

## Original Article

# Security in adults with primary nephrotic syndrome

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Received July 20, 2017; Accepted August 24, 2017; Epub September 15, 2017; Published September 30, 2017

**Abstract:** Objective: To analyze the factors affecting psychological security in patients suffering from primary nephrotic syndrome (PNS), and to evaluate the effect of security-insecurity on the conditions and treatment of PNS in adults. Methods: A total of 286 adults with PNS who were first diagnosed as having PNS and met the inclusion criteria were enrolled in our study. The patient's security status was assessed by integrating the patients' self-assessment and the clinicians' judgement. The patients were followed for 6 months. Data were collected from the patients, including demographics, length of hospital stay, 24 h urinary protein at admission and discharge, serum albumin at admission and discharge and clinical outcomes at follow-up. The factors that affect psychological security and clinical outcome of the patients were assessed with the use of univariate regression analysis and logistic regression analysis. Results: The number of male patients with first-diagnosed PNS was larger than that of females, and 39.51% of the patients aged 51-65 years. The association of PNS with the three factors including a family history of kidney disease, relatives died of kidney disease and frequent solitude was not statistically significant ( $P>0.05$ ). The rates of normal security, insecurity, lack of security, and severe lack of security occurred in adults with PNS were 9.09%, 34.27%, 33.57% and 23.07%, respectively. No gender difference was shown in the sense of security of patients with PNS. Significant differences in self-security-insecurity and security-insecurity overall score were found between the PNS adults with more income ( $>100,000$  yuan) and those with less income ( $<100,000$  yuan) (self-security-insecurity,  $P=0.039$ ; security-insecurity overall score,  $P=0.045$ ). Furthermore, lower personal or household income contributed to higher security-insecurity score and a stronger trend of insecurity ( $P=0.001$ ). Statistically significant differences were observed in the variables including albumin ( $P=0.018$ ), 24 h urinary protein ( $P=0.035$ ), length of hospital stay ( $P=0.022$ ), and prognostic response ( $P=0.019$ ) before and after treatment among all patients. Logistic regression analysis documented that the outcomes of patients with PNS were positively correlated with personal and household income, Alb level, whereas the psychological security score, 24 h urinary protein and length of hospital stay were the risk factors of clinical outcomes. Conclusion: Income has a great impact on the security of adults suffering from PNS, and a higher psychological security score is a major risk factor for clinical outcome in patients with PNS.

**Keywords:** Primary nephrotic syndrome, security-insecurity, hospital stay

### Introduction

Nephrotic syndrome is one of the most common manifestations of kidney disease in adults and children. A variety of causes contribute to increased permeability of glomerular filtration membrane in patients suffering from nephrotic syndrome, excretion of a great deal of protein and thereby development of systemic edema and hypoproteinemia. The incidence of nephrotic syndrome is 3 per 100,000 person-years in adults whereas the incidence in children is as 15 times as that in adults [1, 2]. For example, the incidence of idiopathic nephrotic syndrome

in children is 0.005% in Japan [3]. The diagnostic criteria for nephrotic syndrome are daily urinary protein  $>3.5$  g, serum albumin  $<3.0$  g/dL, systemic edema and hyperlipidemia. Therefore, the clinical condition of nephrotic syndrome can be evaluated based on the levels of urinary protein, serum albumin, blood lipids, serum creatinine and of urea nitrogen [4-6].

Psychologist Maslow argued that security "is a sense of confidence, security and freedom that is divorced from fear and anxiety and it is a feeling of meeting the needs of an individual at present and in the future" [7]. Maslow's securi-

## Security in adults with primary nephrotic syndrome

**Table 1.** General data of adults with PNS (n, %)

Factor	No. Patients (n=286)	Percentage (%)
<b>Age</b>		
18-35	27	9.44
36-50	98	34.27
51-65	113	39.51
>65	48	16.78
<b>Gender</b>		
Male	169	59.09
Female	117	40.91
<b>Education</b>		
Illiteracy	25	8.74
Primary	43	15.03
Secondary	179	62.59
University or above	39	13.64
<b>Occupation</b>		
On-active duty	139	48.60
Self-support	32	11.19
Unemployed	48	16.78
Retired	67	23.43
<b>Medicare subtype</b>		
Urban worker	104	36.36
Urban resident	83	29.02
New rural cooperative	69	24.13
Other	30	10.49
<b>Family history of kidney disease</b>		
Yes	76	26.57
No	210	73.43
<b>Relatives died from kidney disease</b>		
Yes	23	8.04
No	263	91.96
<b>Frequent solitude</b>		
Yes	40	13.99
No	246	86.01

