Original Article

Relationship between outpatient duration of young outpatient physicians and lower urinary tract symptoms and sexual dysfunction

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Background: In China, physicians aged 30–45 years who work in tertiary hospitals perform most of the clinical duties, especially outpatient services, and the high-intensity, high-pressure workplace may through long-term sedentary affect their health, particularly urinary health.

Methods: The study, conducted from October 2020 to October 2021, included male physicians in Xiangya Hospital, the Second Xiangya Hospital, and the Third Xiangya Hospital of Central South University (Hunan, China). They were divided into surgeon and non-surgeon groups. We collect the data on age, body mass index (BMI), duration of outpatient duties and the International Prostate Symptom Score-voiding (IPSS-V) and IPSS-storage (IPSS-S), and the IPSS-Total, and the IPSS-Quality of Life Index (IPSS-QOL), and the Athens insomnia scale (AIS), and the International Prostate Symptom Score (IIEF-5).

Results: The duration of outpatient duties positively correlated with IPSS-Total (P<0.001), IPSS-S (P<0.001), and IPSS-QOL (P<0.001) and negatively correlated with IIEF-5 (p=0.032). Compared to non-surgeons, surgeons performed fewer outpatient duties. The IPSS-Total (P=0.016), IPSS-Storage (P=0.005), and QOL scores (P=0.046) of the non-surgeon group were higher and the IIEF-5 scores were lower (P=0.039). There were no significant differences between the groups regarding age, body mass index, IPSS-Voiding, and Athens insomnia scale scores. A positive correlation between outpatient visit duration and lower urinary tract symptoms (LUTS) in the IPSS-Storage subscale was observed and there was a weak negative correlation between duration of outpatient duties and the IIEF-5 score.

Conclusions: Compared to surgeons, non-surgeons had more outpatient duties, and they experienced more severe LUTS and sexual dysfunction, which suggests that outpatient duties maybe should not be more than 4 days/week in Chinese tertiary medical centers.

Keywords: China; lower urinary tract symptoms (LUTS); outpatients; sexual dysfunction

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Introduction

In China, high-quality medical resources are predominantly concentrated in large-scale tertiary hospitals, which undertake a multitude of complex diagnoses and treatments (1). According to the statistical report of the National Health Commission of China, as of November 2020, China had 35,000 hospitals, 7.6% of which are tertiary centers [2,681], but account for 52.6% of the total diagnostic and

therapeutic work. Young physicians aged 30–45 years who work in tertiary hospitals perform most of the clinical duties, including but not limited to outpatient services, surgeries, medical record writing, ward rounds, and others. Outpatient services are a key role among these duties.

In various national and regional tertiary medical centers, such as Xiangya Hospital, outpatient physicians admit an average of 70–100 patients every day, which means they need to complete the consultation, diagnosis, and treatment of one patient every 5 min, resulting in being seated for long periods of time. Furthermore, conflicts between physicians and patient relationship remain to be solved, although they have been controlled to some extent in recent years. Instances of physicians being attacked and even killed have been reported (2), which increases mental stress and leads to poor sleep quality. However, the health, especially urinary health, of these young physicians has not received wide attention. In fact, there is currently no literature describing Lower urinary tract symptoms (LUTS) symptoms and sexual dysfunction in this occupation population.

LUTS comprise frequent micturition, urinary urgency, and dysuria, among others, and are related to lower urinary tract diseases (3). These symptoms, which can be divided into urine storage and urine voiding symptoms, are common in young and middle-aged people. Additionally, some patients with LUTS may have sexual dysfunction (4). The onset of LUTS could be triggered by several factors, such as diet (5), exercise (6,7), metabolic syndrome (8-10), environmental temperature (11), and so on. It has also been shown that LUTS is related to smoking (12), sedentary habits (5), urinary retention (13), etc., all of which are experienced by the young outpatient physicians, particularly those who work long shifts, in tertiary hospitals. In addition, sleep disorders may aggravate the symptoms of LUTS (14).

