Nightmares and Stress in Children

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Objective: Whereas the effect of stress on nightmare frequency is well-documented in adults, research on this topic in children is scarce. In addition, these studies are often based on data obtained from the parents which may not be valid with regard to nightmare frequency and subjective stress levels.

Method: 95 school children (fifth grade; age range: 9 to 11 years) completed a questionnaire about the occurrence of stressors, their subjective stress level and nightmare frequency.

Results: The findings indicate that interindividual differences in nightmare frequency were explained by social stressors like quarreling with a sibling, death of a close person and chronic illness of a close person.

Conclusions: The next step will be a longitudinal study measuring the occurrence of stressors as well as personality dimensions and the occurrence of nightmares and their content by applying diaries and self-rated scales together with information obtained from the parents. **(Sleep and Hypnosis 2008;10(1):19-25)**

Key words: nightmares, children, stress

INTRODUCTION

Nightmares are defined as dreams with strong negative emotions which awaken the dreamer (1) and are common during childhood; 70 to 90% of young adults reported that they experienced nightmares at some time during their childhood (2). The frequency of children suffering from nightmares (sometimes operationalized as a nightmare frequency of once a week or more) is estimated as being as much as 5% (overview: [3]), especially in the age range from 6 to 10 whereas recent epidemiological studies indicate a lower prevalence rate in pre-school children (4). In the etiology of nightmares an interaction between disposition (genetic factors; [5]; personality; [6]; trait anxiety, [7]) and acute stressors [8] and trauma (kidnapping: [9,10]; war experiences: [11]; natural disasters: [12]; severe burns: [13]) can be found.

In comparison to studies in adults (overview: [8]), research on the relationship between everyday stress and nightmare frequency in children is scarce. Several case reports and parental surveys (e.g., [14,15]) indicate that family stress or other "normal" stressors can promote the occurrence of nightmares. Whereas one controlled study (16) found no relationship between everyday stress and nightmare frequency, Schredl et al. (17) reported small but significant

correlations between school problems (r=.155, p<.01, N = 300), the occurrence of stressors (divorce of the parents, accident, death of a close person; r=.123, p<.05, N=300) and nightmare frequency. Similarly, Kraenz et al. (18) also showed a small but significant correlation between family stress and the occurrence of nightmares. Both positive studies were based on questionnaire data obtained from the children's parents. Mindell & Barrett (7), for example, demonstrated that the relationship between trait anxiety and nightmare frequency was only present in the data reported by the children but not in the data reported by the parents. In a similar way, one might hypothesize that the non-significant or very small correlation coefficients of the previous studies are due to this methodological issue and that for measuring stress it might be more accurate to use ratings made by the children themselves. In the case of nightmares, parents often underestimate the frequency compared to the child's estimate (19,20).

The present study investigated the relationship between different kinds of stressors (school, social, and death of a close person) and nightmare frequency in school-aged children by eliciting stress levels and nightmare frequency from the children directly. It was predicted that the occurrence of stress is positively related to nightmare frequency.

METHOD

Participants

Overall, 95 children (fifth grade) participated in the present study. Because of time constraints it was not possible to collect written consent from all the parents, so the response rate was about 63.3%. The mean age of the total sample was 10.4±0.6 years (range: 9 to 11 years). The mean ages of the girls (N=62) and boys (N=32) did not differ significantly (10.4±0.57 [girls] vs. 10.4±0.7 [boys], t=-0.4, p=.6999). One child omitted answering the gender item.

Materials
Child questionnaire

For the purpose of the study, a questionnaire for children was developed. In order to reach the children, a comic dragon (his name is "Knut") was introduced. First, he "informs" the child about the confidentiality of the questionnaire. Then, the child's age and sex were elicited. Second, "Knut" explains that this is not an exam and also the format of the scales (four-point formats with smileys: 0 = ☺ 1 = 😐 2 = 🙁 3 = 🙁). Then, dream recall was measured by a seven-point scale (0 = never to 6 = every morning). The scale has high retest reliability (r = .85, interval: 55 days, N = 198; [21]). A similar scale format was used to elicit nightmare frequency. Prior to the nightmare items, "Knut" explains what nightmares are (bad dreams which cause waking up and with good recall). This was introduced to differentiate nightmares from night terrors which are poorly recalled (22).

