The Mediating Role of Sleep on the Associations between Childhood Maltreatment Types and Later Life Health Conditions

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Extant research demonstrates associations between childhood maltreatment and health in adulthood.

These health issues include chronic physical health problems such as diabetes, heart disease, gastrointestinal troubles, etc. and mental health problems such as anxiety and depression (Arnow, 2004).

Less is known about the association between maltreatment and functional disability status in adulthood, even though loss of functional status is a problem that affects a large proportion of the aging population.

Moreover, there is growing evidence for positive associations between physical health conditions and depression and functional disability status among adults (Chatterji et al., 2015; Travis et al., 2004).
Several lifestyle factors are associated with the development of chronic physical health problems, depression, and disability.

One such lifestyle factor is sleep and poor sleep is associated with higher levels of depression (Paunio et al., 2015), physical health problems (Liu et al., 2013), and disability in adulthood (Friedman, 2016).

Even though experiences of childhood maltreatment are associated with poor sleep in later life (Bader, 2007), few studies have examined sleep as a potential mechanism between childhood maltreatment types and health in adulthood.
Objectives

• One study by Chioun Lee & associates (2014) examined the role of childhood maltreatment and physical health conditions via subjective sleep.

• The present study extends this previous work by examining subjective sleep as a mechanism between retrospective reports of childhood maltreatment types and multiple domains of health in adulthood: chronic physical health problems, depression and disability, simultaneously. Additionally, this study uses a longitudinal panel analysis to evaluate cascading effects over-time.
• Data for this study come from the survey dataset Midlife Development in the U.S. (MIDUS). MIDUS is a longitudinal panel dataset with three waves of assessment collected approximately every 10 years and the age range for participants at baseline was 25-75 years.

• At baseline assessment, a national probability sample of individuals were selected via random digit dialing (N = 3,487), and sample of their siblings (N = 950) were also included. The study also included a nationally representative sample of twins (N =1914) and a metropolitan over-sample from five areas (N = 757).

• A subsample of 1003 individuals was used in this research who answered both the telephone interview and the self-administered questionnaire.
Subjective Sleep Measure: The **Pittsburgh Sleep Quality Inventory** (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) consists of six domains subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, daytime dysfunction, and use of sleep medication. The domains were aggregated to create a single global sleep dimension ranging from **0-21.** (Scores over 5 are indicative of pathology)
MEASURES (TIME 2)

- **subjective sleep quality:** Eg “During the past month, how would you rate your sleep quality overall:

- **sleep latency:** Eg “During the past month, how long (in minutes has it taken you to fall asleep at night?”

- **sleep duration:** Eg “During the past month, how many hours of actual sleep did you get at night”

- **habitual sleep efficiency:** Eg “During the past month, how many hours of actual sleep did you get at night”

- **sleep disturbance:** Eg “Woke up in the middle of the night or early in the morning”

- **use of sleep medication:** Eg “During the past month, how often have you taken medicine (prescribed or “over the counter”) to help you sleep?

- **daytime dysfunction:** Eg “During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?”
**MEASURES (TIME 2)**

- Maltreatment Types: *Retrospective reports on the Childhood Trauma Questionnaire* (Bernstein & Fink, 1998). 3 items were used for each maltreatment type. Responses: 1 (“Never”) – 4 (“A lot”)

- Confirmatory factor measurement models were used to assess retrospective childhood maltreatment types. These models improve construct reliability by extracting measurement error.

- Since the three item constructs were just identified, race was used to predict the constructs in order to have an over-identified model and get model fit indices.
MEASURES (TIME 2)

Items for Neglect: CFI = 0.995, TLI = 0.985, RMSEA = 0.023, $\chi^2 = 3.11$ (ns)
- **Item 1:** I didn’t have enough to eat. $\beta$ = 0.60 ; $R^2 = 0.36$
- **Item 2:** I knew that there was someone to take care of me and protect me [reverse coded]. $\beta$ = 0.53 ; $R^2 = 0.28$
- **Item 3:** There was someone to take me to the doctor if I needed it [reverse coded]. $\beta$ = 0.74 ; $R^2 = 0.55$

Items for Emotional Abuse: CFI = 0.996, TLI = 0.989, RMSEA = 0.029, $\chi^2 = 2.36$ (ns)
- **Item 1:** People in my family called me things like “stupid,” “lazy,” or “ugly”. $\beta$ = 0.76 ; $R^2 = 0.57$
- **Item 2:** People in my family said hurtful or insulting things to me. $\beta$ = 0.93 ; $R^2 = 0.86$
- **Item 3:** I believe that I was emotionally abused. $\beta$ = 0.72 ; $R^2 = 0.51$

Items for Physical Abuse: CFI = 0.996, TLI = 0.989, RMSEA = 0.029, $\chi^2 = 3.73$ (ns)
- **Item 1:** People in my family hit me so hard that it left me with bruises or marks. $\beta$ = 0.89 ; $R^2 = 0.79$
- **Item 2:** I believe that I was physically abused. $\beta$ = 0.83 ; $R^2 = 0.69$
- **Item 3:** I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor. $\beta$ = 0.65 ; $R^2 = 0.42$
MEASURES (TIME 2)

Items for Sexual Abuse: CFI = 0.988, TLI = 0.963, RMSEA = 0.053, $\chi^2 = 2.36$ (p = 0.02)