Sexual dysfunction, which often manifests as abnormal or absent sexual psychological and physiological responses, among which erectile dysfunction is predominant. Erectile dysfunction is a multidimensional but common male sexual dysfunction that involves an alteration in any of the components of the erectile response, including organic and psychological causes (15). A few studies have reported that psychological stress and sleep disorder could potentially trigger sexual dysfunction (16,17).

Against this background, we sought to explore whether the high-intensity, high-pressure workplace in tertiary hospitals is associated with the occurrence of LUTS, sexual dysfunction, and sleep disorders in young outpatient physicians in China. Moreover, we also aimed to determine the optimal duration of outpatient duties in tertiary medical centers in China. We present the following article in accordance with the STROBE reporting checklist (available at https://tau.amegroups.com/article/view/10.21037/tau-22-544/rc).

Methods

Participants

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the ethics committee of the Xiangya Hospital of Central South University (No. 201703545), and written informed consent was obtained from all participants. Both participating hospitals were informed and agreed the study. Male physicians in Xiangya Hospital, the Second Xiangya Hospital, and the Third Xiangya Hospital of Central South University (Hunan, China) were selected as participants in the study, which was conducted from October 2020 to October 2021. The data were collected by online questionnaire. We used a combination of on-site visits and online notifications to prompt the participants to complete the questionnaire (Appendix 1). We invited 258 respondents to participate in our questionnaire survey and finally received a total of 231 questionnaires. After excluding those that did not meet the criteria, 186 questionnaires were analyzed. The inclusion criterion was: male physician aged 30–45 years providing continuous outpatient service for >1 year, and with a regular outpatient schedule (no changes in the past year). The exclusion criteria were: history of urinary tract infections, urethral stricture, benign prostatic hyperplasia, urinary tract tumor, urological surgery history or trauma, neurogenic bladder dysfunction, and known urinary system malignant diseases (*Figure 1*).

Data collection

We used standardized structured questionnaires to collect the data on age, body mass index (BMI), duration of outpatient duties, etc. The International Prostate Symptom Score-voiding (IPSS-V) and IPSS-storage (IPSS-S) subscores were recorded separately using the Chinese version of the IPSS, and the IPSS-Quality of Life Index (IPSS-QOL) (18) was used to evaluate the respondents' LUTS. The Athens insomnia scale (AIS) (19) was used to measure the respondents' sleep quality, and the

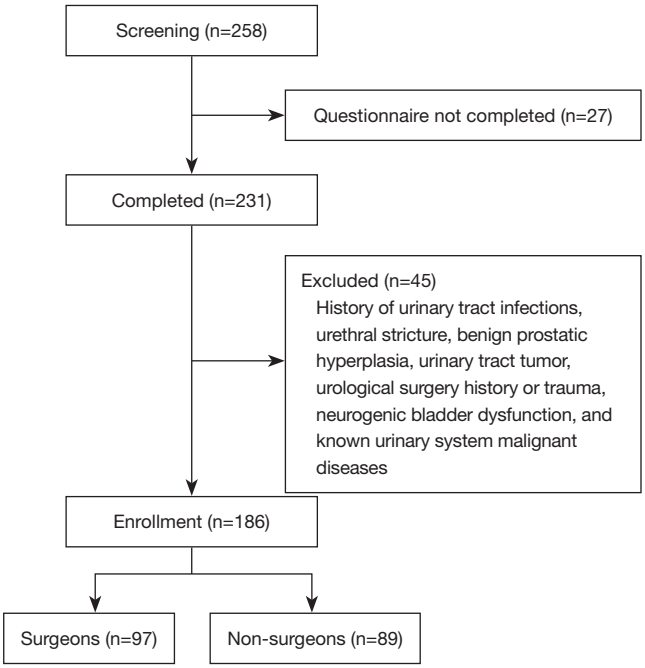

Figure 1 Flowchart shows respondent selection process for study.

