# Evaluation of the Distress and Effects Caused By Nightmares: A Study of the Psychometric Properties of the Nightmare Distress Questionnaire and the Nightmare Effects Survey

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From a clinical perspective adequate instruments to assess the negative impact of stressful dreams and nightmares must be made available. The Nightmare Distress Questionnaire (NDQ) and the Nightmare Effects Survey (NES) are measures that focus on the emotional disturbance and interference caused by nightmares. The objective of this paper is to analyse the psychometric properties of the Spanish version of the NDQ and the NES. The study was carried out on a non-clinical sample composed of 162 university students aged between 18 and 38 years old. The participants completed the following questionnaires: the NDQ, the NES, a Sleep History Questionnaire, the Nightmare Frequency Questionnaire, the Beck's Anxiety Inventory and the Beck's Depression Inventory. The NDQ displayed a tri-factorial structure ("preoccupation-fear", "interference", and "premonition"), whilst the NES displayed a bifactorial structure ("specific effects" and "general effects"). The NDQ and the NES showed satisfactory levels of internal consistency (with Cronbach's alphas of 0.80 and 0.87, respectively). Both instruments significantly correlated with anxiety and depression measures. Subjects with a "high frequency of nights with nightmares/disturbing dreams" differed in the NDQ and the NES from those with "low frequency". In the NDQ the best discrimination value was the direct score of 12 (sensitivity=91.66% and specificity=74.71%), whilst in the NES this involved a direct score of 3 (sensitivity=75% and specificity=67.44%). The results of this study show that the NDQ and the NES are reliable and valid measures that successfully examine the repercussions of nightmares. We discuss the usefulness of the NDQ and the NES in evaluating nightmares within a clinical context. (Sleep and Hypnosis 2005;7(1):29-41)

Key words: Nightmares, NDQ, NES, distress, effects, frequency, psychometric properties

### INTRODUCTION

 $\mathbf{N}$  ightmares are extremely distressing dreams that usually interrupt the sleep of the

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person, bringing them to a state of total wakefulness in which they vividly remember the dream content. The themes of these dreams normally relate to threats to physical integrity (e.g., attacks) or self-esteem (e.g., personal failure), which may reflect real experiences or fictitious events. Nightmares usually occur in the second half of the night, when the REM (Rapid Eye Movement) phase is most prominent.

Nightmares may emerge as an independent

psychopathological problem as contemplated in nosologic systems (e.g., DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders -4th ed. rev.-, APA, 1). Whilst for some time the frequency of nightmare was erroneously related to general psychological disturbance, some studies in non-clinical populations (2,3) have established that there is no reliable link between nightmare frequency and psychopathology (for example, dysphoric moods such as anxiety and depression). However, sometimes nightmares do appear to be linked to other clinical conditions such as anxiety disorders, mood disorders, psychotic disorders, adaptation disorders and personality disorders. In certain cases the incidence of a large number of nightmares that produce high levels of distress may function as an indicator of pathological risk/severity and as a criterion for the demarcation of clinical typologies. For example, several studies have pointed out that the abrupt appearance of a high frequency of vivid nightmares may precede a psychotic episode (4,5). In relation to mood disorders, Ağargün et al. (6) reported that depressed patients with frequent nightmares were more prone to suicidal tendencies than patients who never experienced nightmares, and Bilici et al. (7) found that in patients with major depression, the level of dream anxiety can be used to differentiate cases with melancholic features and those without melancholic features

Post-traumatic stress disorder (PTSD) is probably the clinical condition that is most often associated with terrifying dreams. In fact, 60% of people suffering from this disorder experience nightmares (8). PTSD is usually accompanied by repetitive dreams of a stressful nature that involve the re-experiencing of the traumatic event suffered by the person, and therefore these dreams are considered as part of the diagnostic criteria of PTSD in the DSM-IV-TR. However, the nightmares that form a part of PTSD display different characteristics when compared with ordinary nightmares. For example, van der Kolk et al. (9) reported that Vietnam veterans with PTSD were more likely to state that their nightmares exactly or almost entirely replicated an actual event when compared with lifelong sufferers of nightmares with no combat experience. Furthermore, Woodward et al. (10) reported that in Vietnam combat veterans with PTSD, the subjects with trauma-related nightmares exhibited more wake-after-sleep-onset in the sleep laboratory subjects with non-trauma-related than nightmares. These results suggest that traumatic memories are somehow different from ordinary memories. Traumatic memory is a kind of intrusion in which the normal process of making and developing connections is disrupted (4).