ty-insecurity test can be utilized for clinical or theoretical study of psychological or emotional security. The theory “kidney is fear reflected in emotions” is one of the classical theories of Chinese traditional medicine focused on internal injuries caused by excess of seven emotions (joy, anger, sorrow, think, sadness, fear, and surprise). The theory is of significance to investigate the orientated and qualitative judgment of lesions formed as a result of the impact of abnormal changes in emotion or psychology on organs or functions of the human body. That is, the psychological or emotional factors may affect the onset, progression and treatment of the disease [8]. Currently, few studies are impli-

cated in the impact of the psychological or emotional factors on the prognosis of adult nephrotic syndrome. In the study of children with nephrotic syndrome, nevertheless, the children with more complaints of the body and more severe external behavior disorder led to more severe symptoms of nephrotic syndrome, and those with such psychological problems as anxiety and depression suffer from longer refractory nephrotic syndrome [9, 10]. The children’s social and psychological needs may play a role in management of nephrotic syndrome. Therefore, the effects of social and psychological factors should be taken seriously in the treatment of nephrotic syndrome [11].

In the present paper, we assessed the feelings of adult patients with primary nephrotic syndrome (PNS) using Maslow’s security-insecurity test, and investigated the effects of affective factors on clinical outcomes.

### Materials and methods

#### *Inclusion and exclusion criteria*

This was an observational study conducted in the form of questionnaire. The patients who met the inclusion criteria and provided informed written consent were enrolled into the study.

The patients were included if they were first diagnosed as having adult PNS based on the diagnostic criteria and aged older than 18 years. Any patient was excluded if they had a history of underlying mental condition; secondary nephrotic syndrome; comorbid diseases including the diseases in the blood system, malignant tumors, chronic cardiac dysfunctions, chronic respiratory diseases, chronic liver diseases and other disorders (solid tumor nephropathy may interfere with the judgment of prognosis); drug-related nephrotic syndrome.

#### *Study methods*

*Methods of clinical data collection:* All patients admitted to the Urology Department from December 2015 to December 2016 were sub-

## Security in adults with primary nephrotic syndrome

**Table 2.** Overall security-insecurity in adult with PNS

Factor	Normal	Insecurity predisposition	Lack of security	Severe Lack of security
SSI	7.13±1.35	10.75±2.45	12.25±2.87	17.39±4.86
ISI	6.57±1.89	9.84±2.01	10.36±2.11	18.72±5.73
SSI	5.86±1.25	6.74±1.98	12.65±2.76	16.71±5.32
SIOS	19.47±1.69	27.33±2.19	35.26±2.58	52.81±5.49
Percentage of patients (%)	9.09	34.27	33.57	23.07

Note: SSI denotes emotional security-insecurity, ISI Interpersonal security-insecurity, SSI self-security-insecurity, SIOS security-insecurity overall score.

**Table 3.** Differences of security-insecurity in gender among adults with PNS

Factor	Male (n=169)	Female (n=117)	t	P
SSI	11.56±3.56	11.09±3.86	0.765	0.796
ISI	12.45±3.89	13.01±4.22	-0.352	0.953
SSI	5.73±2.31	3.92±2.51	6.012	0.961
SIOS	29.63±8.95	27.96±9.59	1.563	0.847

Note: SSI denotes emotional security-insecurity, ISI Interpersonal security-insecurity, SSI self-security-insecurity, SIOS security-insecurity overall score.

jected to screening in terms of inclusion and exclusion criteria. The eligible patients filled out the data collection form covering the following major categories.

**Demographic data:** gender, age, BMI (body mass index), census register, occupation.

**Current medical history:** etiology at admission, illness severity (CKD stage).

**Previous and present diseases and complications:** high blood pressure, diabetes mellitus, hyperlipidemia, well-controlled blood pressure/glucose/lipid, history of other diseases, medication (type, dose), complications of SLE, allergic purpura, chronic infectious diseases, and thyroid diseases.

**Other factors:** education background, income (individual and household overall), health insurance and its sub-types, a family history of mental illness.

The subjects were filled in the questionnaire under the on-spot guidance of the health-care workers (all the investigators involved in the study were required to receive training). When collecting the distributed questionnaires, the health-care workers were required to check whether all the items in the questionnaires were completely filled out and to ask the sub-

jects to make up, if any, the missing parts. The questionnaires were kept by the researchers immediately after collection. Besides, the data were input by a duplex computer system method. After data input, the input operators were asked to compare the data twice. If there was anything wrong, the relevant questionnaire was verified again. In case of obvious abnormal data, timely feedback was required and the patients concerned were re-investigated.

