Uncertainty Tolerance in Physiotherapists: implications for their education from an observational study

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Abstract: Although uncertainty is common in the field of physiotherapy, little research has been conducted on the topic of uncertainty tolerance (UT). This study builds on previous research that explored UT in novice physiotherapists and identified their educational needs in relation to UT using the self-developed "Tolerance to Uncertainty in Physiotherapy" (TUP) questionnaire. The present work aims to explore UT in experienced physiotherapists, identify their educational needs regarding uncertainty management, and compare them with novice physiotherapists. A cross-sectional quantitative observational study was conducted involving 40 physiotherapists with an average work experience of 11.9 ($\pm$7.52) years participated. The results show that the evaluated physiotherapists had a medium-high UT with 51 points (5.99) on the TUP scale. Years of experience could not be confirmed as a good predictor of UT, although a trend towards improved UT was observed (r= -0.075, p-value = 0.645). Experienced physiotherapists were less nervous or anxious about unknown diagnoses and had less difficulty switching off mentally. However, they were in agreement with novice physiotherapists in terms of requesting more diagnostic tests or more frequent appointments. Implementing educational programmes to improve UT during the training period and in experienced professionals is essential.

Keywords: ambiguity; uncertainty; tolerance; education; physiotherapy

Resumen: Aunque la incertidumbre es común en el campo de la fisioterapia, se han realizado pocas investigaciones sobre el tema de la tolerancia a la incertidumbre (UT). Este estudio se basa en investigaciones anteriores que exploraron la UT en fisioterapeutas novatos e identificaron sus necesidades educativas en relación con la UT utilizando el cuestionario de "Tolerancia a la incertidumbre en fisioterapia" (TUP) de desarrollo propio. El presente trabajo tiene como objetivo explorar la UT en fisioterapeutas experimentados, identificar sus necesidades educativas con respecto al manejo de la incertidumbre y compararlos con fisioterapeutas novatos. Se realizó un estudio observacional cuantitativo transversal en el que participaron 40 fisioterapeutas con una experiencia laboral promedio de 11,9 ($\pm$7,52) años. Los resultados muestran que los fisioterapeutas evaluados tuvieron un UT medio alto con 51 puntos (5,99) en la escala TUP. No se pudo confirmar que los años de experiencia sean un buen predictor de UT, aunque se observó una tendencia hacia una mejora de UT (r = -0,075, valor de p = 0,645). Los fisioterapeutas experimentados estaban menos nerviosos o ansiosos ante diagnósticos desconocidos y tenían menos dificultades para desconectarse mentalmente. Sin embargo, coincidieron con los fisioterapeutas noveles en cuanto a solicitar más pruebas diagnósticas o citas más frecuentes. Implementar programas educativos para mejorar la UT durante el periodo de formación y en profesionales con experiencia es fundamental.

Palabras clave: ambigüedad; incertidumbre; tolerancia; educación; fisioterapia

1. Introduction

The study of uncertainty tolerance (UT) has been developed mainly for physicians, and is a field scarcely explored in physiotherapy (1). However, uncertainty is a fundamental, inexorable part of the clinical practice of healthcare professionals (2–4), and physiotherapists are no exception. Physiotherapists will experience uncertainty frequently throughout their careers, so they must be prepared to tolerate situations of uncertainty effectively (1). The psychological stress associated with this near-constant state of uncertainty is known as "uncertainty intolerance" (5), and its importance lies in the adverse effects it can have on the healthcare provider and the patient. Low UT has been linked to stress and anxiety in healthcare professionals, generating psychological distress and consequently increasing the chances of suffering from burnout syndrome (6–9). In addition, low UT has been linked to increased requests for medical tests and hospital admissions, with the potential discomfort it may cause patients (9). Despite these adverse effects, UT is subjective and dynamic (3). Therefore, how an individual experiences uncertainty can result in cognitive, emotional, or behavioural manifestations, both negative and positive (10). In this context, it is noted that uncertainty may be an invitation for medical students to seek information or improve their problem-solving skills, developing an adaptive response to uncertainty and thereby improving their UT (11). Other positive effects that uncertainty has been linked to are the stimulation of originality and the consideration of uncertain situations as a challenge for the healthcare professional (2, 12). Moreover, in recent years, it has been suggested that UT is not a static skill without capacity for improvement, but a dynamic process that can be modified through the acquisition of experience or through training actions (13–14). In this sense, it has been observed that more experienced physicians have higher UT and lower risk aversion compared with less experienced physicians, thus leading to the determination that experience can be a good predictor of UT (15–17). It has been found that training actions can act as moderators of UT (10) problem-based learning, simulation, and medical humanities-based programmes proposed as the preferred educational methods (10, 18–19). Therefore, there is a call for the formal inclusion of these methods in medical curricula (20–22).