Table 1 Correlation between the duration of outpatient duties and each variable

Variable	Spearman's correlation analysis	
	Correlation coefficient	P value
Age (years)	0.011	0.880
BMI (kg/m^2)	–0.065	0.379
IPSS-Total	0.270	<0.001
IPSS-V	0.103	0.161
IPSS-S	0.380	<0.001
QOL score	0.296	<0.001
IIEF-5 score	–0.158	0.032
AIS score	0.047	0.524

BMI, body mass index; IPSS, International Prostate Symptom Score; V, voiding subscore; S, storage subscore; QOL, quality of life; IIEF-5, International Index of Erectile Function-5; AIS, Athens Insomnia Scale.

International Prostate Symptom Score (IIEF-5) (20) was used to evaluate sexual function. The outpatient physicians were divided into two groups based on where they worked: the surgeon group and non-surgeon group. All data were anonymized.

Statistical analysis

SPSS 22.0 software was used for all statistical analyses. A *t*-test was used to compare the clinical data between groups and Spearman correlation was utilized to analyze the correlation between duration of outpatient duties and other collected indicators. All tests were bilateral. P<0.05 indicated statistical significance.

Results

General information and questionnaires

A total of 186 valid questionnaires were collected. The average duration of outpatient duties per week was 2.37±1.51 days. The average age was 36.1±4.42 years. The average BMI was 24.2±2.59 kg/m^2, and the average IPSS-Total score was 4.12±4.10. Additionally, the average IPSS-V score was 1.77±1.83, the average IPSS-S score was 2.34±2.69, the average IPSS-QOL was 1.42±1.30, and the average IIEF-5 score was 20.8±2.31. The average AIS score was 2.65±2.22.

Relationship between duration of outpatient duties and LUTS, sexual function, and sleep quality

The results of correlation between the duration of outpatient duties and other collected indicators showed that duration positively correlated with the IPSS-Total, IPSS-S, and QOL and negatively correlated with the IIEF-5 (*Table 1*). There was no significant correlation between duration and age, BMI, IPSS-V, and AIS scores. As illustrated in *Figure 2*, the IPSS-Total, IPSS-S, and IPSS-QOL scores increased significantly when duration was longer than 4 days.

Comparison of clinical data between surgeons and non-surgeons

The physicians were divided into the surgeon group (n=97) and non-surgeon group (n=89). The results showed that non-surgeons performed more outpatient responsibilities per week than surgeons (2.77±1.59 *vs.* 2.01±1.34; P<0.001). The IPSS-Total (P=0.016), IPSS-S (P=0.005), and QOL scores (P=0.046) of the non-surgeon group were higher, and the IIEF-5 scores were lower (P=0.039). There was no significant difference between the two groups with respect to age, BMI, and IPSS-V, and AIS scores (*Table 2*).