Whilst the actual prevalence of nightmares has not been clearly established, they are not frequently experienced on a recurrent basis or to a disturbing extent by the general population, and it is estimated that only 1% of adults suffer from one or more of these types of dreams per week (ICSD, International Classification of Sleep Disorders, ASDA, 11). Nevertheless, experiencing distressing dreams on an occasional basis is common. Certain studies report a mean frequency of nightmares amongst students of around one per month (2,12). Such parasomnia is quite frequent amongst children, especially when they are subjected to psycho-social stress. According to the DSM-IV-TR, between 10% and 50% of children aged between 3 to 5 experience nightmares that are sufficiently intense to cause their parents concern. Disturbing dreams also affect the elderly. Frequent nightmares are reported by between 9% and 11.9% of elderly people, and the occurrence of these types of dreams is increased by somatic symptoms such as musculo-skeletal pain, restless legs and muscle cramps in the legs (13).

The consequences for the person suffering from this disorder are considerable, although these consequences relate more to subjective distress than to impairment within social or occupational spheres (1). Awakenings provoked by distressing dreams are accompanied by an intense and prolonged sensation of fear or anxiety. Moreover, the alteration of nocturnal rest due to continuous awakenings or the fear of sleeping caused by nightmares anticipation, is often associated with excessive somnolence, fatigue, difficulties in concentration, irritability, worry or feelings of helplessness, which may have a detrimental effect person's on the diurnal functioning.Certain recent studies present interesting data concerning the impact of nightmares on sleep, the emotional state and daily activities during wakefulness. Asplund (14) reported that, when compared to their counterparts who do not suffer nightmares, elderly people who suffer nightmares have a shorter sleep time to the first awakening, require more time to get back to sleep after nocturnal awakening, have a shorter maximum period of uninterrupted sleep period, and spend more total time in bed during the night. In a sample of students, Madrid et al. (15) found that those who experienced higher levels of distress as a result of nightmares exhibited more stress-related physical complaints (e.g., headaches and gastric discomfort) when compared with those suffering from lower levels of distress due to nightmares. Similarly, in a non-clinical sample whose members experienced approximately 2 nightmares per month, Köthe and Pietrowsky (16) observed that on those days when nightmares occurred, the subjects were more anxious, showed a less stable mental condition and reported more physical symptoms (in comparison with nightmare-free days). Furthermore, they reported that these effects were more accentuated in subjects with high levels of health concerns and neuroticism and low levels of optimism and achievement orientation.

In recent years we have witnessed an increase in the study of nightmares within the framework of a general panorama that is characterised by a resurgence of interest in the consciousness by the increased and contribution of neuro-physiological, psychophysiological and cognitive approaches to a scientific understanding of dreams (17-19). This stimulus to the area of nightmares research has materialised in the form of the incipient development of diverse measuring instruments and therapeutic programs (for a review see 20). Focusing on the area of evaluation, it should be pointed out that a large number of the measuring instruments are designed to assess dream recall and content, and those that examine distress or the effects of nightmares on daily functioning are scarce. If instruments focusing on the distress arising from and effects of nightmares were more widely available, this would allow us identify nightmares more efficiently, evaluate the magnitude of the problem and establish the changes produced by treatment. However, assessing the disturbance caused by the disorder is not merely relevant from a clinical point of view, but rather, represents an issue that should be addressed within basic research. For example, it has been suggested that the relationship between psychopathology and nightmares may be influenced to a greater extent by the distress provoked by the nightmares rather than their frequency per se (2,21). Therefore, if frequency and distress are not interchangeable variables, it is reasonable to assume that we will find divergent results amongst the studies that have used various nightmare characteristics as selection criteria for samples. For all these reasons, we feel that high quality measures must be made available in order to assess the degree to which the emotional distress and interference arising from nightmares act as mediating factors between nightmares and psychological disturbance.

The characteristics associated with nightmares can be delimited via the standardised assessment methods. Amongst the instruments that focus on the negative impact of stressful dreams the following stand out: the Nightmare Distress Questionnaire (NDQ, 22), which analyses emotional disturbance associated with these types of dreams; the Van Dream Anxiety Scale (VDAS, 23), which evaluates diverse aspects relating to dream anxiety and its consequences; and the Nightmare Effects Survey (NES, 24) which examines the areas of daily life that are affected by nightmares. The internal homogeneity, testretest reliability and validity of the VDAS have been analysed (23); however, until now, there have been no studies specifically aimed at examining the psychometric properties of the NDQ and the NES. Therefore, the objective of this study involves carrying out a preliminary analysis of the factorial structure, the reliability and the validity of the Spanish adaptations of the NDQ and NES in a non-clinical sample.