Therefore, Lee et al. (20) developed a taxonomy of uncertainty, analysing previous models and aiming to aid medical education. This taxonomy proposes that uncertainty is made up of three interrelated dimensions. The first dimension, referred to as "sources of uncertainty", pertains to knowledge and information-management factors. Thus, an absence of information, ambiguity, complexity, and lack of clinician knowledge would be categories of this dimension. The second dimension, "subjective influences of uncertainty", relates to personal and emotional aspects that affect the perception of uncertainty. Accordingly, when faced with a situation of uncertainty, the clinician may perceive it as a threat and experience feelings of anxiety, insecurity, or stress. It could also be perceived as an opportunity to experience excitement or motivation. The third and final dimension, "responses to uncertainty", concerns the behaviour or strategies that a person adopts in situations of uncertainty. Thus, aspects of this dimension include sharing feelings of uncertainty with the patient or colleagues, seeking information, and requesting more tests or more frequent appointments with the patient. This taxonomy provides a structure that facilitates health professionals' understanding of uncertainty, enabling educators to identify the different aspects of uncertainty and recognise the dynamic nature of uncertainty.

Using this taxonomy as a reference, a study was previously carried out on recent physiotherapy graduates with a twofold objective. On one hand, the aim was to evaluate UT; on the other hand, the objective was to identify the different needs that the graduates presented in the management of uncertainty, which can be addressed through educational actions. For this purpose, a questionnaire that we created was used, based on the questionnaires most commonly employed in the literature and specifically adapted to the physiotherapy field. This study made it possible to establish a profile of novice physiotherapists in the sample who presented lower UT in aspects related to the ambiguity of information and the complexity of cases, which correspond to the "sources of uncertainty" dimension. Requesting more diagnostic tests or more frequent patient

appointments stood out as the preferred strategy used to manage uncertainty. It was also observed that the physiotherapists in the sample preferred not to share their uncertainty with their patients. However, they did use support networks such as consultation with professional colleagues.

At this point, it is necessary to further explore uncertainty in physiotherapists, analysing whether UT is modified with professional experience and whether their educational needs, in terms of uncertainty management, vary compared with recent graduates. To address this, we conducted a cross-sectional quantitative observational study to assess UT in a group of physiotherapists with different work experiences and identify their uncertainty management educational needs.

2. Methods

Objective

The study's main objective was to assess UT in a group of physiotherapists with different work experiences and identify the educational needs they may present relating to uncertainty management. In addition, the findings will be compared with those found in previous research involving junior physiotherapists. This data will give physiotherapy educators a foundation to commence training future professionals at the UT. A cross-sectional quantitative observational study was carried out.

Population and sample

The population considered in this study comprised physiotherapists in Gran Canaria who had completed their studies before 2019. The sample was limited to Gran Canaria to coincide with the criteria chosen in the study for novice physiotherapists and to ensure homogeneity. According to data from the Official College of Physiotherapists of the Canary Islands, 942 physiotherapists were registered on the island of Gran Canaria on December 31, 2019 (23). Participants were selected using convenience sampling, and 197 physiotherapists were contacted via a mobile phone messaging application. Subsequently, they were informed about the purpose of the research and provided with the link to access the online questionnaire. Signing the informed consent form and having more than two years of work experience were prerequisites to participating in the study. More than two years of work experience was considered for comparison with the study of novice physiotherapists whose work experience was less than two years.