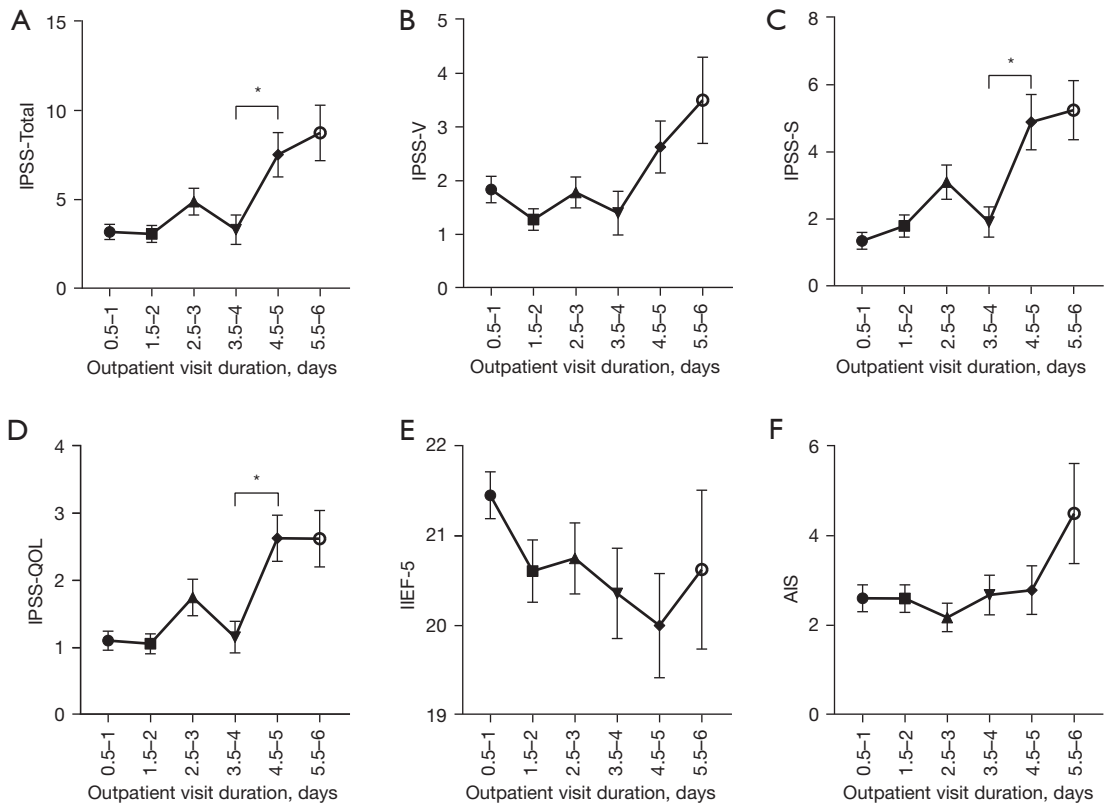

Figure 2 Correlation between different durations of outpatient duties and IPSS-Total (A), IPSS-V (B), IPSS-S (C), IPSS-QOL (D), IIEF-5 (E), and AIS (F). *, statistical difference between two groups of data. IPSS, International Prostate Symptom Score; V, voiding subscore; S, storage subscore; QOL, quality of life; IIEF-5, International Index of Erectile Function-5; AIS, Athens Insomnia Scale.

Table 2 Comparison of baseline characteristics between surgeons and non-surgeons

Variable	Surgeons (n=97) (SD)	Non-surgeons (n=89) (SD)	P value
Outpatient schedule (days)	2.01 (1.34)	2.77 (1.59)	<0.001
Age (years)	36.4 (4.41)	35.8 (4.43)	0.356
BMI (kg/m^2)	24.2 (2.60)	24.1 (2.59)	0.793
IPSS-Total	3.43 (3.38)	4.87 (4.67)	0.016
IPSS-V	1.61 (1.57)	1.96 (2.06)	0.192
IPSS-S	1.81 (2.33)	2.91 (2.93)	0.005
QOL score	1.24 (1.16)	1.62 (1.41)	0.046
IIEF-5 score	21.1 (2.13)	20.4 (2.45)	0.039
AIS score	2.39 (1.86)	2.93 (2.53)	0.097

BMI, body mass index; IPSS, International Prostate Symptom Score; V, voiding subscore; S, storage subscore; QOL, quality of life; IIEF-5, International Index of Erectile Function-5; AIS, Athens Insomnia Scale.

