RESEARCH ARTICLE

# Nocturnal enuresis in children: Parents' perspectives

Wen-Jiao Huang[1]   |   Yuan-Yuan Liang[2]   |   Qian Yang[2]   |   Xue Ma[2]

[1]West China School of Nursing/
Department of Pediatric Surgery, Sichuan
University, Chengdu, China

[2]Department of Pediatric Surgery, West
China Hospital, Sichuan University,
Chengdu, China

**Correspondence**
Xue Ma, Department of Pediatric Surgery,
West China Hospital, Sichuan University,
No.37 Guoxue Alley, Wuhou District,
Chengdu City, Sichuan Province, China.
Email: immaxue@163.com

## Abstract

**Aim:** Parents of children with nocturnal enuresis (NE) may have uncertainty and anxiety. This study aimed to investigate the level of uncertainty and anxiety in the parents of children with NE and analyse its influencing factors.

**Design:** We conducted a descriptive cross-sectional study among the parents of children with NE in China.

**Methods:** A general information questionnaire, the Parent Perception of Uncertainty Scale (PPUS), and the Self-Rating Anxiety Scale (SAS) were used. Multiple linear regression analysis was used to identify factors influencing the parental uncertainty level independently.

**Results:** A total of 247 valid questionnaires were collected. The PPUS score of children with NE was $81.18 \pm 10.82$, and the anxiety self-rating scale score was $41.86 \pm 9.20$. Parents' working status, the family's per capita monthly income, and the children's treatment time were the main influencing factors of parental illness uncertainty.

**KEYWORDS**
anxiety, children, long-term care, mental health, nocturnal enuresis, parents, uncertainty in illness

## 1 | INTRODUCTION

Childhood nocturnal enuresis (NE) is a common childhood disease. According to the International Children's Continence Society (ICCS) (Shah et al., 2018), NE is defined as intermittent urinary incontinence occurring at least twice a week during sleep over a period of more than 3 months in children at a minimum age of 5 years (Gomez Rincon, Leslie, & Lotfollahzadeh, 2020). It has been reported that the incidence rate of NE is 10% for children under 7 years old, 3.1% for children aged 11–12 years and 0.5%–1.7% for children aged 16–17 years (Kuwertz-Bröking & von Gontard, 2018; Y. Li et al., 2019). In China, the prevalence of NE varies by region, ranging from 4.07%–10.3% (Han et al., 2019; Miao & J., 2020; Wang et al., 2019), and it occurs more frequently in boys (Sarici et al., 2016). NE affects the social life of a child, and according to a survey, children with

enuresis described bedwetting as the third most disruptive to their lives ranked only after divorce and parental conflict (Tai, Tai, Chang, & Huang, 2021). Although the disease does not cause acute harm to children, long-term nocturnal bed-wetting often begets a serious disease burden and psychological pressure on both children and their parents (Salehi, Yousefichaijan, Rafeei, & Mostajeran, 2016), resulting in anxiety and feelings of uncertainty (Jönson Ring, Nevéus, Markström, Arnrup, & Bazargani, 2017; Sinha & Raut, 2016).

Uncertainty in illness refers to the lack of the ability to judge events related to or predict the prognosis of the disease (Kerr & Haas, 2014). Parents' uncertainty with regard to a specific illness stems from their desire to envision their child's future (Santacroce, 2001). In cases when parents feel uncertain about the severity of the disease and the unpredictability of the future during the diagnosis stage of disease, the uncertainty typically intensifies further. This trend is

commonly observed in many patients and their family members (Hagen et al., 2015; MH, 1988). Illness uncertainty may make parents more inclined to adopt negative coping styles and behaviours and consequently affect the quality of life and the rehabilitation of paediatric patients (Jönson Ring et al., 2017; Yang et al., 2015).