Instrument

For the data collection, the "Tolerance to Uncertainty in Physiotherapy" (TUP) questionnaire, which had been designed and tested in previous research (24), was used. This is a questionnaire developed specifically for physiotherapists, based on the validated questionnaires most commonly used in the literature to measure uncertainty. Then, a psychometric analysis was performed to assess its reliability, and a factor analysis was performed to determine its internal structure. It explores the following three dimensions of uncertainty described in Lee et al.´s (20) taxonomy: sources of uncertainty, subjective influences of uncertainty, and responses to uncertainty. The TUP questionnaire is composed of 20 items with a 5-point Likert scale, of which items 1, 3, 6, 15, 17, 18 and 20 are reverse scored. To make it easier to identify the questionnaire items, we named them with an initial letter corresponding to the dimension of uncertainty to which they belong, followed by the question number. For example, the questions corresponding to the sources dimension start with "S", the questions related to the subjective influences of uncertainty begin with "I", and the items associated with reactions to uncertainty start with "R". The score that can be obtained in the questionnaire ranges from 20 to 100 points. Higher values correspond to lower UT, and lower values mean higher UT. In a previous work in which the TUP questionnaire was used, the value of Cronbach's alpha coefficient was 0.59. Given this scenario, an exploratory factor analysis was carried out to examine the structure and relationships within the group of variables observed. Bartlett's test of sphericity was significant (p-value < 0.001), and the Kaiser–Meyer–Olkin (KMO) test indicated that items did not exceed a

minimum of 0.50. Demographic data such as gender and age were also collected, as well as professional data such as year of completion of studies, years of work experience as a physiotherapist, and current employment status. The questionnaire was initially designed and distributed to participants in Spanish; an English version is already completed but still needs to be validated.

Data collection and analysis procedure

The TUP questionnaire was provided to the population online, and data were collected from March 1 to 15, 2023. In order to participate in the study, it was first mandatory to provide voluntary informed consent. The consent form explained the purpose of the study, and guaranteed anonymity and confidential treatment of the data. In addition, an e-mail address was also provided to the participants in case they had any questions, or wanted to exercise their rights to modify their data or withdraw from participation at any time. The statistical data analysis was conducted using the statistical software JAMOVI (25–26). Categorical variables were summarised using percentages and absolute frequencies. The equality of the proportions of categories was tested using binomial non-parametric tests. Numerical variables were summarised using the mean and standard deviation (SD), in addition to the minimum and maximum values of the data. The student's t-test, was used to compare the means between male and female professionals, since the data's normality condition was met. Kendall's Tau-b correlation coefficient was used to analyse the possible association between the variables of the TUP questionnaire. The results were considered statistically significant if the p-value < 0.05. The correlations between questionnaire variables were represented using VosViewer software (27). To analyse the possible association between the numerical variables "years worked" and "TUP questionnaire score", we used Pearson's linear correlation coefficient.

Bias

Due to the nature of survey research, there might have been some selection bias.

Ethics statement

This study was granted an exemption from research ethics review due to its nature as a survey study. Informed consent was obtained from all subjects involved in the study. The consent informed of the purpose of the study, guaranteed anonymity and confidential data treatment. In addition, an e-mail address was provided to resolve their doubts and exercise their rights to modify their data or renounce their participation.

3. Results

Descriptive analysis of the participating physiotherapists

The overall response rate was 20.3% (40/197), and the final sample comprised 40 physiotherapists who responded to the questionnaire during the data collection period and met the inclusion criteria. All participants were residents of Gran Canaria and were between 25 and 60 years of age, with a mean age of 35.9 ($\pm$8.06). By gender, the distribution of responses was 57.5% (23) for women and 42.5% (17) for men, and there was no response for the other options. No significant difference was detected between the two selected categories (p = 0.430). Table 1 shows other characteristics of the assessed physiotherapists.

Association between work experience and overall results in TUP questionnaire

Pearson's linear correlation coefficient obtained a result of r = -0.075 (p-value = 0.645), which leads to the conclusion that no significant linear relationship is detected between years of work experience and the overall results obtained in the TUP questionnaire.