Discussion

The study achieved its expected aims to uncover the relationship between duration of outpatient duties and the occurrence and degree of LUTS, sexual dysfunction, and sleep disorders among young, male outpatient physicians and to determine the optimal duration of outpatient duties in tertiary medical centers in China. To our knowledge, this is the first study to explore this relationship. The issues examined in this study are determined by China's unique national conditions. In fact, there are only 13.6 medical doctors per 10,000 population in China, far below the global average (21). According to the *Chinese Physicians' Practice Status White Paper* released by the Chinese Medical Doctor Association in 2014, among physicians who worked on average >60 h/week, 57.27% were aged 25–35 years, 30.05% were aged 36–45 years, and 12.68% were aged 46–60 years. In addition, physicians in tertiary, secondary, and primary hospitals accounted for 72.43%, 23.77%, and 1.84%, respectively, of those who worked >60 h/week. From

January 2007 to December 2018, 110 Chinese physicians died of overwork, among whom the average age of male and female physicians was 41.74±8.75 years and 34.71±8.83 years, respectively; 78.18% of these physicians who died had worked in tertiary hospitals (22).

China has become a de facto aging society. By 2050, the proportion of those aged over 65 is expected to reach approximately 25% (23,24). In addition, the workload of health providers in the current public health system in China will continue to increase over time (25), exacerbated by the implementation of the two-child policy in China in 2016 (26). Furthermore, because of the uneven distribution of medical resources in China, high-quality medical resources are predominantly concentrated in tertiary medical centers located in capital cities. Therefore, patients often travel hundreds of miles to seek a better quality of medical treatment (27), but due to the limited number of physicians, tertiary hospitals are unable to treat so many patients. In various medical centers, young outpatient physicians need to admit 70–100 patients per day. Over the past 20 years, the working environment of physicians has worsened, and violence against physicians by patients and their families has been reported frequently (28-30). High-intensity and high-pressure workplaces could potentially lead to the deteriorating physical and mental health of Chinese physicians, especially those in large tertiary medical centers. In addition, due to the COVID-19 pandemic, Chinese doctors are also suffering from higher workload and greater psychological stress (31), which have been linked to LUTS (32).

Our results showed that the duration of outpatient duties per week positively correlated with the IPSS-Total and QOL scores, but not with AIS scores, indicating that the incidence of LUTS increases with increasing duration of outpatient duties. Sleep quality was not affected by the duration. The large number of outpatients and their complicated medical conditions may have contributed to the positive correlation of IPSS-Total and QOL scores and outpatient duties.

To complete their outpatient duties physicians are seated for long periods of time, leading to urinary retention. Several studies have shown that sedentary habits and prolonged holding of urination could induce LUTS (6,13,33). In addition, a negative correlation between physical exercise and LUTS has been reported (6,7,33), which suggests that outpatient physicians should exercise regularly to reduce the impact of sedentary habits and long-term urinary retention on the development of LUTS. Interestingly, duration of outpatient duties positively correlated with IPSS-S, but not with IPSS-V, which indicates that long-term the continuous outpatient visits predominantly affect the symptoms in the storage period rather than in the voiding period.

A weak negative correlation between the physicians' sitting time and their IIEF-5 scores was observed in this study, suggesting that sitting for prolonged periods of time might harm the erectile function of young, male outpatient physicians.

Since we showed a certain degree of sleep disturbance after actual long-term outpatient work, we considered that there may be a certain correlation between the degree of sleep disturbance and the duration of outpatient duties. The actual data analysis results do not support our hypothesis.

We divided the outpatient physicians into surgeon and non-surgeon groups based on their different departments. The non-surgeons had more outpatient duties per week than surgeons and they had higher IPSS-Total, IPSS-S, and IPSS-QOL scores but lower IIEF-5 scores. Further studies with large multicenter samples are required for analysis of the underlying reasons.

Finally, our findings indicated that as the duration of outpatient duties increased, the IPSS-Total and IPSS-S scores of the physicians increased. Physicians whose outpatient duties were 4 days or longer had an average IPSS score of 8, and those with a duration of 4.5–5 days experienced moderate LUTS, and significant differences were found in their data compared with the group with a duration less than 4 days. In addition, regarding those with duration of outpatient duties >4 days, significant statistical differences in IPSS, IPSS-S, and IPSS-QOL scores were observed in those with longer durations. Hence, this study suggests that the duration of outpatient duties of male physicians in China's large tertiary medical centers should not be longer than 4 days a week.