## 2 | BACKGROUND

When their child is diagnosed with NE, parents experience considerable stressful events and are haunted by disbelief and emotional distress (e.g. anxiety and depression). Society and parents commonly expect children to achieve urinary continence by age six. This expectation increases as children age (Linde et al., 2021; Maternik, 2019). Many parents also rarely see substantial or sustained improvement in their children's bedwetting problem, leading to frustration and ambivalence (Tai, Tai, Chang, & Huang, 2017). Chang et al. found that children with NE struggled more academically and socially, and their parents experienced and exhibited more parenting stress (Chang, Ng, & Wong, 2002). Hamed et al. mentioned that parental perceptions, attitudes and responses to illness affect the development of children's diseases. Positive expectations in parents have similarly been associated with better health outcomes (Hamed, Fawzy, & Hamed, 2021). Therefore, in the medical process, it is very important to understand the parents' cognition and psychological pressure of the disease. However, at present, many studies have focused on the physical and mental health and social behaviour of children with NE (Hamed et al., 2021; Hu et al., 2021; Jönson Ring et al., 2017; Pavione Rodrigues Pereira et al., 2016; Salehi et al., 2016). In China, most of the current research focuses on the study of disease treatment (Q. Li et al., 2018; Wen, 2017; Xu et al., 2019), and few studies focus on the perception and psychology of parents of children with NE. This study aimed to investigate the level of uncertainty and anxiety in the parents of children with NE, analyse its influencing factors and provide expectations for future care.

## 3 | METHODS

### 3.1 | Design

The present study was designed as a descriptive, analytical study.

### 3.2 | Sample and procedure

In this cross-sectional study, parents of children (each reporting separately about their children) admitted to the paediatric surgery outpatient department of our hospital were invited to participate in the study by a questionnaire survey. The time frame of data collection was from February 2019–October 2020. Participants who (1) were age ≥ 18 years old and were the primary caregiver of the child; (2) had clear consciousness and normal expression and communication; and (3) were willing to participate in this survey and sign a written

informed consent form were included in the study. The exclusion criteria were as follows: those who (1) had taken care of their children for less than 1 year; (2) suffered from severe mental illness or cognitive impairment; or (3) were unwilling to participate in the study. The sample size was calculated to give a 95% power level, a medium effect size (0.3) and a $0.05\alpha$ value. This calculation was performed using G*Power software V3.0.10. The sample size also met the criteria, which recommends approximately five to 10 participants per independent variable item in validity studies (Ni, Chen, & Liu, 2010). As the questionnaire contains 11 independent variable items, the sample size range was selected from 55 to 110. Considering the rate of loss-to-follow-up and sampling error, the sample size was expanded by 1.5 times, and the final reference range was 137–275.

After the researcher explained the purpose and method of the survey in the outpatient clinic, participants completed the electronic questionnaire by themselves, and the researcher guided and answered questions on site to ensure the quality of the survey. A total of 250 questionnaires were distributed, and 247 valid questionnaires were returned, for an effective response rate of 98.8%.

### 3.3 | Measurement

#### 3.3.1 | Demographics

The survey questionnaire was used to evaluate the parents' demographic characteristics, including age, gender, education level, work status, household income, place of residence and whether the child was an only child, the treatment time and the source of medical expense coverage.

#### 3.3.2 | Parent perception of uncertainty scale (PPUS)

This self-evaluation scale is based on the theory of uncertainty in illness (H, 1983) and is used to determine the level of illness uncertainty in hospitalized patients or their family members. The Parent Perception of Uncertainty Scale has a Cronbach's coefficient of 0.844 and content validity of 0.928 (Mai, Xie, Ma, Deng, & Dai, 2013). The scale has 28 items, such as ambiguity (11 items), lack of clarity (8 items), lack of information (5 items) and unpredictability (4 items). The scale uses the Likert 5-level scoring method, with a total score of 28–140. Each item is scored with a 5-point Likert scale ranging from 1 indicating strong disagreement to 5 indicating strong agreement with the item statement. Higher scores indicate a higher level of uncertainty in the parents of children with NE.

#### 3.3.3 | Self-Rating anxiety scale (SAS)

This scale was used to evaluate the subjective feelings of anxiety patients (Zung, 1971). Each item is scored with a 5-point Likert scale

ranging from 0 "not at all" to 4 "almost always like this". The scale consists of 20 items; Item 5, Item 9, Item 13, Item 17 and Item 19 are reverse scored. Scores from the 20 items are summed to obtain the total rough score. The total rough score was multiplied by 1.25 to obtain an integer to obtain the standard score. Higher scores indicate higher levels of anxiety, and the cutoff value is 50.

## 3.4 | Data analysis

Statistical analyses were performed using SPSS, version 24.0 (Statistical Package for the Social Sciences, version 24.0, SPSS Inc.,). Continuous measurement data are expressed as the mean ± SD, and count data are expressed as the number of cases or composition ratio. Between-group comparisons were conducted using $t$ tests and analysis of variance. Differential tests for continuous variables were performed using ANOVA, and Bonferroni or Dunnett T3 tests were performed for pairwise comparisons. The influencing factors of uncertainty in illness were analysed using univariate and multiple linear regression analyses. Pearson correlation analysis was used to determine the correlations between uncertainty in illness and anxiety. $p < .05$ indicated statistically significant results.