**Laboratory test:** The eligible patients were subjected to the following laboratory tests: 24 h urinary protein, serum albumin (Alb), blood lipid, blood glucose, coagulation, as well as electrocardiography at admission, quantitative test of 24 h urinary protein (renal function test, serum albumin and blood lipid levels) at discharge, and renopuncture.

**Maslow's security-insecurity test:** Maslow's criteria for security-insecurity classification were described below [7]. The subjects were assigned to four natural cohort groups based on Maslow's scoring system: normal (0-25 points), insecure tendency (26-30 points), lack of security (31-38 points), and severe lack of security ( $\geq 39$  points). The patients who met the inclusion criteria were assessed by combining the patients' self-assessment and the physicians' evaluation.

### *Follow-up and outcome measures*

**Follow-up criteria:** A total of 286 patients, with a follow-up rate of 100%, were followed for 6 months (from the first day at admission). The follow-up included the patients' psychological security and clinical outcomes.

The primary outcome measures in this study included Maslow's security-insecurity scores, length of hospital stay, quantitative results of 24 h urine protein quantification at admission

## Security in adults with primary nephrotic syndrome

**Table 4.** Differences of security-insecurity in personal and household income among adults with PNS

Group	Income (yuan)	SSI	ISI	SSI	SIOS	P
Control	Less than 100,000 (n=95)	11.39±3.56	12.72±3.73	12.71±3.32	36.81±3.4	-
	100,000-150,000 (n=67)	11.25±2.47	10.36±1.98	9.65±2.16	32.26±2.39	0.085
	150,000-200,000 (n=98)	10.75±2.15	10.84±1.78	7.72±2.36	28.33±2.19	0.039*
	Over 200,000 (n=26)	8.33±1.65	7.47±1.49	6.56±1.558	21.47±1.56	0.045*

Note: \*, P<0.05. SSI denotes emotional security-insecurity, ISI Interpersonal security-insecurity, SSI self-security-insecurity, SIOS security-insecurity overall score.

**Table 5.** Linear regression analysis on the correlation of security score with income in adult with PNS

Variable	b	P	95% CI	SE	t
Intercept	44.09	0.000	(42.03, 45.96)	0.22	35.77
X Variable	0.95	0.001	(-0.79-1.02)	0.099	-9.54

and discharge, as well as blood albumin at admission and discharge.

Clinical outcomes were determined based on both the patient's self-report and the clinician's judgment, including complete response, partial response, no response, and recurrence.

### Statistical analysis

All statistical data analyses were performed with the use of SPSS software, version 19.0. The measurement data were expressed as mean ± standard deviation. P<0.05 was considered statistically significant. The independent sample t-test, the paired t-test, univariate regression analysis and logistic regression analysis were employed for analyses of the factors influencing psychological security and the outcomes of patients with PNS.

## Results

### General data

**Table 1** shows the basic characteristics of general data from adults with PNS. The results revealed that 39.51% of the patients with PNS had an age ranging from 51 to 65 years. There were more males (59.09%) than females (40.91%). Most patients had the highest education level of secondary school (62.59%), and 48.60% of the patients were still on active duty. In the medical insurance, the patient had various degrees of medical care, more than 36.27% of whom were urban workers. On correlation analysis, the development of prima-

ry nephropathy in adults were not correlated with a family history of kidney disease, whether some relatives had died from kidney disease or frequent solitude, indicating no statistically significant difference was noted between PNS and genetic factors including a family medical history (P>0.05).

### Factors influencing psychological security in adults with PNS

**Overall security-insecurity in adults with PNS:** The investigation and analyses on overall security-insecurity and respective dimension performance in adults suffering from PNS are shown in **Table 2**. The results indicated that, among the patients who had PNS, the proportions of those with a predisposition of insecurity and lack of security were larger (34.27%, 33.57%, respectively); those with a predisposition of severe lack of insecurity accounted for 23.07%; those with normal security for only 9.09%. This suggests that a considerable proportion of patients with PNS have a sense of insecurity.

**Differences of security-insecurity in gender among adults with PNS:** The analyses on the differences in security-insecurity among adults with PNS were performed with the use of the independent sample t-test (**Table 3**). No significant differences were showed in overall score and all dimensions of security-insecurity in patients with PNS (All P>0.05). The difference in gender was insignificant. The overall score of the overall security of male and female patients were shown to be a preposition of insecurity.