Table 1. Characteristics of the assessed physiotherapists

Characteristics	No.	%
Gender		
Male	17	42,5
Female	23	57,5
Other option	0	0
Workplace		
Free practice	28	70
Employed in companies	10	25
Not working as physiotherapists at the time	2	5
Teamwork		
Working in a multidisciplinary team	9	72,5
Not working in a multidisciplinary team	29	22,5

Analysis of the results of the TUP questionnaire

The results of the TUP questionnaire reveal a mean score of 51 (5.99) points, with a minimum of 39 and a maximum of 63 points. If we differentiate by gender, we notice that the female gender has a mean score of 53.17 ($\pm$6.58) compared with 48.06 ($\pm$3.45) for male participants; this difference is significant (p-value = 0.003). However, it should be noted that the standard deviation is 3 points higher for male than for female participants. In order to assess whether there is an association between the numerical variables "years worked" and "TUP questionnaire score", Pearson's linear correlation coefficient was used. The value obtained was r = -0.075 (p-value = 0.645), which allows us to conclude that no significant linear relationship is detected. Table 2 shows an analysis of the scores obtained in each dimension proposed by Lee et al. (2020). The dimension "sources of uncertainty" stands out as the aspect that contributes the most to the overall TUP questionnaire score. The dimension "responses to uncertainty" was the second-highest scoring aspect, followed by the "subjective influences of uncertainty" dimension.

Table 2. Analysis of results by dimension.

Dimension	Score	Mean (SD)
Sources of uncertainty	7 to 35	19.9 (2.80)
Subjective influences of uncertainty	6 to 30	13.4 (3.65)
Responses to uncertainty	7 to 35	17.7 (3.11)

An analysis of the results of each of the questions in the TUP questionnaire was performed and is reflected in Table 3. The questions that contributed the most to the uncertainty intolerance score are, in descending order, S5Q, R16Q, S2Q, S6Q_INV, and R14Q. It is observed that the highest scoring items belong to the "sources of uncertainty" and "reactions to uncertainty" dimensions. Item S5Q (If I am uncertain about my patient's problem, I always encourage him/her to ask for further diagnostic tests) scored the highest on the questionnaire. The second-highest score in the questionnaire corresponds to question R16Q (I prefer that patients do not know that I am unsure about which treatments to use), which belongs to the "reactions to uncertainty" dimension and refers to the physiotherapists' preference not to share their uncertainty with patients. Also noteworthy is question R14Q, which obtained a high score and refers to citing the patient more frequently in the face of uncertainty.

**Table 3.** Analysis of the variables of the TUP questionnaire.

Sources of uncertainty Items	Mean	SD
S1Q_INV. In many of the clinical decisions I make with my patients, I do not have all the information I need to make the right decisions.	1.81	0.833
S2Q. I prefer to address those pathologies that are familiar/known to me.	3.39	0.989
S3Q_INV. I find it more attractive to deal with a complicated case than with something simple	2.55	1.15
S4Q. I feel nervous or anxious when unsure of my patient's treatment, diagnosis or prognosis.	4.00	0.856
S5Q. If I am unsure about my patient's problem, I always encourage them to ask for further diagnostic tests.	3.68	1.08
S6Q_INV. Intuition plays an important role in my clinical decisions.	2.90	1.01
S7Q. I am relieved when the patient is referred to me with a definitive diagnosis and treatment plan.	2.68	0.748
Subjective nature of uncertainty **Items**		
I8Q. When unsure of a diagnosis or treatment, I imagine all sorts of negative scenarios: patient dies, patient sues, etc.	2.10	1.25
I9Q. Uncertainty means that I lack confidence in my knowledge and skills as a physiotherapist.	2.65	1.28
I10Q. When assessing a patient, a new and unexpected piece of information disturbs me.	2.71	0.824
I11Q. When a patient does not get better, it puzzles me and I find it hard to switch off mentally.	3.45	0.888
I12Q. I prefer not to treat patients who are colleagues or who are also healthcare professionals.	2.97	1.20
I13. Q I fear I could be sued for malpractice if I make a mistake.	2.97	1.20
Responses to uncertainty **Items**		
R14Q. When I am unsure of the effects of treatment, I ask the patient to call me or make an appointment as soon as possible.	3.32	0.979
R15Q_INV. I always share my doubts about diagnosis and treatment with my patients.	2.87	0.957
R16Q. I prefer not to let patients know I am unsure which treatments to use.	3.94	0.727
R17Q_INV. When unsure about a patient's problem, I always share it with fellow physiotherapists.	1.65	0.608
R18Q_INV. Sharing my uncertainty with my patients improves the relationship of trust.	2.77	1.02
R19Q. I may lose their trust if I share my doubts about a diagnosis or treatment with the patient.	3.26	0.965
R20Q_INV. When unsure of the diagnosis, I prefer to communicate it to the patient and refer them to another professional.	2.03	0.547