## 3.5 | Ethical considerations

The study was approved by the Ethics Committee of the West China Hospital of Sichuan University (ID 20190122). All participants were informed about the objectives, methods, risks and benefits of the research and provided written consent to participate. All patient information was kept confidential. In addition, parents were able to quit at any time of the study. Confidentiality and voluntary participation were ensured in accordance with the Helsinki Declaration.

## 4 | RESULTS

This study included 247 parents of children with NE. Among these parents were 60 fathers (24.3%) and 187 mothers (75.7%), and 57 parents were aged ≤30 years (23.1%) and 190 were aged >30 years (76.9%). In terms of education levels, 74 had a high school degree or below (30.0%), 85 had an associate degree (34.4%), 76 had a graduate-level degree (30.8%) and 12 had a

postgraduate-level degree or above (4.9%). Most of the parents had jobs (74.1%) and lived in urban areas (76.1%). The household income of 107 patients was ≤$ 5,000/m (43.3%) and that of 140 patients was >$ 5,000/m (56.7%). Among these children were 165 boys (66.8%) and 82 girls (33.2%) aged between 3 and 15 years. As shown in Table 1, the total PPUS score was high among parents of children with NE (81.18 ± 10.82), and the anxiety score was 41.86 ± 9.20.

As shown in Table 2, the statistically significant grouping variables were education level, work status, family per capita income, family residence, age of children and treatment time of children. The PPUS score (80.03 ± 11.99) of parents who had a bachelor's degree was lower than that of others ($F$ = 8.255, $p < .05$), and the post hoc comparative analysis showed that the PPUS score of parents with a bachelor's degree was significantly lower than that of parents below a high school or below degree and associate degree, and the difference was statistically significant ($p < .05$). The PPUS score of parents who were employed at the time of this study compared with those who were not employed was lower (83.32 ± 11.01 vs. 88.84 ± 10.46, $t$ = −3.496, $p < .05$). The results show that the PPUS score of parents with a relatively higher household income was lower than those with a relatively lower household income (82.49 ± 11.26 vs. 87.71 ± 10.25, $t$ = 3.749, $p < .05$). The PPUS score increased with the child's age ($F$ = 3.172, $p < .05$). The PPUS score of parents whose child's age was ≥11 years was the highest (89.56 ± 12.17), and the post hoc comparative analysis showed that it was significantly higher than that of parents whose child's age was ≤5 years ($p < .05$). There was a significant difference in the PPUS scores regardless of the children's treatment time. The scores of the treatment time ≤3 months group were lower than those >3 months (84.27 ± 11.25 vs. 85.06 ± 11.08, $t$ = −0.547, $p < .05$).

Variables (parents' educational level, work status, family monthly income, family residence, child's age and child's treatment time) with statistical significance ($p < .05$) identified by univariate analysis were included as independent variables in the multiple linear regression model. The regression analysis results show that parents' working status, family per capita monthly income, and children's treatment time were the main influencing factors for parents' disease uncertainty in children with NE (Table 3). Parents' anxiety scores were positively correlated with disease state uncertainty, information uncertainty, and lack of information, as well as the total score of disease uncertainty ($p < .05$), but were not significantly correlated with the unpredictability dimension score ($P > 0.05$) (Table 4).

**TABLE 1** Parental illness uncertainty and scores of various dimensions of children with nocturnal enuresis (N = 247)

| Item | Score range | Minimum | Maximum | Score ($\bar{x} \pm s$) |
|---|---|---|---|---|
| Ambiguity | 11–55 | 16.00 | 53.00 | 33.88 ± 6.77 |
| Lack of clarity | 8–40 | 10.00 | 32.00 | 22.08 ± 3.82 |
| Lack of information | 5–25 | 7.00 | 22.00 | 15.80 ± 2.32 |
| Unpredictability | 4–20 | 6.00 | 20.00 | 12.97 ± 2.30 |
| Total PPUS score | 28–140 | 49.00 | 119.00 | 81.18 ± 10.82 |

Abbreviation: PPUS, Parent Perception of Uncertainty Scale.