**Differences of security-insecurity in income among adults with PNS:** The differences of security-insecurity in personal and household income among the adults with PNS were analyzed using one-way analysis of variance (ANOVA), with the patients with income less than 100,000 yuan as controls (**Table 4**). The

## Security in adults with primary nephrotic syndrome

**Table 6.** Comparison of Alb and 24 h urinary protein levels in adults with PNS before and after hospitalization

Variable	Normal	Insecurity predisposition	Lack of security	Severe Lack of security
Admission Alb (g/dl)	2.55±0.67	2.13±0.59	1.87±0.47	1.78±0.54
Discharge Alb (g/dl)	3.84±0.99	3.55±0.59	2.83±4.15	2.64±3.58
Δ Alb (g/dl)	1.29±0.83	1.32±0.59	0.96±2.31	0.86±2.06
t	7.925	22.148	4.072	3.392
P	<0.001	<0.001	<0.001	0.001
Admission 24 h Urine protein (g/24 h)	4.45±1.67	5.63±2.15	6.36±4.63	6.54±5.12
Discharge 24 h Urine protein (g/24 h)	2.87±0.53	3.35±1.26	3.89±1.52	4.23±1.70
Δ 24 h Urine protein	-1.58±2.10	-2.28±2.71	-1.47±3.08	-2.31±3.41
t	3.836	8.329	4.676	5.503
P	<0.001	<0.001	<0.001	<0.001

The paired t-test was utilized for comparing hospitalization of adults with PNS (Table 6). After a period of hospitalization, improvements of varying degrees were observed in the patient's Alb and 24 h urine protein levels at discharge. On the statistical analyses, the differences between the Alb and 24 h urinary protein levels before hospitalization and those after hospitalization were statistically significant among all the patients (All P<0.05).

**Table 7.** Prognosis of the adults with PNS

	Normal	Insecurity predisposition	Lack of security	Severe lack of security	P
Security-insecurity score	20.35±2.36	26.53±2.54	36.52±2.79	50.65±4.76	
Hospital stay (d)	11.5±3.9	13.6±4.1	12.7±3.4	15.8±4.6	0.022*
Prognostic response	Full response	Partial response	No response	Recurrence	0.019*

Note: \*, P<0.05.

results showed that there were significant differences in the overall scores of self-security-insecurity and security-insecurity between the patients with larger individual and house-hold income and those with smaller individual and house-hold income (P=0.039, P=0.045, respectively). The patients with individual and house-hold income more than 200,000 yuan was assessed to be secure, suggesting that income was a factor which greatly impacted the security of adults with PNS.

With security score used as a dependent variable of the continuous variables and income grades (100,000 yuan or less, 100,000-150,000 yuan, 150,000-200,000 yuan, 200,000 yuan or more) as an independent variable, the univariate linear regression analysis was performed for the association between psychological security score and income in adults with PNS (Table 5). The results demonstrated that personal or household income of the patient was a factor impacting the security score. Lower income contributed considerable to the security score, i.e. a stronger predisposi-

tion of insecurity, and the difference was statistically significant (P<0.05).

### *Impact of psychological security on clinical outcome in adult with PNS*

The paired t-test was utilized for comparing hospitalization of adults with PNS (Table 6). After a period of hospitalization, improvements of varying degrees were observed in the patient's Alb and 24 h urine protein levels at discharge. The two variables were normal in the patients with normal security-insecurity score at discharge (26.04±6.99 g/dl (normal, >3.0 g/dl; 2.87±0.53 g/24 h (normal, <3.5 g/dl), respectively). The Alb level was within the normal range but the 24 h urine protein level did not completely reach the normal range at discharge in other patients. Thus they were required to receive further treatment and management. On the statistical analyses, the differences between the Alb and 24 h urinary protein levels before hospitalization and those after hospitalization were statistically significant among all the patients (All P<0.05).