Regarding the items with the lowest scores, items I8Q, R17Q, I12Q, R20Q, and I10Q stand out, highlighting the "subjective influences of uncertainty" dimension, which integrates the three items with the lowest scores. Item I8Q (When I am uncertain about a diagnosis or treatment, I imagine all kinds of negative scenarios: the patient dies, the patient sues, etc.) obtained the lowest score in the TUP questionnaire and refers to harbouring catastrophic ideas in a situation of uncertainty. The question with the second-lowest score corresponds to item R17Q_INV (When I am unsure about a patient's problem, I always share it with other physiotherapist colleagues). Item

I12Q, which obtained the third-lowest score in the questionnaire, refers to the preference not to treat fellow professionals.

Correlation analysis of the TUP questionnaire variables

An analysis of the association between the items that make up the TUP questionnaire was carried out. A total of 33 statistically significant correlations were recorded among the study variables, as shown in Figure 1. Of these, 22 correlations were of the direct type and 11 were of the inverse type. The questionnaire's direct or positive correlation with the highest statistical significance (0.605, $p < 0.001$) is observed between items I11Q (When a patient does not improve, I am puzzled and find it difficult to disconnect mentally) and R14Q (When I am not sure of the effects of treatment, I ask the patient to call me, or I make an appointment as soon as possible). This correlation links the dimension "subjective influences of uncertainty" with the dimension "reactions to uncertainty". Of particular note is item S4Q (I tend to feel nervous or anxious when I am unsure of my patient's treatment, diagnosis, or prognosis), which establishes significant correlations with the variables I11Q (0.476, $p = 0.002$), I12Q (0.480, $p = 0.002$) and I13Q (0.417, $p = 0.007$), relating the dimension "sources of uncertainty" with the dimension "subjective influences of uncertainty". Other positive correlations that should be mentioned are those established between questions I13Q and R14Q (0.432, $p = 0.005$), and between questions S7Q and I11Q (0.411, $p = 0.008$).
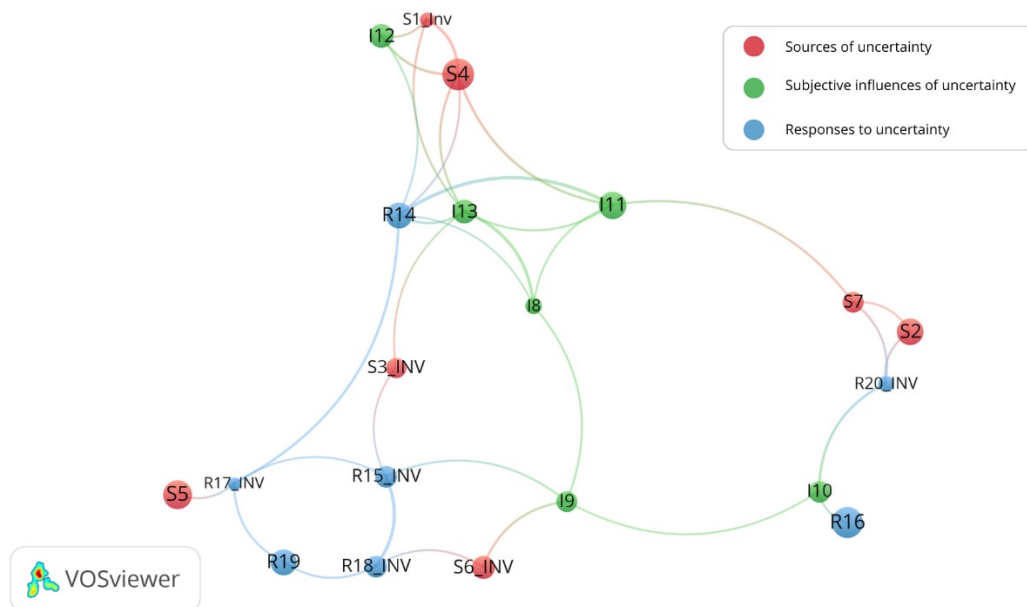
Figure 1. Correlations of the TUP questionnaire variables. The proximity of items on the lines indicates the strength of the correlation between them.