| Item | N | (%) | PPUS score | (t/F) | p |
|---|---|---|---|---|---|
| Gender | | | | 1.365 | .173 |
|   Male | 60 | 24.3% | 83.05 ± 10.74 | | |
|   Female | 187 | 75.7% | 85.29 ± 11.21 | | |
| Age | | | | 1.678 | .095 |
|   ≤30 | 57 | 23.1% | 86.91 ± 10.72 | | |
|   >30 | 190 | 76.9% | 84.11 ± 11.18 | | |
| Education level | | | | 8.255 | .000 |
|   High school or below | 74 | 30.0% | 88.50 ± 9.44 | | |
|   Associate degree | 85 | 34.4% | 85.75 ± 9.62 | | |
|   Bachelor | 76 | 30.8% | 80.03 ± 11.99 | | |
|   Master or above | 12 | 4.9% | 84.41 ± 15.14 | | |
| Work status | | | | 3.496 | .001 |
|   With work | 183 | 74.1% | 83.32 ± 11.01 | | |
|   Without | 64 | 25.9% | 88.84 ± 10.46 | | |
| Household income | | | | 3.749 | .000 |
|   ≤$ 5,000/m | 107 | 43.3% | 87.71 ± 10.25 | | |
|   >$ 5,000/m | 140 | 56.7% | 82.49 ± 11.26 | | |
| Place of residence | | | | 2.461 | .015 |
|   Rural area | 59 | 23.9% | 87.83 ± 9.17 | | |
|   Urban area | 188 | 76.1% | 83.78 ± 11.51 | | |
| Gender of children | | | | 1.323 | .187 |
|   Male | 165 | 66.8% | 85.41 ± 10.71 | | |
|   Female | 82 | 33.2% | 83.42 ± 11.86 | | |
| Age of children | | | | 3.172 | .044 |
|   ≤5 | 65 | 26.3% | 83.03 ± 9.14 | | |
|   6–10 | 157 | 63.6% | 84.70 ± 11.53 | | |
|   ≥11 | 25 | 10.1% | 89.56 ± 12.17 | | |
| Only child | | | | 1.484 | .139 |
|   Yes | 108 | 43.7% | 83.56 ± 11.04 | | |
|   No | 139 | 56.3% | 85.67 ± 11.12 | | |
| Treatment time for children | | | | 3.161 | .002 |
|   ≤3 months | 185 | 74.9% | 83.48 ± 10.86 | | |
|   >3 months | 62 | 25.1% | 88.54 ± 11.08 | | |
| Medical insurance | | | | −0.547 | .585 |
|   Yes | 98 | 39.7% | 84.27 ± 11.25 | | |
|   No | 149 | 60.3% | 85.06 ± 11.08 | | |

## 5 | DISCUSSION

Mishel proposed that when the individual's disease uncertainty score is greater than 50% of the highest score, there is a higher level of disease uncertainty (MH, 1988). The PPUS score (81.18 ± 10.82) determined in this study was greater than 50% of the total score, indicating a high level of uncertainty, consistent with the results of previous studies (Lin, Yeh, & Mishel, 2010; L. Zhao, Meng, & Huang, 2019b). In addition, the parent anxiety score (41.86 ± 9.20) was statistically higher than the Chinese norm (29.78 ± 10.07)

(Zhang, 1998), similar to that reported by Qu Dan et al. (Qu & Wu, 2016).

Possible reasons for the higher levels of uncertainty and anxiety in these parents are listed below: (1) The pathogenesis of NE is complex and involves many factors, such as the central nervous system, circadian rhythm function, bladder function and genetics (Wright, 2020). Parents of affected children may have a lack of knowledge about the disease, incomplete information acquisition, or may not comprehend the information. (2) NE has a long course and high recurrence. Although approximately 15% of children with

**TABLE 3** Multiple linear regression analysis of influencing factors of illness uncertainty in children with nocturnal enuresis

| Independent variable | Regression coefficient | Standard error | Standardization regression coefficient | t | p |
|---|---|---|---|---|---|
| Constants | 80.845 | 4.892 | | 16.527 | .000 |
| Education level of parents | −1.522 | .919 | −.122 | −1.656 | .099 |
| Work status of parents | 4.056 | 1.605 | .160 | 2.526 | .012 |
| Household income | −3.717 | 1.464 | .166 | −2.538 | .012 |
| Place of residence | −.180 | 1.797 | .007 | −.100 | .920 |
| Age of children | 1.675 | 1.194 | .088 | 1.403 | .162 |
| Treatment time for children | 4.050 | 1.597 | .158 | 2.536 | .012 |

