

中国老年人睡眠状况对抑郁的影响：自评健康的中介作用

刘 婷

山东大学齐鲁医学院公共卫生学院流行病学系, 山东 济南

收稿日期: 2024年3月19日; 录用日期: 2024年4月13日; 发布日期: 2024年4月23日

摘 要

目的: 抑郁是老年人较常见的负面影响, 睡眠情况不佳显著影响抑郁的发生发展。然而, 将睡眠情况与抑郁联系起来的潜在中介机制仍不清楚。本研究旨在探讨: 1) 睡眠情况与抑郁之间的关联; 2) 自评健康在睡眠情况和抑郁之间关联的中介作用, 为预防晚年抑郁症提供理论依据。方法: 数据来源于2018年北京大学开展的“中国老年健康与家庭幸福调查”。睡眠时间、睡眠质量、自评健康和抑郁评分均通过问卷收集。抑郁评分范围为0~30分, 得分越高表明抑郁症状越严重, 总分 ≥ 10 分被定义为临床上显著的抑郁症状。结果: 在控制了潜在的混杂因素后, 发现睡眠情况不佳与抑郁症状显著正相关。中介分析显示, 自评健康在睡眠情况不佳与和抑郁之间的关联中起到了中介作用。结论: 睡眠时间不足和睡眠质量不佳均会引起老年人患抑郁症的风险增加, 通过改善睡眠情况以提高老年人自评健康水平, 有望降低抑郁症的发生风险。

关键词

抑郁症, 睡眠质量, 睡眠时间, 自评健康, 中介效应, 老年人

The Effect of Sleep Status on Depression in Chinese Elderly: The Mediating Role of Self-Rated Health

Ting Liu

Department of Epidemiology, School of Public Health, Cheeloo College of Medicine, Shandong University, Jinan Shandong

Received: Mar. 19th, 2024; accepted: Apr. 13th, 2024; published: Apr. 23rd, 2024

Abstract

Objective: Depression is a more common negative effect among elderly, and poor sleep situation

文章引用: 刘婷. 中国老年人睡眠状况对抑郁的影响: 自评健康的中介作用[J]. 临床医学进展, 2024, 14(4): 1529-1540.
DOI: 10.12677/acm.2024.1441188

significantly influences the development of depression. However, the potential mediating mechanisms linking sleep situation to depression remain unclear. The aim of this study was to investigate 1) the association between sleep situation and depression and 2) the mediating role of self-rated health in the association between sleep situation and depression to provide a theoretical basis for the prevention of depression in later life. **Methods:** The data were obtained from the 2018 Peking University Survey on Chinese Longitudinal Healthy Longevity Survey. Sleep duration, sleep quality, self-rated health and depression scores were collected by questionnaire. Depression scores ranged from 0 to 30, with higher scores indicating more severe depressive symptoms, and a total score of ≥ 10 was defined as clinically significant depressive symptoms. **Results:** After controlling for potential confounders, poor sleep situation was found to be significantly and positively associated with depressive symptoms. Mediation analyses showed that self-rated health mediated the association between sleep situation and depression. **Conclusions:** Inadequate sleep duration and poor sleep quality both cause an increased risk of depression in older adults, and improving self-rated health by improving sleep is expected to reduce the risk of depression in older adults.

Keywords

Depression, Sleep Quality, Sleep Duration, Self-Rated Health, Mediating Effect, The Elderly

Copyright © 2024 by author(s) and Hans Publishers Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



1. 引言

抑郁症被定义为一种多维度的异质性疾病，对个人的身体健康、生活质量和社会心理功能产生负面影响，并可能导致残疾和死亡[1] [2] [3]。如今，抑郁症已成为影响人们健康的第二大风险因素，全球约有 3.5 亿人患有抑郁症[4]，而且这个数字正在迅速增长。在老年人群中，抑郁症已成为仅次于阿尔茨海默症的第二大精神障碍[5]，中国老年人群的抑郁症状患病率为 20.0% (95% CI: 17.5%~22.8%)，平均每 5 个老年人中就有一位罹患抑郁症[6]。老年抑郁症给患者、家庭和整个社会带来了巨大的负担，据报道，有约 80% 的老年人因抑郁症而自杀[7]。现实情况表明，老年抑郁症已成为老龄化社会的公共卫生难题，关注与应对老年人抑郁症已成为积极应对人口老龄化的一项紧迫任务。

