
	M (n=27) %	8(29,6)	19(70,3)	15(55,5)
	T (n=37) %	8(21,6)	29(78,3)	23(62,1)

Cómo podemos observar en la tabla 5 destacan las diferencias en la escala de insatisfacción corporal entre ambas menciones.

TABLA 5. Diferencias a través del estadístico U de Mann Whitney en función de la mención.

	IMC	DT	B	BD	C1R	C2R	C3R
U de Mann Whitney	123,0	145,5	148,5	80,5	142,0	151,0	152,5
Z	-1,299	-0,604	-0,511	-2,624	-0,997	-0,607	-0,460
P	0,194	0,546	0,609	0,009	0,319	0,544	0,645

5. DISCUSIÓN

La presente investigación tuvo como objetivo evaluar y comparar los TCA entre los universitarios del grado en Artes Visuales y Danza.

Los alumnos de este estudio, se muestran vulnerable a desarrollar este tipo de trastorno lo que refuerza los resultados obtenidos en trabajos previos (Benn & Walters, 2001; Nordin-Bates et al., 2011).

Se ha podido corroborar que la práctica de disciplinas artísticas en las que tener un cuerpo fino debido a la estética que exige a los artistas un control del peso aumenta sus posibilidades de padecer dichos trastornos (Alandete, 2011).

El 67,6% de los estudiantes presentaron riesgo de desarrollar TCA, siendo mayor en los estudiantes de danza que en los de circo en rasgos generales. Prueba de ello, es que los resultados del IMC en los estudiantes que cursan las especialidades danza son los que mayores dificultades tienen para mantener un peso adecuado para su edad y altura. El 27.2% presentaron infrapeso con respecto a los 13,3% de los destudiantes del circo.

Varios estudios también expusieron porcentajes similares en artistas con riesgos de TCA, siendo predominantes en las mujeres (Price & Pettijohn, 2006).

En función del sexo en nuestro trabajo, los resultados indican mayor incidencia de TCA en las mujeres (Price & Pettijohn, 2006). De acuerdo a las tres escalas del EDI-3-RF, destacan las puntuaciones en riesgo de padecer bulimia en ambos sexos. Son los alumnos de circo los que mayor riesgo de padecer bulimia poseen, siendo al contrario en la escala de obsesión por la delgadez, que son los alumnos de danza los que mayores resultados reportan. Igualmente, las únicas diferencias significativas se dieron entre ellas, en la escala de Insatisfacción corporal entre ambos sexos, siendo mayor esta en el género femenino.

En concreto, la Obsesión por la delgadez destaca en los alumnos masculinos y en la mención de danza de manera aislada, resultados contrarios a los encontrados donde son las mujeres las que mayor obsesión por la delgadez reportan (Fortes et al., 2013ab; Iannidou & Venetsanou, 2019; Laffitte et al., 2013; Martínez-Rodríguez et al., 2020). Obsesión manifestada por el deseo de tener un físico más delgado, temor a ganar peso y preocupación por la alimentación. Dicha obsesión determina un factor principal de riesgo a tener en cuenta en el desarrollo de los TCA (Mazzeo & Bulik, 2009).

Con respecto a los criterios de remisión, en este estudio observamos que todos los estudiantes cumplen al menos con algún criterio de remisión menos el género masculino en el criterio 1 que se relaciona con el IMC de los mismos. Del género femenino solo un 29,6% cumplen con el criterio 1 que se relaciona exclusivamente con IMC bajos, lo que implica una alerta y no remisión directa a especialista, también esto nos indica que la mayoría de la muestra se encuentra en un IMC saludable. El

porcentaje más elevado son los del criterio 2, 78,3% del total de la muestra cumple siendo en el total de los hombres y un 70,3% de las mujeres, de forma preventiva deberían ser derivados por la existencia de obsesión por la delgadez y patrones bulímicos. En cuanto al Crit. 3, el 62,1% de los estudiantes de la muestra total (80 % hombres y 55,5% mujeres), tendrían que ser derivados por presentar alguna conducta extrema de control del peso en los últimos tres meses (atracones, vómitos, laxantes, ejercicio), o bien por la pérdida drástica de peso en los últimos nueve meses. Resaltar que mayormente los estudiantes masculinos de circo fueron los que cumplieron con este último Crit. 3 referente a síntomas conductuales que advierten de un TCA y remisión obligatoria.

En general, los porcentajes de remisión declarados en este estudio podrían parecer elevados, por encima de los encontrados en trabajos en Toro et al. (2009). Pero estas comparaciones han de realizarse con cautela, ya que en ninguno de estos estudios se ha aplicado el EDI-3-RF, con lo cual no se ha analizado las posibilidades de remisión.

A nivel global, todos los estudios encontrados afirman el riesgo de padecer TCA en disciplinas estéticas entre ellas las diferentes danzas, aceptándose que cuanto mayor es el nivel del bailarín mayor es el riesgo de padecer dichos trastornos (Ribeiro & Da Veiga, 2010; Schluger, 2009; Toro et al., 2009).

En el estudio García et al. (2013), se observa la internalización del cuerpo ideal delgado en la danza clásica y un aumento del IMC en la española con mayor riesgo de padecer TCA.

Un resultado especialmente preocupante del presente estudio es que, los resultados obtenidos en el Criterio de Remisión 3 son elevados (62,1% de la muestra total) lo que obliga a remisión directa a un especialista.

6. CONCLUSIONES

El interés de este trabajo tiene como objetivo evaluar y comparar los TCA entre los universitarios del grado en Artes Visuales y Danza.

A nivel global, se puede concluir que existen altos porcentajes de estudiantes que presentan insatisfacción corporal, siendo mayor en las chicas

y en concreto en las que realizan danza. En general, los estudiantes presentaron valores medios de riesgo de TCA, siendo los factores de riesgo mayores la obsesión por la delgadez y los comportamientos bulímicos. En cuanto a la mención son los estudiantes de circo los que mayor riesgo presentan sin diferencias significativa, así como destaca el sexo femenino en todas las escalas analizadas.

No obstante, estos resultados han de tomarse con cautela, ya que se ha aplicado el EDI-3-RF, cuestionario diseñado para población “normal”, lo que conlleva que ciertos comportamientos considerados preocupantes en una población “normal” sean normales en población que practique disciplinas estéticas.

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