# METHODS

# Subjects

The sample was composed of 162 students (140 women, 16 men, and 6 subjects who did not identify their gender) from the Universities of Granada and Jaén (Spain). The ages within the group vary between 18 and 38 years of age (M= 21.15 years; SD=2.51). The subjects did not suffer from any current illness (neither physical nor mental) and had no history of alcoholism or substance abuse. With regards to the general characteristics of sleep, we can state that, on average, the subjects slept for 8.23 hours (SD = 0.97) per night, took 20.74 minutes (SD = 17.30) to get to sleep, and awoke 0.82 times during the night (SD = 0.98). In the event of waking during nocturnal sleep, they took an average of 10.77 minutes to go back to sleep (SD = 17.73), and their naps during the day lasted an average of 25.02 minutes (SD = 29.88). Sleep quality was defined as "excellent or satisfactory" by 37.9% of the participants, as "normal" by 46%, and as "poor or very poor" by 16.1%.

Although the ICSD does not contemplate nightmare frequency as a specific diagnostic

criteria, it does offer a classification of the condition of people suffering from nightmares by taking this parameter into account: the distinction between "mild" (less than one nightmare per week), "moderate" (more than one nightmare per week, but less than one every night) and "severe" (nightmares every night) frequency. In relation to the nightmares and disturbing dreams experienced by the participants, our study found that 12 of them reported a weekly frequency of nights with these types of dreams (range=1-3 nights; M=1.67; SD=0.65), whilst a related effect on daily functioning was reported in only two cases. Adhering to the ICSD classification, the condition of these subjects can be categorized as "moderate", and therefore we decided to consider this group as "sub-clinical". In contrast to those subjects with "a high frequency of nights with nightmares/disturbing dreams", 87 subjects reported an annual frequency of nights with these types of dreams (range=1-11 nights; M=3.70; SD=2.48). This group, with "a low frequency of nights with nightmares/disturbing dreams", was considered as the "non-clinical group." In this study the results corresponding frequency of "nights to the with nightmares/disturbing dreams" were equivalent to those relating to the frequency of "nightmares/disturbing dreams"; therefore, we decided to present only the results of the first index.

### Procedure and measures

Data was collected during the months of March, April and May, 2003, coinciding with a period of academic activity, but not with exams. This period was chosen in order to avoid any significant influence on the participants' sleep patterns arising from the academic evaluation phase. The participants were asked to collaborate voluntarily in a study that endeavoured to explore their opinions on sleep habits, emotional states and personality characteristics. Those who agreed to participate in the study did so anonymously and individually via completion of a notebook that included a number of different evaluation instruments. The questionnaires used in this study are indicated below.

Sleep History Questionnaire. This takes the form of a self-reporting instrument with a mixed format (structured and free), which was designed by the authors of this study in order to obtain socio-demographical data, and data on sleep habits, sleep quality, medical and psychological situations and significant stressful events experienced in the last 6 months.

Nightmare Frequency Questionnaire, NFQ (24). This instrument retrospectively identifies the annual, monthly and weekly frequency of nightmares/disturbing dreams and nights with nightmares/disturbing dreams. The test-retest reliability of the NFQ yields correlation coefficients and weighted kappas greater than 0.85 (24).

Nightmare Distress Questionnaire, NDQ (22). This measurement evaluates the emotional disturbance attributed to the nightmares via 13 items scored on a scale ranging between "never" (0) and "always" (4) (with the exception of 3 items wherein the content of alternative responses varied). The internal consistency of the NDQ varies between 0.83 and 0.88 (22).

Nightmare Effects Survey, NES (24). This instrument evaluates the extent to which nightmares interfere with different areas of a person's life (sleep, work, relationships, daytime energy, school, mood, sex life, diet, mental health, physical health and leisure activities) via 11 items scored on a scale that ranges between 0 ("not at all") and 4 ("a great deal"). The NES displays an internal consistency of 0.90 (24).