This cross-sectional study had a few limitations. First, only 186 questionnaires from three large tertiary medical centers in Changsha, Hunan Province, were counted, so there may be selection bias and further studies of large multicenter samples are needed for evaluation. Third, additional comprehensive data should be collected for analysis in future research, such as physicians' smoking habits, drinking habits, marital status, work intensity beyond the clinic, and so on.

Conclusions

A positive correlation between outpatient duties' duration

and LUTS in the IPSS urinary storage subscale was observed; however, a weak negative correlation between duration and the IIEF-5 score was also found. Compared with surgeons, non-surgeons experience more severe LUTS and sexual dysfunction, which suggests that outpatient duties maybe should not be longer than 4 days/week. Further experimental and comparative studies are needed to verify the hypothesis.

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Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://tau.amegroups.com/article/view/10.21037/tau-22-544/rc

Data Sharing Statement: Available at https://tau.amegroups.com/article/view/10.21037/tau-22-544/dss

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://tau.amegroups.com/article/view/10.21037/tau-22-544/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the ethics committee of the Xiangya Hospital of Central South University (No. 201703545), and written informed consent was obtained from all participants. Both participating hospitals were informed and agreed the study.

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Appendix 1 Outpatient Doctors Survey

Thanks for entering this questionnaire in your busy schedule. This questionnaire is a questionnaire initiated by the General Urology team of Xiangya Hospital of Central South University. The data in this questionnaire will not be used for purposes other than scientific research, and the identity of the respondent cannot be known in the background. The questionnaire takes 3-5 minutes. Please be sure to answer according to your actual situation. Thanks for your support.

1. Your gender [multiple choice]
   - ○ Male
   - ○ Female

2. Your age [fill in the blank question]

_____

3. Your height (cm) [fill in the blank question]

_____

4. Your weight (kg) [fill in the blank question]

_____

5. Your department [multiple choice]
   - ○ Surgeon
   - ○ Non surgeon

6. Your marital status [multiple choice]
   - ○ Married
   - ○ Unmarried
   - ○ Divorced

7. How long do you sit in an outpatient clinic each week? [multiple choice]
   - ○ 0 day
   - ○ 0.5 day
   - ○ 1 days
   - ○ 1.5 days
   - ○ 2 days
   - ○ 2.5 days
   - ○ 3 days
   - ○ 3.5 days
   - ○ 4 days
   - ○ 4.5 days
   - ○ 5 days
   - ○ 5.5 days
   - ○ 6 days

8. Do you smoke? [multiple choice]
   - ○ Yes
   - ○ No

9. Do you drink [multiple choice]
   - ○ Yes
   - ○ No

10. Do you have one of the following conditions: history of urinary tract infections, urethral stricture, benign prostatic hyperplasia, urinary tract tumor, urological surgery history or trauma, neurogenic bladder dysfunction, and known

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urinary system malignant diseases [multiple choice]
○ Yes
○ No

11. During the last month or so, how often have you had a sensation of not emptying your bladder completely after you finished urinating? [multiple choice]
○ Not at all
○ Less than 1 time in 5
○ Less than half the time
○ About half the time
○ More than half the time
○ Almost always

12. During the last month or so, how often have you had to urinate again less than 2 hours after you finished urinating? [multiple choice]
○ Not at all
○ Less than 1 time in 5
○ Less than half the time
○ About half the time
○ More than half the time
○ Almost always

13. During the last month or so, how often have you found you stopped and started again several times when you urinated? [multiple choice]
○ Not at all
○ Less than 1 time in 5
○ Less than half the time
○ About half the time
○ More than half the time
○ Almost always