睡眠障碍的患病率随着年龄的增长而增加，我国约有 47.2% 的老年人存在睡眠障碍[8]。现有研究表明有睡眠问题的人更容易患上抑郁症，一项评估睡眠情况和晚年抑郁症关联的纵向研究发现，抑郁症与睡眠障碍密切相关：在 40%~90% 被诊断为抑郁症的受试者中，观察到睡眠质量差的抱怨[9] [10]。睡眠障碍是用于诊断抑郁症的临床算法的一部分，并且有越来越多的证据表明睡眠障碍先于抑郁症，一些长期追踪的研究发现，睡眠障碍在抑郁症发病前数年就可能出现[11] [12] [13]，睡眠障碍可能是抑郁症的一个先兆，或者是抑郁症风险的标志之一。此外，Lopresti 等人[14]发现睡眠在抑郁症的发生、发展和治疗中起着重要的中介作用。

综上所述，睡眠障碍的人更容易患上抑郁症，但睡眠情况与抑郁症状之间关系的潜在机制尚不完全清楚。因此，本研究基于全国性的老年人群健康调查队列，旨在探索睡眠情况与抑郁症状之间的关联及潜在机制，找寻潜在的可改变因素，为预防晚年抑郁症提供依据。

2. 对象与方法

1) 研究对象：数据来自中国老年健康与家庭幸福调查(Chinese Longitudinal Healthy Longevity Survey,

CLHLS), 该团队于 1998~2018 年在全国 23 个省、直辖市和自治区随机抽取约半数县市开展了 8 次调查, 共访谈 11.3 万户, 所有研究对象均自愿签署知情同意书, 数据质量获得了国内外学者的评估和普遍认可。本研究选择在 2018 年纳入研究的 15,874 名 65~105 岁老年人群, 在排除抑郁($n = 1282$)、睡眠情况及婚姻状况等自变量($n = 4273$)缺失的受访者后, 最终共 10,319 名受访者纳入分析。本研究获得北京大学伦理审查委员会的批准(批号: IRB00001052-13074), 所有参与者均签署了书面知情同意书。

2) 睡眠情况: 问卷中通过询问: “您现在一般每天睡几小时?” 收集受访者的睡眠时间。根据国家睡眠基金会的建议, 参与者被分为 <7 小时、7~9 小时和 >9 小时三组, 其中睡眠时间 7~9 小时为参照组。睡眠质量通过询问: “您现在睡眠质量如何?” 进行评估[15], 回答包括: “很好” “好” “一般” “差” 和 “很差”。本研究首先将睡眠质量分为 “较好” (好/很好)、 “一般” 和 “较差” (差/很差) 三组, 并将睡眠质量较好作为参照组。在进行中介分析时, 将睡眠时间分为正常睡眠时间(7~9 h)和异常睡眠时间(<7 h 或 >9 h) 两组, 将睡眠质量分为 “理想” (好/很好) 和 “不理想” (一般/差/很差) 两组, 这种二分类的方法在其他与睡眠相关的研究中已经进行了验证[16] [17]。

3) 抑郁症状: 老年人的抑郁症状使用简明版的流行病学研究中心抑郁量表(Center for Epidemiological Survey Depression Scale, CES-D10)进行评估, 以往的研究已经证实该量表具有良好的效度和信度[18]。该量表分数从 0 到 30 分, 得分越高代表抑郁症状越严重[19], 总分 ≥ 10 被定义为临床上显著的抑郁症状[20]。

4) 中介变量: 自评健康是本研究的中介变量, 通过询问受访者 “您觉得现在您自己的健康状况怎么样?” 进行评估, 对这一问题的回答类别包括 “很好” “好” “一般” “不好” 或 “很不好”。本研究将自评健康分为 “好” (很好/好/一般) 和 “差” (不好/很不好)。自评健康状况已被确定为一个可靠的健康预测指标, 并已广泛应用于健康研究领域[21]。