- **Item 1:** Someone tried to touch me in a sexual way, or tried to make me touch them. $\beta = 0.88$; $R^2 = 0.77$
- **Item 2:** Someone molested me. $\beta = 0.97$; $R^2 = 0.94$
- **Item 3:** I believe that I was sexually abused. $\beta = 0.94$; $R^2 = 0.88$

Covariates: Age, Race, Sex, Educational Attainment, Marital Status, and Health Conditions at Time 2 (Chronic Health Conditions, Depression and Disability)
Chronic Physical Health Conditions: *(Y = 1 and N = 0 if experienced the following in last 12 months)*

1. ASTHMA/BRONCHITIS/EMPHYSEMALUNG PROBLEMS
2. JOINT/BONE DISEASES EVER
3. STOMACH TROUBLE EVER/GASTROINTESTINAL PROBLEMS
4. SCIATICA/LUMBAGO/BACKACHE EVER
5. URINARY/BLADDER PROBLEM EVER
6. HIGH BLOOD PRESS/HYPERTENSION EVER
7. MIGRAINE HEADACHES EVER
8. DIABETES/HIGH BLOOD SUGAR EVER
9. STROKE EVER
10. ULCER EVER
11. OBESITY

Depression: Recent Care of Common Mental Disorder in the United States: Prevalence and Conformance with Evidence-Based Recommendations *(Wang, Berglund, & Kessler, 2000)*.

[Two weeks in past 12 months] 1= Yes, 0 = No. Range 0-7
• Functional Disability Status: Combined response on Activities of Daily Living or ADLs ("Bathing or Dressing Oneself"; “Walking a block”) and Instrumental ADLS or IADLS (“Lifting or carrying groceries”; “Climbing several flights of stairs”; “Bending, kneeling, or stooping”; “Walking more than a mile”; “Walking several blocks”; “vigorous activities such as running”; and moderate activities such as Responses: “1 = A lot”; “2 = Some”; “3 = A little”; “4 = Not at all” [Reverse Coded]

Range: 9-36

MEASURES (TIME 3, 10 YEARS AFTER TIME 2)
General Analytic Strategy

• Model 1: Confirmatory factor measurement models were used to assess retrospective childhood maltreatment types. These models improve construct reliability by extracting measurement error.

• Model 2: Direct Association between maltreatment types and health outcomes (disability, physical health problems, and depression). Adjusted for age, race, gender, marital status, education attainment and previous levels of health conditions (at time 2).

• Model 3: Direct Associations of Model 2 and Indirect Association between maltreatment types and health outcomes via Sleep. Adjusted for age, race, gender, marital status, education attainment and previous levels of health conditions (at time 2).

• All models were corrected for clustering of individuals within family.
Figure. Childhood Neglect Predicting Health Problems in Adulthood via Sleep.
(Note: Outcomes adjusted for covariates).
Figure. Childhood Emotional Abuse Predicting Health Problems in Adulthood via Sleep.
(Note: Outcomes adjusted for covariates).

- Indirect Effect for Disability: $\beta = 0.02^{***}$
- Indirect Effect for Chronic Health Problems: $\beta = 0.03^{***}$
- Indirect Effect for Depression: $\beta = 0.03^{***}$
Physical Abuse

Depression

Chronic Health Problems

Disability

Subjective Sleep Quality

• Indirect Effect for Disability: $\beta = 0.01^{**}$
• Indirect Effect for Chronic Health Problems: $\beta = 0.02^{**}$
• Indirect Effect for Depression: $\beta = 0.02^{**}$

Figure. Childhood Physical Abuse Predicting Health Problems in Adulthood via Sleep. (Note: Outcomes adjusted for covariates).
Figure 2. Childhood Sexual Abuse Predicting Health Problems in Adulthood via Sleep. (Note: Outcomes adjusted for covariates).
KEY FINDINGS

1. Childhood maltreatment types impact sleep problems. More severe maltreatment exposure in childhood is associated with more sleep pathology in adulthood.

2. Higher levels of sleep pathology is associated with more health problems.

3. There is an indirect effect of childhood maltreatment types and health problems in adulthood via sleep.
   
    I. The mediation is partial for emotional and sexual abuse. Full mediation for neglect and physical abuse.

    II. The indirect effects are stronger for neglect and emotional abuse compared to sexual and physical abuse domains of maltreatment.

    III. The indirect effects for emotional abuse and neglect are comparable.
IMPLICATIONS

• The current study has implications for future intervention: Providing sleep therapy to individuals with a history of childhood maltreatment could be important to prevent the long-term health consequences associated with childhood maltreatment.

• Additionally, the effects of childhood neglect and emotional abuse on health outcomes in adulthood via sleep are stronger compared to the effects of physical and sexual abuse. This is important because even though neglect has been the most prevalent form of childhood maltreatment type, it is relatively understudied.

• The majority of studies have focused on physical and sexual abuse but it is likely that the less intrusive forms and more chronic forms of maltreatment such as neglect and emotional abuse may have stronger effects on lifestyle problems (such as sleep problems).

• The nationally representative, prospective longitudinal sample used in this study allows for population level inferences.
LIMITATIONS AND FUTURE DIRECTIONS

• There are several limitations to this study: self report on all measures, lack of sample diversity, possibility of bi-directional associations, small effect sizes.

• Explore other potential health behaviors and lifestyle factors or psycho-social resources that could explain differences between individuals in their outcomes or act as buffers.
THANK YOU