Beck's Anxiety Inventory, BAI (25). This instrument evaluates the intensity of anxiety symptoms. It consists of 21 items wherein the subject is asked to indicate the level of distress experienced during the previous week via a scale ranging between 0 ("not at all") and 3 ("severely, almost unbearable"). The Spanish adaptation of the BAI displays adequate internal consistency, content validity and criterion validity (26). In the present study we have used the Spanish adaptation detailed in Comeche et al. (27).

Beck's Depression Inventory, BDI (28). This instrument consists of 21 items (each with 4 states) that describe depressive symptoms. In each item the subject is asked to indicate the state that best describes their current condition. The items are scored from 0 to 3. Studies carried out on the Spanish population have shown that the BDI possesses adequate temporal stability, and convergent, discriminant and criterion validity (29). In the present study we have used the Spanish adaptation detailed in Comeche et al. (27).

In order to apply the NFQ, NDQ and NES in Spain, the questionnaires were translated into Spanish and subsequently translated back into English by a native speaker of English to insure that the meaning of the items had not been changed during the initial process of translation. The Spanish translations of these instruments are available from the first author upon request.

# Statistical analysis

In order to uncover the internal structure of the NDQ and the NES an exploratory factor analysis was carried out. Principal component analysis was chosen as the factorisation procedure because we wanted to focus our attention on explaining the total variance of the observed variables. Having assumed that the dimensions underlying each instrument correlate with one another, we resorted to oblique rotation (oblimin method). However, on finding a very limited association between dimensions in the NDQ, the data was reanalysed via orthogonal rotation (varimax method). In order to extract the number of factors, the Kaiser (30) criteria were applied based on the retention of those factors with

eigenvalues greater than or equal to 1. The subjects-variables ratio (12.46:1 for the NDQ; and 14.72:1 for the NES) surpassed the minimum acceptable values for factor analysis (31). The following criteria were applied for the purpose of purging the content of the dimensions: a) for each factor, items with saturations greater than or equal to 0.32 were chosen; and b) where items displayed significant saturations in more than one factor, the item was assigned to the factor with higher saturation, when the difference between saturations was greater than or equal to 0.25. The internal consistency of the NDQ and the NES (and of their respective subscales obtained through factor analysis) were examined via Cronbach's alpha. Pearson's correlation coefficient was used to determine the association between variables. All the preceding analyses were performed using the total sample (N=162). For the comparative analysis between subjects with "high frequency of nights with nightmares/disturbing dreams" (N=12) and those with "low frequency" (N=87), Mann-Whitney's U test was used, due to the fact that, as Bryman and Cramer (32) have indicated, non-parametric methodology is the most appropriate option when the sample size is less than 15. In addition, the sensitivity and specificity of the NDQ and the NES were calculated for different cut-off points.

Statistical analysis of the data was carried out via the SPSS 11.0 program for Windows. All the analyses were bi-tailed and probabilities less than or equal to 0.05 were taken as levels of signification.

# RESULTS

# Factorial structure

On the basis of the exploratory factor analysis (oblique rotation), the NDQ showed a tri-factorial internal composition which, taken as a whole, accounted for 54.56% of the variance. The first factor was composed of items 1, 2, 3, 11 and 12 (explained variance = 34.19%); the second factor by items 9 and 10 (explained variance=10.96%); and the third factor by items 5, 8 and 13 (explained variance=9.41%). The first factor showed a correlation of 0.18 with the second and of -0.27 with the third, and the second factor showed a correlation of -0.17 with the third. In view of these low correlations between dimensions, and with the aim of obtaining a factorial solution that would more clearly delimit the three possible isolated components, orthogonal rotation was applied. As was the case above, this analysis revealed a threecomponent structure. The only variations observed involved the incorporation of two items (items 4 and 7) with significant saturations, and redistribution of the variance percentage explained by each factor. In this structure the first component (items 1, 2, 3, 4, 11 and 12) explained the greater proportion of the variance (21.54%), and was composed of those contents that represent rumination, fear and a sensation of reality produced by nightmares, difficulty in getting back to sleep following a nightmare, and thoughts about seeking professional help as a result of this problem. The second component (items 5, 7, 8 and 13) accounted for 20.04% of the variance and was composed of contents concerning the interference of nightmares on well-being and sleep quality, the consideration of nightmares as problems, and interest in participating in therapy in order to control these disturbing dreams. The third component was composed of items 9 and 10 (explained variance=12.98%) and alludes to the premonitory character of nightmares. The saturations of this factorial structure are shown in Table 1.