5) 协变量: a) 社会人口学基本特征, 包括年龄、性别、婚姻状况、居住地; b) 生活方式和健康行为, 包括吸烟情况、饮酒情况、锻炼情况; c) 社会经济地位, 包括教育水平、家庭年收入。

6) 统计学分析:

使用 R 软件 4.4.4 进行统计分析。连续性变量采用均数 \pm 标准差表示, 采用方差分析比较组间差异; 分类变量采用 n (%) 描述, 采用 χ^2 检验比较组间差异。调整性别、年龄、教育水平、婚姻状况、居住地、家庭年收入、自评健康、吸烟情况、饮酒情况和锻炼情况后, 采用协方差分析比较不同组别间抑郁评分的差异, 采用多因素 logistic 回归模型分析老年人睡眠情况与抑郁症状的关联。同时按性别进行分层分析。采用双侧检验, 检验水准 $\alpha = 0.05$ 。

使用 R 软件 4.4.4 中的 bruceR 包测试了中介模型(见图 1、图 2)。具体来说, 研究了自评健康对睡眠情况和抑郁症状之间关联的中介作用。Bootstrap 方法用于检查中介效应的统计显著性, 它生成抽样分布的近似值以获得间接效应的置信区间。

3. 结果

1) 基本情况: 10,319 位受访者中, 男性占 45.0% (4649 名)。不同睡眠时间、睡眠质量的受访者均在婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况等方面存在显著差异($P < 0.05$), 在居住地方面的组间差异无统计学意义($P > 0.05$), 具体见表 1。

2) 不同睡眠状况老年人的抑郁评分情况

a) 调整性别、年龄、婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况后, 睡眠质量一般和睡眠质量较差的受访者抑郁评分高于睡眠质量较好的受访者(10.96 ± 4.96 、 13.30 ± 5.86 vs 7.35 ± 4.59)。在对性别组进行分层分析后, 结果一致。具体见表 2。