For the 17 stress items, "Knut" explained what stress means, i.e., feeling tense, anxious, irritated, overwhelmed, lack of concentration). Two types of items were constructed. First, four-point Likert rating scales with smileys (0 = no stress, 1 = minor stress, 2 = moderate stress, 3 = a lot of stress) were presented for the following topics "Doing homework", "Attending the school", "Writing exams", "Being called up during classes", "Transition from 'Grundschule' to 'Gymnasium'" (in Germany there is an obligatory transition after the fourth grade to another school). The second type of items first elicited whether a specific stressor had occurred during the last weeks and if so, the child was asked to rate the amount of stress on the four-point smiley scale. The topics were "low grades", "hearing bad talk about oneself", "being excluded from groups", "quarreling with a friend", "quarreling with parents", "quarreling with siblings", "quarrels between the parents", "moving to

another city", "suffering from a chronic disease like neurodermatits", "a close person suffering from a chronic disease", "death of a close person", and "separation of the parents". Lastly, "Knut" thanks the child for filling out the questionnaire, reminds her/him to check whether a question was left unanswered and promises a small reward (sweets).

Two averages have been computed: "school stress" and "social stress". The "school stress" score included "Low grades", "Doing homework", "Attending the school", "Writing exams", "Being call up during classes", and "Transition from 'Grundschule' to 'Gymnasium'". The "social stress" scale encompassed the items: "hearing bad talk about oneself", "being excluded from groups", "quarreling with a friend", "quarreling with parents", "quarreling with siblings", "quarrels between the parents", and "separation of the parents". In order to compute averages, the items were transformed, i.e., a non-occurring stressor was transformed into a zero for the stress level scale.

Design and Procedure

In the "Gymnasium" type of school, children of the 5th class filled in the questionnaire in the classroom and this was supervised by one of the experimenters. Due to time constraints, it was not possible to obtain written permissions from all the parents. Parents actively rejecting participation for their child were not reported so that the reduction of sample size is probably unrelated to systematic biases. The children were told that they will be offered a small reward (sweets) for participation.

The questionnaire data were coded and analyzed with the SAS for Windows 8.02 statistical software package. The nightmare frequency scale was analyzed by non-parametrical methods (Mann-Whitney-U test) and Spearman Rank correlations were computed. One-tailed tests were applied for the relationship between stress and nightmare frequency.

RESULTS

Nightmare frequency

Thirty-nine percent of the sample reported that they did not have nightmares in the last few weeks whereas 42% reported occasional nightmares and 19% experienced nightmares once a week or more often. Nightmare frequency did not differ between the sexes (1.69±1.53 [girls] vs. 1.38±1.77 [boys], z= -1.0, p= .3159). For dream recall frequency, a significant gender difference was found (3.58±1.91 [girls] vs. 2.94±2.02 [boys], z= -1.7, p= .0465, one-tailed). The correlation between nightmare frequency and dream recall frequency was r= .317 (p= .0017).

Waking stressors and stress levels

The means and standard deviations of the "school stress" variables are depicted in Table 1. On average, school stress is rated as minor stress, most intense ratings being found for "writing exams" and – if present – for receiving low grades. The social stress average is lower than the averaged school stress level, mainly due to the low occurrence rates of the single stressors because the non-occurrence of a stressor was coded as zero (see Table 2). The most intensely stressful events were "quarreling with parents", "hearing bad talk about oneself", "quarreling with a friend", and "quarrels between the parents". The stressor that occurred most often was "quarreling with siblings" which was rated as minor stress on average. Of the other stressors elicited in this study, death of a close person was reported most often (see Table 3). This was also the stressor rated as most stressful of all elicited stressors. "Moving to a new city", "suffering from a chronic disease", and "a close person suffering from a chronic disease" were reported less often and associated on average with minor stress.