14. During the last month or so, how often have you found it difficult to postpone urination? [multiple choice]
○ Not at all
○ Less than 1 time in 5
○ Less than half the time
○ About half the time
○ More than half the time
○ Almost always

15. During the last month or so, how often have you had a weak urinary stream? [multiple choice]
○ Not at all
○ Less than 1 time in 5
○ Less than half the time
○ About half the time
○ More than half the time
○ Almost always

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16. during the last month or so, how often have you had to push or strain to begin urination? [multiple choice]
    - ○ Not at all
    - ○ Less than 1 time in 5
    - ○ Less than half the time
    - ○ About half the time
    - ○ More than half the time
    - ○ Almost always

17. During the last month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning? [multiple choice]
    - ○ None
    - ○ 1 time
    - ○ 2 times
    - ○ 3 times
    - ○ 4 times
    - ○ 5 or more times

18. If you were to spend the rest of your life with your prostate symptoms just as they are now, how would you feel about that? [multiple choice]
    - ○ Delighted
    - ○ Pleased
    - ○ Mostly satisfied
    - ○ Mixed (about equally satisfied and dissatisfied))
    - ○ Mostly dissatisfied
    - ○ Unhappy
    - ○ Terrible

19. Sleep induction (time it takes you to fall asleep after turning off the lights) [multiple choice]
    - ○ No problem
    - ○ Slightly delayed
    - ○ Markedly delayed
    - ○ Very delayed or did not sleep at all

20. Awakenings during the night [multiple choice]
    - ○ No problem
    - ○ Minor problem
    - ○ Considerable problem
    - ○ Serious problem or did not sleep at all

21. Final awakening earlier than desired [multiple choice]
    - ○ Not earlier
    - ○ A little earlier
    - ○ Markedly earlier
    - ○ Much earlier or did not sleep at all

22. Total sleep duration [multiple choice]
    - ○ Sufficient
    - ○ Slightly insufficient
    - ○ Markedly insufficient

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- ○ Very insufficient or did not sleep at all

23. Overall quality of sleep (no matter how long you slept) [multiple choice]
    - ○ Satisfactory
    - ○ Slightly unsatisfactory
    - ○ Markedly unsatisfactory
    - ○ Very unsatisfactory or did not sleep at all

24. Sense of well-being during the day [multiple choice]
    - ○ Normal
    - ○ Slightly decreased
    - ○ Markedly decreased
    - ○ Very decreased

25. Functioning (physical and mental) during the day [multiple choice]
    - ○ Normal
    - ○ Slightly decreased
    - ○ Markedly decreased
    - ○ Very decreased

26. Sleepiness during the day [multiple choice]
    - ○ None
    - ○ Mild
    - ○ Considerable
    - ○ Intense

27. How do you rate your confidence that you could get and keep an erection? [multiple choice]
    - ○ Very low
    - ○ Low
    - ○ Moderate
    - ○ High
    - ○ Very high

28. When you had erections with sexual stimulation how often were vour erections hard enough for penetration? [multiple choice]
    - ○ Almost never/never
    - ○ A few times (much less than half the time)
    - ○ Sometimes (about half the time)
    - ○ Most times (much more than half the time)
    - ○ Almost always/always

29. During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner? [multiple choice]
    - ○ Almost never/never
    - ○ A few times (much less than half the time)
    - ○ Sometimes (about half the time)
    - ○ Most times (much more than half the time)
    - ○ Almost always/always

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30. During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse? [multiple choice]
    - ○ Extremely difficult
    - ○ Very difficult
    - ○ Difficult
    - ○ Slightly difficult
    - ○ Not difficult

31. When you attempted sexual intercourse, how often was it satisfactory for you? [multiple choice]
    - ○ Almost never/never
    - ○ A few times (much less than half the time)
    - ○ Sometimes (about half the time)
    - ○ Most times (much more than half the time)
    - ○ Almost always/always

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