The exploratory factor analysis (oblique rotation) of the NES revealed a bi-factorial structure that explained 56.80% of the variance. Items b, e, g and h formed part of the first factor (explained variance=46.83%), whilst items a, i and j formed part of the second factor (explained variance=9.97%). The first

Items	Factor 1	Factor 2	Factor 3
1. When you awaken from a nightmare, do you find you keep thinking about it and have difficulty putting it out of your mind?	<u>0.70</u>		
2. Do you ever find yourself avoiding or disliking or fearing someone because they were in your nightmare?	<u>0.58</u>		
3. Are you ever afraid to fall asleep for fear of having a nightmare?	<u>0.65</u>		
4. After you awaken from a nightmare, do you have difficulty falling back asleep?	<u>0.61</u>	0.35	
5. Do nightmares interfere with the quality of your sleep?	0.34	<u>0.67</u>	
6. Do you have difficulties coping with nightmares?	0.44	0.66	
7. Do you feel you have a problem with nightmares?	0.41	<u>0.66</u>	
8. Do nightmares affect your well-being?		<u>0.74</u>	
9. Do you ever have the feeling that something which happened in you nightmare has really occurred?			<u>0.86</u>
10. Do your nightmares foretell the future?			<u>0.83</u>
11. When you have a nightmare, does it ever seem so real that when you awaken you have difficulty convincing yourself it's "just a dream"?	<u>0.58</u>		
12. In the past year have you considered seeking professional help for your nightmares?	<u>0.48</u>		
13. If a therapy program were available which might help you control, or to stop having nightmares, how interested would you be in participating?		<u>0.59</u>	
Explained variance (%)	21.54	20.04	12.98

#### Table 1. Factorial structure of NDQ (orthogonal rotation).

Note: Underlined values represent the significant saturations selected in each factor.

component included specific facets of the person's life (work, academic activity, sexuality and diet), and the second component included aspects of a general nature relating to sleep and mental and physical health. A correlation of -0.54 was shown between each component. The saturations of this factorial structure are presented in Table 2.

Table 2. Factorial structure of NES (oblique rotation).

Items	Factor 1	Factor 2
a. Sleep adversely or negatively affected by nightmares.	0.43	<u>-0.80</u>
b. Work adversely or negatively affected by nightmares.	<u>0.77</u>	-0.47
c. Relationships adversely or negatively affected by nightmares.	0.68	-0.54
d. Daytime energy adversely or negatively affected by nightmares.	0.60	-0.67
e. School adversely or negatively affected by nightmares.	<u>0.82</u>	-0.41
f. Mood adversely or negatively affected by nightmares.	0.68	-0.68
g. Sex life adversely or negatively affected by nightmares.	<u>0.70</u>	-0.43
h. Diet adversely or negatively affected by nightmares.	<u>0.66</u>	
i. Mental health adversely or negatively affected by nightmares.	0.39	<u>-0.78</u>
j. Physical health adversely or negatively affected by nightmares.	0.35	<u>-0.77</u>
k. Leisure activities adversely or negatively affected by nightmares.	0.49	-0.69
Explained variance (%)	46.83	9.97

Note: Underlined values represent the significant saturations selected in each factor.

Reliability (internal consistency) and validity (of construct and of criterion)

The NDQ (total) displayed an internal consistency of 0.80. The item-total correlations ranged between 0.17 (item 12) and 0.63 (item 7). Items 12 ("In the past year have you considered seeking professional help for your nightmares?") and 13 ("If a therapy program were available which might help you control, or to stop having nightmares, how interested would you be in participating?") seem to contribute less to the global content of this scale, given that, when these elements are eliminated, there is a slight increase to Cronbach's alpha (up to 0.81 in both cases). The internal consistency of the factors obtained via orthogonal rotation was 0.72 for the first factor, 0.67 for the second and 0.70 for the third. In these components, we also observed that the suppression of items 12 and 13 improved the internal consistency (alpha=0.74 in factor 1; and alpha=0.73 in factor 2). The NES (total) displayed a Cronbach's alpha of 0.87. The item-total correlations ranged between 0.45 (item h) and 0.71 (item f). The internal consistency of factors 1 and 2 was 0.74 and 0.70, respectively. This data seems to indicate that both instruments possess a remarkable level of internal homogeneity.