Table 1. Nightmare frequency and "school" stress variables (Means ± SD or frequencies, respectively)

Variable	Occurrence	Stress level	Correlation NF[1]	Correlation DRF[1]
"School stress" score	100%	0.89 ± 0.54 (N = 95)	.061	-.024
"Low grades"[1]	37.9%	1.67 ± 0.76 (N = 36)	.125	.025
"Doing homework"	100%	1.06 ± 0.76 (N = 95)	.149	-.028
"Attending the school"	100%	0.83 ± 0.93 (N = 95)	.080	-.091
"Writing exams"	100%	1.33 ± 0.89 (N = 95)	-.129	.030
"Being called up during classes"	100%	0.41 ± 0.56 (N = 95)	.051	.019
"Transition of school type"	100%	1.09 ± 0.86 (N = 94)	.029	.078

*p < .05, **p < .01, NF= Nightmare frequency, DRF= Dream recall frequency
[1]Correlations between the binary variable and NF or DRF, respectively, were computed.

Table 2. Nightmare frequency and "social stress" variables (Means ± SD or frequencies, respectively)

Variable	Occurrence	Stress level	Correlation NF[1]	Correlation DRF[1]
"Social stress" score	100%	0.38 ± 0.34 (N = 95)	.211 *	.009
"hearing bad talk about oneself" [1]	37.9%	1.67 ± 0.80 (N = 21)	.095	.103
"being excluded from groups" [1]	15.8%	0.93 ± 0.88 (N = 15)	.045	-.095
"quarreling with a friend" [1]	33.7%	1.59 ± 0.84 (N = 32)	-.029	.127
"quarreling with parents" [1]	33.7%	1.78 ± 0.87 (N = 32)	.066	-.100
"quarreling with siblings" [1]	54.8%	1.08 ± 0.99 (N = 50)	.191 *	.168
"quarrels between parents" [1]	15.8%	1.60 ± 0.91 (N = 15)	.150	.116
"separation of the parents" [1]	14.7%	1.21 ± 1.12 (N = 14)	.028	-.164

*p < .05, **p < .01, NF= Nightmare frequency, DRF= Dream recall frequency
[1]Correlations between the binary variable and NF respective DRF were computed.

Table 3. Nightmare frequency and other stressors (Means ± SD respective frequencies)

Variable	Occurrence	Stress level	Correlation NF[1]	Correlation DRF[1]
"Moving to a new city" [1]	17.9%	1.06 ± 0.80 (N = 18)	.029	.121
"suffering from a chronic disease" [1]	12.6%	0.75 ± 0.45 (N = 12)	.128	.058
"a close person suffering from a chronic disease" [1]	24.2%	1.09 ± 0.79 (N = 23)	.287 **	.268 **
"death of a close person" [1]	65.3%	2.22 ± 0.74 (N = 60)	.278 **	.281 **

*p < .05, **p < .01, NF= Nightmare frequency, DRF= Dream recall frequency
[1]Correlations between the binary variable and NF or DRF, respectively, were computed.

Correlations to nightmare frequency

None of the school stress variables were related to nightmare frequency (see Table 1). Similarly, dream recall frequency was not associated with the school stressor variables. The average social stress level was positively correlated with nightmare frequency but not with dream recall frequency (see Table 2). The stressor with the highest correlation was the occurrence of quarrels with siblings. Of the other stressors, the occurrence of the death of a close person and the presence of a chronic disease in a close person was associated with heightened nightmare frequency. Since dream recall was also related to both variables, partial correlations have been computed in order to rule out the possibility that the stressor-nightmare relationship is explained by heightened dream recall. Both partial correlations coefficients remained significant (death of a

close person: r= .207, p<.05; chronic illness of a close person: r= .221, p <.05)

