Latent Heterogeneity in Short-Term Trajectories of Sleep Disturbance in Family Caregivers

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Background: Growing attention in the past decades has focused on long term care due to the rapidly increased elderly population in Taiwan. The need of long term care services therefore has dramatically increased. The Aging in Place policy is suitable for Chinese culture, however, a number of different services designed to support family caregivers in the community are not enough for their needs. Hence, taking care responsibilities are heavily relied on the family caregivers. Research has documented that providing care to the dependent family members can make the caregivers themselves more vulnerable to physical, emotional, and social problems. These problems influence sleep quality of family caregivers. Sleep quality is a continuous dynamic process. However, changes in their sleep patterns and related characteristics over time remain unclear. Distinct patterns of sleep change over time will provide a better understanding of different caregiver subgroups, helping to identify which caregivers to target for the intervention study for the future.

Objectives: We adopted longitudinal study design to explore the sleep patterns of family caregivers.

Research methods: Family caregivers of dependent elderly patients from a prospective panel study of 124 were recruited and surveyed from the community between August 2016 and July 2017. The sleep data were obtained from four waves (the interval of each wave was 3 months) using the Pittsburgh Sleep Quality Index via multiple home visits.

The time variable for defining sleep trajectories was measured in months. Month 0 (Time 1) was set as the day of study panel enrollment. Thus, the number of study months on which sleep measurements were obtained in varied for each participant. Thus, four mutually exclusive trajectory time points were used for developing the trajectories. A total of 39 caregivers were deleted as the timing of one or more of their 4 interviews disallowed inclusion in the specified trajectory time points. Length of time on protocol and number of 3-monthly measurements were limited to one year. Thus, the analysis panel comprised 85 caregiver, while 124 caregivers contributed to T1, 107, 86, and 85 caregivers contributed to T2, T3 and T4, respectively; 85 caregivers contributed to all the four time points. There was no significant difference in values of predictor variables or T0 value of time-varying covariates.

The time-constant and time-varying covariates were collected on participants’ demographic data, trait anxiety, psychological distress, caregiver burden, and social support. Growth curve modeling (GCM) and growth mixture modeling (GMM) were employed to identify group-based trajectory modeling for those 85 participants who completed the four-wave survey. Descriptive analyses were conducted using SPSS, and Mplus 8 was used for GCM and GMM.

Results:

Descriptive Characteristics of the Study Sample

In the sample of 124 participants at the first Time, 64.5% were female. The mean age was 51.89 years (SD = 12.67). Over 70% of the sample reported having a should/neck/back pain due to taking care of the patients. Based on the cutoffs of sleep quality scores, 75.8% of the participants were considered to have poor sleep quality. Sleep was significantly associated with gender, trait anxiety, depressive mood, social support and caregiver burden (all p < 0.01) at the first Wave survey.
Latent Class Findings: Results of GMM analysis

We identified two distinct trajectories: progressively better sleep (69.4%) and progressively worse sleep (30.6%). Sleep was significantly associated with gender, trait anxiety, depressive mood, social support, and caregiver burden at the first Wave survey. At 12 months survey, participants classified as progressively worse sleepers showed a trend toward women caregivers and lower level of social support (p < 0.05) than those with progressively better sleep.

Discussion: The current study results necessitate that sleep improvement intervention be customizable, so that a variety of individual differences can be incorporated into them. The identified predictor of class membership could assist health care providers with targeting interventions designed to improve sleep quality among vulnerable adult family caregiver populations. For sleep quality to be effectively improved, sleep management strategies should be tailored to the gender issue and social support of the target caregivers. In relation to improve sleep quality, policymakers should focus especially on female and less social support. The GMM presented in this study could offer a practical tool for distinguishing between the subgroups of a population and therefore facilitate a patients-centered approach in sleep improvement strategies. Further studies should consider more specific personal, social, and environmental factors so as to gain insight into all of the complexities of sleep quality. Future research should develop different intervention strategies for the different subgroups of poor sleepers.

Conclusion: Family caregivers of dependent elderly patients had two distinct sleep trajectories during the whole year of survey. These poor-sleep courses were associated with gender and social support. Our findings provided evidence for health care administrators and providers using target-focused and evidence-based intervention to improve sleep in caregivers. The study findings enabled us to advance knowledge and further research about caregivers’ longitudinal patterns of sleep.

Title:
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**Abstract Summary:**
Sleep quality of family caregivers is a dynamic process and changes over time. However, little is known about the information on the factors that predict longitudinal sleep patterns of caregivers. By using growth mixture modeling (GMM), we identified two distinct trajectories and its influencing factors.

**Content Outline:**
1. Introduction
   (1) Prevalence of caregivers psychophysiological health.
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2. Method
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4. Discussion:
   (1) Compare and contrast of the results
   (2) Limitation of the study
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5. Conclusion

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