There was a correlation of 0.57 (p<0.01) between the NDQ and the NES. We found significant correlation coefficients between

these measurements and the BAI and BDI (r between 0.31 and 0.40, p<0.01). This data shows that the distress and interference attributed to nightmares are positively related to dysphoric emotions. This information represents preliminary evidence in support of the convergent validity of the NDQ and the NES.

Those subjects experiencing a "high frequency of nights with nightmares/disturbing dreams" statistically differed from those with "low frequency" in the NDQ, the NES, and their respective subscales (see Table 3). These results indicate that both measurements possess divergent validity, as they enable us to distinguish between subject groups. The greatest differences in scoring between the two groups was observed in item 13 (interest in therapy) of the NDQ (M=2.00, SD=0.85, in the "high frequency" group; M=0.85, SD=0.98, in the "low frequency" group; U=207.50, p<0.005), and in item a (effects on sleep) of the NES (M=1.50, SD=1.24, in the "high frequency" group; M=0.37, SD=0.53, in the "low frequency" group; U=213.00, p<0.005). 25% of the "high frequency" subjects reported that their nightmares interfered with their sleep a lot/very much (in contrast to 0% of the "low frequency" participants), and were very interested in participating in some kind of therapy to eliminate these types of dreams (in contrast to 7.1% of the "low-frequency" subjects).

Variables	Total sample M (SD) n=162	Subjects with "high frequency"M (SD) N=12	Subjects with "low frequency"M (SD) N=87	U	
NDQ					
Total	10.78 (6.43)	16.67 (7.48)	8.67 (4.25)	158.00***	
"Preoccupation-fear"	5.55 (3.32)	7.58 (4.56)	4.55 (2.27)	283.50*	
"Interference"	2.95 (2.57)	5.08 (3.50)	2.28 (2.01)	220.00***	
"Premonition"	1.55 (1.61)	3.08 (2.06)	1.35 (1.42)	241.00***	
NES					
Total	3.21 (4.34)	7.25 (5.54)	2.08 (2.82)	203.00***	
"Specifics effects"	0.71 (1.53)	1.50 (1.73)	0.45 (0.97)	317.00**	
"General effects"	1.02 (1.45)	2.58 (2.53)	0.62 (1.02)	240.00***	

Table 3. Means (and standard deviations) on NDQ and NES obtained by the total sample and the two groups established in function of frequency of nights with nightmares/disturbing dreams.

Note: \*p<0.05; \*\*p<0.01; \*\*\*p<0.005.

The sensitivity and specificity of the NDQ and the NES are shown in Table 4. Sensitivity and specificity values were calculated in accordance with the diverse direct scores in these instruments for the "sub-clinical" group ("high frequency of nights with nightmares/disturbing dreams") and for the "non-clinical" group ("low frequency of nights with nightmares/disturbing dreams"). The optimum cut-off point was established by combining maximum sensitivity and specificity. In the NDQ the best discrimination value corresponded to a direct score of 12: 91.66% of the subjects with "high frequency of nights with nightmares/disturbing dreams" and 74.71% of the "low frequency" subjects were correctly identified. In the case of the NES, the optimum discrimination criteria corresponded to a direct score of 3, which enabled the correct identification of 75% of the subjects with "high frequency of nights with nightmares/disturbing dreams" and 67.44% of the "low frequency" subjects.

within this sample was labelled as "sub-clinical" due to the fact that they experienced nightmares/disturbing dreams on a weekly frequency. The general sample reported a mean frequency of nights with these kinds of dreams of 3.70 in the previous year, the NDQ showed a mean score of 10.78 (SD=6.43), and 7.40% of the sample belonged to the "sub-clinical" group. This data reflects a frequency that is slightly lower than those reported in several previous studies. For example, in a study carried out by Belicki (2), 85 students taking an introductory Psychology course reported a mean frequency of nightmares of 10.5 in the previous year and obtained a mean score of 32.3 (SD=10.5) in the NDQ. Schredl (33), in a sample of 444 Psychology students, observed that 12.10% of them experienced nightmares at least once a week. Nevertheless, in general terms, our findings are in keeping with data reported in literature referring to similar samples. It has been shown that in undergraduates, the mean frequency of

 Table 4. Sensitivity and specificity of NDQ and NES considering several cut points.