**TABLE 4** Correlation analysis of parents' anxiety score and illness uncertainty score of children with nocturnal enuresis (N = 247)

| | Ambiguity | Lack of clarity | Lack of information | Unpredictability | PPUS score |
|---|---|---|---|---|---|
| SAS score | 0.494** | 0.401** | 0.249** | −0.040 | 0.481** |

**Significant correlation at $p < .01$.

Abbreviations: SAS, Self-Rating Anxiety Scale; PPUS, Parent Perception of Uncertainty Scale.

NE are cured each year, enuresis symptoms continue to adulthood in approximately 0.5%–2% of children (Shen et al., 2014). This engenders a greater burden of care and psychological pressure on the parents of these children. (3) Parents must urge their children to adjust their work and rest habits, develop good urination (defecation) habits, standardize a urination diary, and follow doctors' orders during the treatment, all of which can lead to increased disease uncertainty and anxiety.

The results of this study show that unemployed parents had higher scores of illness uncertainty than those with jobs. The possible reason is that compared with unemployed parents, parents with jobs have a more stable economic income and better access to medical resources, resulting in more ways to acquire more disease-related knowledge, better coping mechanisms, and improved ability to manage the disease (Wu, Wen, Li, & Lei, 2020; Yang et al., 2015). In addition, careers can contribute to a parent's self-worth, thereby reducing their attention to their children's illness and their illness uncertainty and anxiety. The results of this study indicate that the higher the family's per capita monthly income is, the lower the illness uncertainty, which is consistent with existing research results (Zhao, Mao, & Li, 2019a). Because NE has a long course and treatment cycle, it requires substantial manpower and material and financial resources, which put pressure on the family economy. Furthermore, the family's economic level will affect the choice of medical treatment and the cognition of the disease, thereby affecting the level of disease uncertainty (Perez et al., 2020). One interesting finding of the present research is that the longer a child's treatment time is, the higher the level of parental uncertainty. Studies have shown that with longer treatment times, patients and/or their family members receive more and more comprehensive medical information, so the level of disease uncertainty is lower. However, due to the particularity of NE, the prolonged treatment time of children may be accompanied by a series of problems, such as recurrence, poor treatment effects and poor compliance. The treatment plan may generate

more doubts and uncertainties, leading to an increase in the level of disease uncertainty. The finding emerging from the analysis is that the total scores of illness uncertainty and the dimensional scores of disease state uncertainty, information uncertainty, and lack of information were positively correlated with anxiety scores; that is, the higher the anxiety level, the higher the uncertainty level (Schiele, Emery, & Jackson, 2019).

In summary, the diagnosis, treatment and management of children with NE is a complex and long-term process. Medical staff should pay attention not only to the disease itself but also to the uncertainty and psychological state of the parents of children with NE.

## 6 | LIMITATION

This study has several limitations that should be considered. First, this study has a descriptive cross-sectional design; thus, further research is needed to test the scalability of PPUS throughout the disease trajectory and to explore the intervention methods for illness uncertainty and the scalability of PPUS in the whole disease trajectory. Second, a convenience sampling method was used. All parents were recruited from the paediatric surgery clinic of the same general hospital, and the group of participants may not be representative of the whole population of parents of children with NE in China.

## 7 | CONCLUSION

Parents' uncertainty about the illness and anxiety of children with NE are at a high level. Working status, family per capita monthly income, and children's treatment time were the main influencing factors for parents' uncertainty in illness in children with NE. It is important to explore a disease follow-up management model that integrates medical and patient care and standardizes the

management of the disease throughout the entire process to improve the level of parental care of children and reduce their illness uncertainty and anxiety. In future research, qualitative research methods should be used to further explore the causes and influencing factors of parents' illness uncertainty and anxiety in children with NE to provide a basis for formulating intervention programmes.

## AUTHOR CONTRIBUTIONS

Wen-Jiao Huang: Conceptualization, Methodology, Software, Data curation, Writing- Original draft preparation. Yuan-Yuan Liang: Visualization, Investigation. Xue Ma: Supervision. Qian Yang: Software, Validation.

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## CONFLICTS OF INTEREST

The authors report no actual or potential conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

## ORCID

*Wen-Jiao Huang* https://orcid.org/0000-0003-4554-5605

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