Table 1. Basic information on the study population**表 1.** 研究对象的基本情况

	总体 (n = 10,319)	睡眠质量			P 值	睡眠时间			P 值
		较好 (n = 5365)	一般 (n = 3371)	较差 (n = 1583)		<7 h (n = 3849)	7~9 h (n = 4599)	>9 h (n = 1871)	
性别									
男	4649 (45.0)	2698 (50.3)	1408 (41.8)	543 (34.3)	<0.001	1547 (40.2)	2235 (48.6)	867 (46.3)	<0.001
女	5670 (55.0)	2667 (49.7)	1963 (58.2)	1040 (65.7)		2302 (59.8)	2364 (51.4)	1004 (53.7)	
年龄									
65~80 岁	4305 (41.7)	2276 (42.4)	1358 (40.3)	671 (42.4)	0.024	1673 (43.5)	2196 (47.8)	436 (23.3)	<0.001
81~95 岁	4056 (39.3)	2045 (38.1)	1365 (40.5)	646 (40.8)		1538 (40.0)	1685 (36.6)	833 (44.5)	
96~105 岁	1958 (19.0)	1044 (19.5)	648 (19.2)	266 (16.8)		638 (16.5)	718 (15.6)	602 (32.2)	
受教育									
否	4710 (45.6)	2272 (42.3)	1634 (48.5)	804 (50.8)	<0.001	1847 (48.0)	1839 (40.0)	1024 (54.7)	<0.001
是	5609 (54.37)	3093 (57.7)	1737 (51.5)	779 (49.2)		2002 (52.0)	2760 (60.0)	847 (45.3)	
居住地									
农村	6103 (59.1)	3205 (59.7)	1961 (58.2)	937 (59.2)	0.535	2272 (59.0)	2761 (60.0)	1070 (57.2)	0.106
城镇	4216 (40.9)	2160 (40.3)	1410 (41.8)	646 (40.8)		1577 (41.0)	1838 (40.0)	801 (42.8)	
婚姻状况									
有同居人	4454 (43.2)	2389 (44.5)	1414 (41.9)	651 (41.1)	0.013	1662 (43.2)	2220 (48.3)	572 (30.6)	<0.001
无同居人	5865 (56.8)	2976 (55.5)	1957 (58.1)	932 (58.9)		2187 (56.8)	2379 (51.7)	1299 (69.4)	
家庭年收入									
<10,000	2952 (28.6)	1366 (25.5)	1067 (31.6)	519 (32.8)	<0.001	1244 (32.3)	1205 (26.2)	503 (26.9)	<0.001
10,001~50,000	3335 (32.3)	1840 (34.3)	1027 (30.5)	468 (29.6)		1169 (30.4)	1525 (33.2)	641 (34.3)	
>50,000	4032 (39.1)	2159 (40.2)	1277 (37.9)	596 (37.6)		1436 (37.3)	1869 (40.6)	727 (38.8)	
饮酒									
是	1528 (14.8)	929 (17.3)	411 (12.2)	188 (11.9)	<0.001	505 (13.1)	743 (16.2)	280 (15.0)	<0.001
否	8791 (85.2)	4436 (82.7)	2960 (87.8)	1395 (88.1)		3344 (86.9)	3856 (83.8)	1591 (85.0)	
吸烟									
是	1583 (15.3)	950 (17.7)	439 (13.0)	194 (12.3)	<0.001	505 (13.1)	768 (16.7)	310 (16.6)	<0.001
否	8736 (84.7)	4415 (82.3)	2932 (87.0)	1389 (87.7)		3344 (86.9)	3831 (83.3)	1561 (83.4)	
锻炼									
是	3473 (33.7)	1998 (37.2)	979 (29.0)	496 (31.3)	<0.001	1239 (32.2)	1727 (37.6)	507 (27.1)	<0.001
否	6846 (66.3)	3367 (62.8)	2392 (71.0)	1087 (68.7)		2610 (67.8)	2872 (62.4)	1364 (72.9)	
自评健康									
健康	8865 (85.9)	4905 (91.4)	2883 (85.5)	1077 (68.0)	<0.001	3106 (80.7)	4122 (89.6)	1637 (87.5)	<0.001
不健康	1454 (14.1)	460 (8.6)	488 (14.5)	506 (32.0)		743 (19.3)	477 (10.4)	234 (12.5)	

Table 2. Relationship between sleep quality and depression scores in the older population aged 65 years and over
表 2. 65 岁及以上老年人群睡眠质量与抑郁得分的关系

	模型 1			模型 2		
	均数 ± 标准差	F 值	P	均数 ± 标准差	F 值	P
总体						
较好	7.35 ± 4.59			7.36 ± 4.59		
一般	10.96 ± 4.96*	1084.97	<0.001	10.96 ± 4.96*	654.21	<0.001
较差	13.30 ± 5.86*			13.30 ± 5.86*		
男性						
较好	7.11 ± 4.50			7.11 ± 4.50		
一般	10.78 ± 4.88*	513.32	<0.001	10.78 ± 4.88*	318.95	<0.001
较差	13.22 ± 5.93*			13.22 ± 5.93*		
女性						
较好	7.61 ± 4.67			7.61 ± 4.67		<0.001
一般	11.09 ± 5.02*	573.27	<0.001	11.09 ± 5.02*	335.01	
较差	13.34 ± 5.82*			13.34 ± 5.82*		

注：*表示与睡眠时间 < 7 h 组进行比较， $P < 0.05$ ；模型 2：调整性别、年龄、教育水平、婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况。

b) 调整性别、年龄、婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况后，睡眠不足(<7 h)和睡眠时间过长(>9 h)的受访者抑郁评分高于睡眠时间正常(7~9 h) (11.09 ± 5.68 、 8.56 ± 5.09 vs 8.42 ± 5.01)的受访者。在对性别组进行分层分析后，结果一致。具体见表 3。

Table 3. Relationship between sleep duration and depression scores in the older population aged 65 years and over
表 3. 65 岁及以上老年人群睡眠时间与抑郁得分的关系