NDQ			NES		
Direct score	Sensitivity %	Specificity %	Direct score	Sensitivity %	Specificity %
9	91.66	54.02	2	83.33	58.13
10	91.66	62.06	3	75	67.44
11	91.66	67.81	4	66.66	75.58
12	91.66	74.71	5	58.33	83.72
13	66.66	83.90	6	50	88.37
14	58.33	89.65	7	50	90.69

### DISCUSSION

This study presents empirical evidence relating to the internal structure, reliability and validity of the NDQ and the NES, instruments that allow us to evaluate the emotional distress and deterioration stemming from nightmares in diverse areas of life. These aspects are included amongst the diagnostic criteria of this clinical condition in the DSM-IV-TR.

The study was carried out on a sample of university students with no psychological problems, although a small group of subjects nightmares ranges between 5 and 10 per year (34, 35, 36), and that between 2% and 6% of these subjects suffer one, or more than one nightmare per week (36,37,38,39).

Establishing comparative data on nightmare frequency is a complicated task, given that the results vary considerably depending on the methodology that is employed (self-reporting questionnaires vs. sleep diaries). For example, in a sample of 220 undergraduates, Wood and Bootzin (3) observed a mean annual nightmare frequency of 9.36 when using retrospective methodology, whereas when prospective methodology was used, this figure ascended to 23.6. Whilst the use of sleep diaries usually results in a higher number of reported nightmares, further investigation must be carried out in order to clarify whether or not these differences are due to underestimation of nightmares during retrospective evaluation or overestimation during prospective evaluation as a consequence of the deliberate focal attention placed on the dreams (33).

Moreover, we want to draw attention to the fact that this study simultaneously evaluates the presence of both nightmares and disturbing The difference between dreams. each phenomenon has not been clearly established, although "awakening" as a result of the extreme intensity of the emotions provoked by the dream is usually found amongst the criteria that are used to differentiate each phenomenon. According to Halliday (40), disturbing dreams that waken the person must be called "nightmares", whilst those that do not awaken the subject should be labelled as "bad dreams". In this sense, awakening can be considered as an indication of the emotional intensity provoked by the dream. However, in the opinion of Zadra and Donderi (41), this is not necessarily the case, and they cite the following objections: 1) even the most unpleasant dreams do not necessarily cause the person to waken (e.g., 42); 2) amongst patients experiencing chronic nightmares, less than a quarter report that they always wake up as a result of these types of dreams (e.g., 43); and 3) amongst subjects who experience both bad dreams and nightmares, approximately 45% of bad dreams provoke emotions that are just as intense or more intense than those provoked by nightmares (e.g., 44). Whilst criteria used to differentiate bad dreams and nightmares can prove helpful, the fact is that in studies focusing exclusively on subjects suffering from nightmares different results are obtained in comparison with studies that focus on subjects experiencing both nightmares and disturbing dreams. This observation is in accordance with

the study carried out by Zadra and Donderi (41), who observed that nightmare frequency correlated more strongly with diverse measurements of well-being (e.g., anxiety, depression) than bad dreams, which led them to conclude that the former constitute a more severe expression of the same basic phenomenon.

Having considered the characteristics of our sample, we now turn our attention to the most relevant results that were obtained. In relation to the internal structure of the NDQ, it must be pointed out that the distress attributable to nightmares can be broken down into three factors. Considering the two most significant elements, we can state that the first factor ("preoccupation-fear") is mainly composed of aspects relating to recurrent thoughts about anxiety dreams, and fear of going to sleep; the second factor ("interference") is made up of elements that, for the most part, relate to the negative influence of the nightmares on wellbeing and sleep quality; and the third factor ("premonition") includes contents that refer to the portentous character of the dreams. In the case of the NES, the two dimensions that were identified correspond to "specific" and "general" aspects of effects.

The internal consistency analysis results for the NDQ and the NES are good for the global scales (alpha 0.80 and 0.87, respectively) and acceptable for the various subscales. Thus, we can conclude that thev are reliable measurements of distress attributable to nightmares and of the effects of nightmares. The results of our study coincide with the results of previous reports. In a study carried out by Belicki (22) involving various samples of undergraduate students, the internal consistency of the NDQ varied between 0.83 and 0.88. Krakow et al. (24) reported that the internal consistency of the NES reached a value of 0.90 in a sample of patients with posttraumatic stress disorder.

One significant question mark in relation to the NDQ involves the problems arising from items 12 and 13 (both relate to the seeking of professional help for the problem of nightmares). These elements present the lowest significant saturations, which indicates a meagre contribution to the respective factors in which they are included. Moreover, the fact that the two items form part of different components means that they are somewhat unspecific and of little discriminative value. In addition, according to the internal consistency analysis, these items reduce the homogeneity of the content of the subscales. In view of the issues outlined above, it would be interesting to reformulate these items in order to obtain a more precise configuration of the dimensions of this instrument.