4. Discussion

This paper builds on previous research that explored UT in novice physiotherapists and identified their needs in terms of uncertainty management. One of the key findings of this research is that, considering the parameters of the TUP questionnaire, the results reflect a medium or medium-high UT of the physiotherapists evaluated. When compared with the results of the study carried out on novice physiotherapists, it can be seen that experienced physiotherapists obtained a significantly lower score in the TUP questionnaire (p-value < 0.001), and, therefore, a higher UT. It should be noted that, although there is an improvement in UT compared to novice physiotherapists, the results indicated that years of work experience are not a predictive factor of UT; however, since there is a negative correlation, it can be seen that, perhaps, the greater the duration of work experience, the greater the UT. This can be explained by the fact that certain aspects of the UT, especially those related to the subjective perception of uncertainty, improve over

time. However, other factors related to the source dimension of uncertainty, such as information treatment or the case's complexity, remain unchanged.

These findings reinforce the hypothesis that UT improves with experience and are consistent with the results found in previous studies. In the field of physiotherapy, Simmonds et al. (28) studied UT in a sample of 108 Canadian physiotherapists, finding that physiotherapists under 35 years of age had lower UT than physiotherapists over 35 years of age. Several studies in the medical field have found a correlation between uncertainty tolerance and years of experience. In a study conducted by Lawton et al. (16) on 92 emergency physicians with varying degrees of experience, it was concluded that physicians with more experience were less risk averse and more tolerant of uncertainty. For their part, Nevalainen et al. (17) found that doctors with more than five years of experience had higher UT compared with doctors who had less than five years of experience. Similarly, Han et al. (29) conducted a longitudinal study that assessed ambiguity tolerance in medical students and found a significant decrease in ambiguity aversion across years of study. Regarding the relationship between UT and gender, intolerance to uncertainty in females was significantly higher than in males, although it should be noted that the dispersion was also 3.13 points higher. Previous studies have reported mixed results in this regard, with some agreeing with the present article's results in which women show a higher intolerance to uncertainty (30), and others found no significant differences in gender (5). Notably, the assessed physiotherapists perceived more uncertainty in relation to the "sources of uncertainty" dimension. Sources of uncertainty refers to the ambiguity of information, the complexity of a clinical case, or the limitations of knowledge (2, 20, 31). In this regard, Ingram et al. (32) recently studied UT in primary care physiotherapists and related case complexity to UT, coinciding with the results of the present study.

Another key finding of the study is that the physiotherapists evaluated revealed the use of strategies to manage the uncertainty associated with low UT, such as requesting more tests when faced with the uncertainty of a diagnosis or showing a preference for not sharing their uncertainty with the patient. It has been noted in the literature that physicians with low UT tend to request more diagnostic testing (21, 33) which can lead to discomfort or discomfort for their patients, and higher healthcare expenditure (9, 34). Similarly, a preference for not sharing uncertainty with patients has been associated with low levels of UT (35). It can be argued that doctors have the perception that they should not show their doubts to their patients because it could be seen as a sign of incompetence, and therefore, they fear losing the patient's trust (2, 36). Conversely, they also use strategies considered adaptive, such as the use of support networks. Sharing uncertainty with other physiotherapists is considered an adaptive strategy for coping with uncertainty that helps to reduce the psychological stress of uncertainty (31, 37). In this context, Almond et al. (1) conducted a qualitative study with a sample of 17 novice physiotherapists in which they investigated how they managed uncertainty. Similar to our results, it was found that newly graduated physiotherapists rely on supportive environments, experienced colleagues, and trust networks to manage uncertainty.