	模型 1			模型 2		
	均数 ± 标准差	F 值	P	均数 ± 标准差	F 值	P
总体						
<7 h	11.09 ± 5.68			11.09 ± 5.68		
7~9 h	8.42 ± 5.01*	284.62	<0.001	8.42 ± 5.01*	142.95	<0.001
>9 h	8.56 ± 5.09*			8.56 ± 5.09*		
男性						
<7 h	10.61 ± 5.78			10.61 ± 5.78		
7~9 h	7.96 ± 4.81*	122.12	<0.001	7.96 ± 4.81*	56.29	<0.001
10~15 h	8.46 ± 4.92*			8.46 ± 4.92*		
女性						
<7 h	11.42 ± 5.60			11.42 ± 5.60		
7~9 h	8.86 ± 5.17*	163.84	<0.001	8.86 ± 5.17*	85.06	<0.001
10~15 h	8.66 ± 5.22*			8.66 ± 5.22*		

注：*表示与睡眠时间 < 7 h 组进行比较， $P < 0.05$ ；模型 1：调整性别和年龄；模型 2：调整性别、年龄、教育水平、婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况。

3) 睡眠情况与抑郁症状的关联分析

a) 本研究中 15.34% 的受访者报告睡眠质量较差, 调整潜在的混杂因素后, 与睡眠质量较好的受访者相比, 睡眠质量一般 ($OR = 3.26, 95\% CI: 2.96\sim 3.59$) 和睡眠质量较差 ($OR = 4.42, 95\% CI: 3.86\sim 5.07$) 均与抑郁症状发生风险增加有关。在对性别进行分层分析后的结果一致。具体见表 4。

Table 4. Relationship between sleep quality and depressive symptoms in the elderly population aged 65 years and over
表 4. 65 岁及以上老年人群睡眠质量与抑郁症状的关系

	抑郁(%)	P	模型 1		模型 2	
			OR (95% CI)	P	OR (95% CI)	P
总体						
较好	30.3		参照组		参照组	
一般	61.3	<0.001	3.65 (3.33, 4.00)	<0.001	3.26 (2.96, 3.59)	<0.001
较差	73.5		6.42 (5.67, 7.29)	<0.001	4.42 (3.85, 5.07)	<0.001
男性						
较好	27.8		参照组		参照组	
一般	61.5	<0.001	4.14 (3.61, 4.75)	<0.001	3.77 (3.26, 4.35)	<0.001
较差	72.6		6.92 (5.64, 8.53)	<0.001	4.90 (3.92, 6.15)	<0.001
女性						
较好	32.8		参照组		参照组	
一般	61.2	<0.001	3.24 (2.87, 3.66)	<0.001	2.88 (2.54, 3.28)	<0.001
较差	74.0		5.85 (4.98, 6.87)	<0.001	4.05 (3.41, 4.82)	<0.001

模型 1: 调整性别和年龄; 模型 2: 调整性别、年龄、教育水平、婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况。

b) 本研究中受访者的平均睡眠时间为 7.33 h, 37.30% 的受访者存在睡眠不足的问题, 18.13% 存在睡眠时间过长的问题。与睡眠时间正常(7~9 h)的受访者相比, 睡眠不足(<7 h) ($OR = 1.82, 95\% CI: 1.66\sim 2.00$) 与抑郁症状发生风险增加有关, 而睡眠时间过长(>9 h) ($OR = 0.88, 95\% CI: 0.78\sim 0.99$) 则与抑郁症状的发生无关。在对性别进行分层分析后的结果一致。具体见表 5。

Table 5. Relationship between sleep duration and depressive symptoms in the elderly population aged 65 years and over
表 5. 65 岁及以上老年人群睡眠时间与抑郁症状的关系

	抑郁(%)	P	模型 1		模型 2	
			OR (95% CI)	P	OR (95% CI)	P
总体						
7~9 h	59.8		参照组		参照组	
<7 h	39.4	<0.001	2.27 (2.08, 2.48)	<0.001	1.82 (1.66, 2.00)	<0.001
>9 h	39.8		0.96 (0.86, 1.08)	0.509	0.88 (0.78, 0.99)	0.034