In terms of convergent validity, our results were satisfactory, as shown by the level of association between the NDQ and the NES (r =0.57), instruments that measure constructs that are to a certain extent equivalents. Our data is in keeping with the data obtained in other studies, such as the research carried out by Belicki et al. (12) wherein the correlations between the NES and the NDQ varied between r=0.54 and r=0.70. Additional information relating to convergent validity revealed the link between these measures and negative emotionality variables (anxiety and depression). We think that the partial relationship between the NDQ and the BAI/BDI may indicate that this nightmare index is a specific measure that captures distress specifically related to nightmares that is not identified by measures of general distress.

The subject groups that were established on the basis of the frequency of nights with nightmares/disturbing dreams ("high" vs. "low") differed in the degree of distress attributed to these dreams and in the effects that these dreams had on various aspects of everyday life. More specifically, the most notable differences between the two groups refer to interest in therapy and sleep perturbation, where the high frequency subjects obtained the highest scores. The capacity of the NDQ and the NES to differentiate between each group of subjects reflects their divergent validity.

In terms of criterion validity, both the NDQ and the NES showed an acceptable level of sensitivity and specificity, with values of 12 (for the NDQ) and 3 (for the NES) for optimum cutoff points that delimit those states approaching morbidity. However, these markers must be considered with prudence, given that the data relating to sensitivity has been extracted from a small and "sub-clinical" sample.

To examine the divergent validity, sensitivity and specificity of NDQ and NES we have established the groups in accordance with nightmare frequency (ICSD criteria). However, we recognise that other criteria may have proved equally or more appropriate. As several previously mentioned studies report (2,21), psychopathology is more closely linked to the distress occasioned by nightmares rather than their frequency. In addition, it has been reported that nightmare distress correlates more highly with interest in therapy than nightmare frequency (22). Taking this data into account we think that it would be interesting for future research to analyse whether or not the NDQ and the NES are able to distinguish between people who actually seek help for nightmares (a clinical sample) and non-clinical samples composed of subjects that are not undergoing treatment.

In conclusion, on the basis of the findings of our study, the NDQ and the NES constitute reliable and valid measures for the evaluation of the repercussions of nightmares. However, we feel that additional studies on clinical samples are necessary in order to corroborate our findings and examine other forms of reliability (e.g., test-retest) and validity (e.g., predictive power with regard to therapeutic efficacy).

We did not want to conclude the work without emphasising the extreme importance, from an applied point of view, of the identification of the distress provoked by nightmares, and in particular, of the evaluation that a person makes of these experiences, such as rumination about the content and meaning of their dreams, or the belief that they are uncontrollable. Possibly this factor, rather than nightmare occurrence in and of itself, is the key to explaining the negative impact of these types of dreams. Indeed, Hill and Belicki (45) (cited in 2) carried out a study on people who experienced many nightmares but suffered from different degrees of distress, and found that those who reported higher levels of distress had difficulty in distracting their attention away from memories of the nightmares, focused their attention on this kind of dreams, considered their nightmares to be more serious and gave them greater importance, and were therefore less likely to evaluate them as mere dreams. Along the same lines, Levin and Fireman (21) have pointed out that the way in which an individual perceives his/her dreams is influenced by a combination of conditioned expectances and intra-individual stable variations in their ability to confront awakening, strategies of emotional regulation, and degree of sensitivity to threats from the

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environment. According to these authors, those subjects who experienced a higher degree of distress due to nightmares displayed hypervigilant perceptual threat schemas, which would produce a selective processing of negative emotional stimuli, and a subsequent increase in remembering threat related material. Bearing in mind that in the majority of cases the problem of disturbing dreams is not attributable to a traumatic origin, but rather, is related to stressful quotidian events, the negative evaluation that a person makes of their dreams might become an additional stress factor that increases the future probability of having additional experiences of this kind. This is in accordance with the theory put forward by Hartmann (4) which states that the process of hyper-connectivity between previous memory traces that occur in dreams is guided by the dreamer's dominant emotions, and by certain empirical studies (e.g., 46), which suggest that the efficacy of imagery rehearsal therapy in the treatment of nightmares is related to the restructuring of the distorted beliefs that the individual has about his/her own dreams.

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