DISCUSSION

The present study demonstrated a link between the amount of stress and nightmare frequency. Especially social stress and stress associated with the death or a chronic disease were associated with heightened nightmare frequency. This relationship cannot explained by heightened dream recall since partial correlations remained significant. To evalute the findings, one has to keep in mind that the study's design only allows us to associate interindividual differences in stress level with interindividual differences in nightmare frequency; an approach which might have reduced the correlation coefficients due to averaging over a period of a few weeks. To measure the association directly, future studies should elicit the occurrence of nightmares and stressors on a day-to-day basis in a longitudinal design. Another approach will be to increase the duration of the study period, so one might expect major stressful events which have a strong influence on nightmare frequency more often.

The findings of this study were based on children's estimates (nightmare frequency, occurrence of stressors and stress levels), so this might explain the difference with the non-significant findings of King et al. (16) and the very small correlation coefficients reported by Schredl et al. (17). In order to estimate the effect of this methodological issue (child questionnaire vs parents questionnaire) on the correlation between nightmare frequency and stress, it would be desirable to conduct studies including both types of measures. It has been shown in a large sample (N= 4834) that children's estimates of nightmare frequency and daytime stressors are highly correlated with the parents' estimates (23); data indicating the validity of the present findings. That this study replicated the well-documented gender difference in dream recall frequency (cf. [24]) supports again the validity of the findings.

School stress was not associated with nightmare frequency; a finding which might be explained by the data regarding nightmare content. Two studies (25, 26) showed that school topics occur very rarely in children's bad dreams. On the other hand, dream content related to death or injury of another person (most often parents or siblings) was present in about 20% of the bad dreams reported by adolescents (10 to 16 yrs., [27]). This might explain the finding regarding the effect of social stressors (quarreling with siblings, death of a close person or a chronic illness of a close person) on nightmare frequency. Although Garfield (25) postulated for a list of nightmare themes possible waking-life stressors (e.g., getting lost in the dream might reflect the feeling of being lonely in waking life) and Terr (15) reported an association between death dreams and the occurrence of a traumatic event, empirical research in this area is lacking. I.e., future studies which elicit nightmare content in addition to nightmare frequency can determine whether specific stressors are associated with specific nightmare topics.

A methodological issues to be considered is a possible influence by response bias (i.e., the child answers all items positively or all items negatively) because all items were positively keyed. This would, however, yielded small positive correlation coeffecients between nightmare frequency and all stress variables. The specific correlation pattern found in this study cannot be attributed to a response bias.

This finding that stress is associated with nightmare frequency and previous studies documenting the role of trait factors (see introduction) corroborate the model which postulates that disposition and stress are important in the etiology of nightmares (see also [4]). In future studies it will be interesting to measure the occurrence of stress and personality dimensions like neuroticism and

thin boundaries simultaneously in order to test whether the amout of stress may function as an mediator between trait factors and nightmare frequency; a relationship which was reported by Schredl (8) in an adult sample.

Interestingly, it has been reported that a simple method (Imagery Rehearsal Therapy (IRT); [28]) is available for treating nightmares effectively even though this treatment strategy does not aim at coping with waking-life stressors and – of course- does not change disposition. Based on our findings, children after the loss of a close person or with a relative suffering from chronic disease might benefit from this intervention. Despite the published case reports (e.g., [29]), no controlled randomized trails with IRT has been carried out in children as has been done in adults (e.g., [28]). This brief intervention (one to three sessions) is so effective because one of the important factors maintaining the occurrence of nightmares is avoidance (like reported for other anxiety disorders like phobias; [1]); avoiding the confrontation with the dream situation is very easily done with the statement "It was just a dream."; which is, for example, a common reaction in adolescents (27).

To summarize, the occurrence of stress is related to heightenend nightmare frequency in children and future studies with longitudinal designs and including personality measures as well will shed more light on the interaction between disposition and stress in the etiology of nightmares. To children who suffer from nightmares, a specific treatment (Imagery Rehearsal Therapy) should be offered.

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