续表

男性						
7~9 h	56.6		参照组		参照组	
<7 h	36.0	<0.001	2.27 (1.99, 2.59)	<0.001	1.81 (1.56, 2.08)	<0.001
>9 h	37.9		1.01 (0.85, 1.19)	0.944	0.87 (0.73, 1.04)	0.124
女性						
7~9 h	61.9		参照组		参照组	
<7 h	42.5	<0.001	2.20 (1.96, 2.47)	<0.001	1.82 (1.60, 2.06)	<0.001
>9 h	41.3		0.93 (0.80, 1.08)	0.351	0.89 (0.75, 1.05)	0.154

模型 1: 调整性别和年龄; 模型 2: 调整性别、年龄、教育水平、婚姻状况、家庭年收入、自评健康、吸烟情况、饮酒情况、锻炼情况。

4) 睡眠时间与抑郁症状之间的中介分析

a) 中介模型的回归结果显示: 在睡眠质量作为自变量的中介模型 1 中, 睡眠质量($\beta = 1.139, P < 0.001$)与自评健康呈正相关, 睡眠质量($\beta = -2.572, P < 0.001$)和自评健康($\beta = -2.650, P < 0.001$)均与抑郁症状呈负相关; 在睡眠时间作为自变量的中介模型 2 中, 睡眠时间($\beta = 0.446, P < 0.001$)与自评健康呈正相关, 睡眠时间($\beta = -0.998, P < 0.001$)和自评健康($\beta = -3.061, P < 0.001$)均与抑郁症状呈负相关。具体见表 6。

Table 6. Regression results of the intermediary model
表 6. 中介模型的回归结果

	自评健康		抑郁症状	
	β	SE	β	SE
睡眠质量	1.139***	0.068	-2.572***	0.132
自评健康			-2.650***	0.136
R ²		0.280		
调整 R ²		0.279		
N		10319		
睡眠时间	0.446***	0.062	-0.998***	0.095
自评健康			-3.061***	0.136
R ²		0.258		
调整 R ²		0.257		
N		10319		

注: *** 代表通路在 $P < 0.001$ 时显著。β: 非标准化系数; SE: 标准误差。

b) 根据中介模型分析, 自评健康调节了睡眠情况与抑郁之间的关联, 如图 1、图 2 所示。在睡眠质量作为自变量的中介模型 1 中, 睡眠质量与抑郁症状之间约 13.16% (间接效应/总效应) 的显著关联是由自评健康介导的。睡眠时间作为自变量的中介模型 2 中, 睡眠时间与抑郁症状之间约 12.12% (间接效应/总

效应)的显著关联是由自评健康介导的。具体见表 7。

Table 7. Indirect effects between sleep quality, sleep duration and depressive symptoms through self-assessed health
表 7. 睡眠质量、睡眠时间与抑郁症状之间通过自评健康的间接影响

	路径	影响	SE	Boot (95% CI)
模型 1: 睡眠质量	间接效应 a1b1	-0.417	0.043	(-0.519, -0.351)
	直接效应 c1	-2.752	0.144	(-3.035, -2.477)
	总效应	-3.169	0.142	(-3.475, -2.900)
模型 2: 睡眠时间	间接效应 a2b2	-0.139	0.026	(-0.205, -0.103)
	直接效应 c2	-0.998	0.094	(-1.172, -0.881)
	总效应	-1.147	0.097	(-1.341, -0.961)

注: 偏差校正自举置信区间的自举样本数: 1000。CI: 置信区间; SE: 标准误差。a1b1: 睡眠质量通过自评健康间接影响抑郁; c1: 睡眠质量直接影响抑郁; a1b1: 睡眠时间通过自评健康间接影响抑郁; c1: 睡眠时间直接影响抑郁。

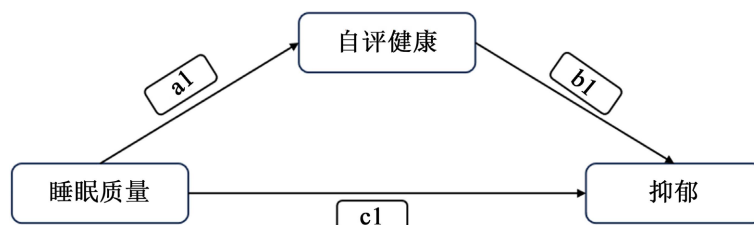


Figure 1. Path diagram of the mediating effect of self-assessed health on the association between sleep quality and depressive symptoms