The associations between the questionnaire items provide information about the behaviour of the physiotherapists in the face of uncertainty and allow us to establish a UT profile of the physiotherapists in the sample. In this way, we observed those physiotherapists who stated that they feel nervous or anxious when they are not sure about their patient's case (S4), have more difficulties disconnecting mentally (I11), prefer not to treat colleagues (I12), and are afraid of being denounced for malpractice (I13). To manage these situations of uncertainty, the physiotherapist makes more frequent appointments or asks the patient to call him/her as soon as possible (R14), probably to gain more control over the situation. Another way of reducing uncertainty and avoiding the bewilderment it generates would be to have a prior diagnosis and treatment plan (S7), and to avoid sharing their uncertainty with the patient (R16).

There is limited research comparing how young doctors and more experienced doctors deal with uncertainty (17), and this research gap is even more pronounced in physiotherapy. To the best of our knowledge, only the work of Simmonds et al. (28) has addressed this aspect in physiotherapists. The work presented here provides a UT profile of experienced physiotherapists who exhibit differences when compared with their novice colleagues. Thus, compared with the study on novice physiotherapists, experienced physiotherapists show less nervousness and anxiety about unfamiliar diagnoses, less catastrophic thinking, less difficulty in switching off mentally, and less avoidance with regard to treating colleagues. However, they also show similarities, especially regarding the ways in which they deal with uncertainty, where requesting more diagnostic tests and more frequent appointments are the most frequently used strategies. These findings raise the hypothesis that physiotherapists improve their UT with years of experience, but only in some aspects, while others remain unchanged. This may be due to the very nature of the uncertainty phenomenon, which is multidimensional and dynamic, presenting different mechanisms of action and management strategies (2). Few previous studies have investigated UT by analysing its different subtypes. However, our observations partially coincide with the research of Han et al. (29) on medical students in which they found improvements in ambiguity aversion, but not in the rest of the UT subtypes.

It is appropriate to point out the limitations of the present study that influence its interpretation. The sampling method used was convenience sampling, which is cost-effective and efficient for a wide distribution. However, the absence of incentives to participate often results in low response rates, so the sample size is not representative of the population. We only sampled the population resident on the island of Gran Canaria, so different results could be expected with physiotherapists from different parts of Spain. Convenience sampling allows quick and inexpensive access to the sample; however, the lack of incentives may penalise participation. It should be remembered that the TUP questionnaire is still in the optimisation phase, so the obtained scores should still be considered relevant. The focus was on identifying correlations between questions to determine the most valuable information. This approach enabled identifying aspects or situations that caused uncertainty for physiotherapists. Future research should select a more significant sample through the use of incentives to encourage participation, and remove or reformulate the TUP questionnaire items that contribute the least to achieve a higher degree of internal consistency.

In summary, the study provides a UT profile of physiotherapists who, despite having experience, present needs and limitations with regard to managing uncertainty that should be considered and addressed with training actions.

5. Conclusions

- Physiotherapists become more tolerant of uncertainty as they gain experience, but this increased tolerance is limited to certain aspects, while other areas remain unchanged. Specifically, their subjective perception of uncertainty improves over time. Still, factors related to the source of uncertainty, such as how information is handled or the case's complexity, do not change.
- Experienced and novice physiotherapists use strategies to manage uncertainty associated with low tolerance, exhibiting a preference for ordering more diagnostic tests and citing more frequently.
- Future physiotherapists must learn to perceive uncertainty as a natural part of their clinical practice and be encouraged to share it with their patients and the use of support networks.
- Implementing education programmes to improve tolerance to uncertainty in both undergraduate and postgraduate education is essential.

Conflict of interest: No potential conflict of interest relevant to this article was reported.

Institutional Review Board Statement: Ethical review and approval were waived for this study because it is a non-intervention study; it is a descriptive observational study. The method of data collection was through an online facilitated survey. It was mandatory to participate in the study first to accept informed consent voluntarily. The consent informed of the purpose of the study, guaranteed anonymity and confidential data treatment. In addition, an e-mail address was provided to resolve their doubts and exercise their rights to modify their data or renounce their participation.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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