## Security in adults with primary nephrotic syndrome

**Table 8.** Assigned values of variables in logistic regression analysis

Variable	Factor	Assigned value
Y	Dependent variable	1=Full and partial response; 0=No response, recurrence
X <sub>1</sub>	Age	0=18-35, 1=36-50, 2=51-65, 3=65 or over
X <sub>2</sub>	Gender	0=Male, 1=Female
X <sub>3</sub>	Education	0=Illiteracy, 1=Primary, 2=Secondary, 3=University or above
X <sub>4</sub>	Medical insurance subtype	X4 <sub>1</sub> X4 <sub>2</sub> X4 <sub>3</sub>
(Dumb variable)	Urban worker (reference)	0                              0                              0
	Urban resident	1                              0                              0
	New rural cooperative	0                              1                              0
	Other	0                              0                              1
X <sub>5</sub>	Personal and household income	0=less than 100,000 yuan,1=100,000-150,000 yuan, 2=150,000-200,000 yuan, 3=200,000 yuan
X <sub>6</sub>	Psychological security score	0=Normal, 1=Insecurity predisposition, 2=Lack of security, 3=Severe lack of security
X <sub>7</sub>	Alb	0=Less than 3.0 g/dl (abnormal), 1=More than 3.0 g/dl (normal)
X <sub>8</sub>	24 h urinary protein	0=Less than 3.5 g/dl (normal), 1=More than 3.5 g/dl (abnormal)
X	Length of hospital stay	0=Shorter than 12 h, 1=Longer than 13 h

**Table 9.** Factors affecting clinical outcome in the logistic regression analysis

Factor	Regression coefficient	Wald value	OR	P	95% CI
Personal and household income	3.972	23.597	0.486	0.016	0.235-0.945
Psychological security score	-5.105	37.673	2.660	0.001	1.309-3.054
Alb	1.246	17.749	0.803	0.021	0.536-0.928
24 h urinary protein	-1.392	28.412	1.695	0.000	0.543-1.894
Length of hospital stay	-2.562	16.428	1.673	0.009	1.035-2.632

As shown in **Table 7**, the security-insecurity score and prognostic response indicated that higher security-insecurity score and longer hospital stay were more detrimental to the prognosis of the disease, and the statistical results were significantly different ( $P < 0.05$ ).

### *Multivariate logistic regression analysis on factors affecting clinical outcome in adults with PNS*

A multivariate logistic regression analysis was performed with the general data (age, gender, education background, medical insurance subtype), personal and household income, psychological security score, serum albumin (Alb) level, 24 h urinary protein level, length of hospital stay of the patients used as variables and their clinical outcome used as dependent variable. The values of the variables were shown in **Table 8**. All the statistically significant factors were involved in the logistic regression analysis (**Table 9**). On the analysis, the clinical outcome of adults with PNS was found to be positively correlated with personal and household

income, the Alb level, and the psychological security score, while 24 h urinary protein and length of hospital stay were the risk factors for clinical outcomes.

### **Discussion**

The results of this study demonstrated that adults with PNS were on a trend of younger age, with more male than female patients, which was consistent with the results of other relevant reports [12]. The disease was not caused by hereditary factors and not associated with such genetic factors as the family history of kidney disease, and whether the relatives died from kidney disease due to death [13]. Only a few (less than 10%) adults with a normal sense of security had PNS. Most patients with PNS showed lack of security, indicating that patients with PNS had considerable insecurity. The differences in security-insecurity overall score and the respective dimensions were insignificant among the adults with PNS. No difference was found in gender. The overall scores of se-

curity-insecurity in all patients were shown to be insecure. The self-security-insecurity and security-insecurity scores in the adults with PNS who had higher personal and household income were significantly different from those with lower personal and household income. Therefore, income was a factor that greatly affected the sense of security in patients with PNS. This was similar to the view held by Jorge et al. that the low-income population was more vulnerable to complications of diabetes [14].

In our study, we also found that in security-insecurity score and prognostic response, the patients with normal scores, those with insecurity predisposition, those lacking of security and those severely lacking of security corresponded to full response, partial response, no response and recurrence, respectively. In addition, logistic regression analysis indicated that higher psychological security scores and lower-income status were shown to be risk factors for outcomes of patients with PNS, suggesting that improved psychological security score and increased income level were associated with improved response of the adults with PNS. This validates the hypothesis that improving the affective disorder had a positive effect on the improvement in the symptoms of nephrotic syndrome [15]. The result was consistent with those in the studies regarding income levels and psychological security scores which were factors affecting the outcomes of the patients or how to improve the outcomes [16-19]. In recent years, only a small amount of related studies have been involve in the studies on psychological behavior in patients with nephrotic syndrome, and most of such patients were children [20-22]. The studies have brought insights into this study. The results of the present study and of the relevant literature reported were sufficient to prove that the application of psychological health intervention to treat patients with nephrotic syndrome has attracted attention from clinicians and medical researchers [23, 24].

In conclusion, we made an initial investigation on the sense of security in adults with PNS and reached a tentative conclusion. Therefore, our study was of clinical significance and worthy of clinical reference. However, due to some limitations, more studies are needed to explore how to improve the efficacy of the treatment in patients with PNS by enhancing their psychological security.

### Disclosure of conflict of interest

None.

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## Security in adults with primary nephrotic syndrome

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