图 1. 自评健康在睡眠质量与抑郁症状之间的中介效应路径图

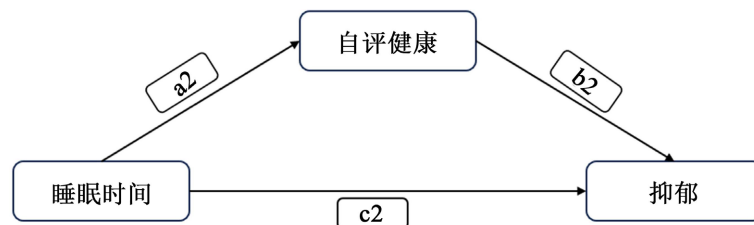


Figure 2. Path diagram of the mediating effect of self-assessed health on the association between sleep duration and depressive symptoms

图 2. 自评健康在睡眠时间与抑郁症状之间的中介效应路径图

4. 讨论

本研究发现, 睡眠时间和睡眠质量均会显著影响老年人的抑郁症状, 自评健康在睡眠时间与抑郁症状以及睡眠质量与抑郁症状之间起到了中介作用。具体来说, 睡眠质量不佳(一般/较差)以及睡眠时间不足 7 h 的老年人更有可能感到不健康, 这增加了患晚年抑郁症的风险, 但通过改善睡眠情况及提升自评健康水平可以降低抑郁症的发生风险。

本研究结果显示睡眠质量不佳和睡眠时间不足均与老年人抑郁症状的发生有关, 这与国内外多项研究结果一致[22]-[29]。一项横断面研究发现, 睡眠时间短(<7 小时/天)的老年人更容易患抑郁症[28], Becker 等[29]通过对 9 篇文献进行 Meta 分析的结果显示老年人缺乏良好的睡眠与抑郁症显著相关, 并会对健康

有负面影响。一项基于社区老年人的纵向研究分析发现,睡眠时间短是抑郁症发作和复发的危险因素[30]。睡眠不足的人可能有更多时间进行悲观思考[31],一项纳入 154 项研究的系统综述总结道,所有形式的睡眠不足都会导致悲观情绪增加(标准化平均差 = -0.27~-1.14) [32]; 另一方面,睡眠不足可能会导致杏仁核对负面刺激做出过度反应,当睡眠不足的参与者看到情绪消极的图像时,杏仁核的活动水平要比那些睡眠好的人高出 60% [33]。因此,睡眠不足可能间接地增加了抑郁症的风险和不良后果。本研究并未发现睡眠时间过长与抑郁症的关联,这与过去的大部分研究一致[30] [34] [35] [36],但也有少量研究表明,睡眠时间与抑郁症状之间存在“U”型关联,即睡眠时间不足或睡眠时间过长均会使得抑郁症状的发生风险增加[37] [38] [39]。关于睡眠时间过长与抑郁之间的关系,还需要进一步的探讨。

虽然上述研究表明睡眠情况与抑郁症状之间的直接关联,但睡眠与抑郁症状之间关系的潜在机制尚不完全清楚,目前主要有以下几种猜想。① 炎症假说:睡眠不足可能通过激活交感神经系统和 β -肾上腺素能信号传导来增加炎症标志物(例如 IL-6 和 CRP),从而增加 NF- κ B 并激活炎症基因表达[40],这些炎症因子与抑郁症的发生高度相关[41]。② 生化途径:重度抑郁症与快速眼动睡眠的破坏有关,其与单胺和胆碱能神经元相互作用引起快速眼动睡眠异常[42] [43],进而影响抑郁症状,但两者之间的因果关系尚不清楚[44] [45]。③ 遗传相关性:影响失眠的基因也影响抑郁症[46] [47],一项针对儿童的研究发现,睡眠和抑郁之间的遗传相关性为 0.64 [48]; 另一项后续设计良好的研究得出结论,睡眠的潜在额外遗传影响与重度抑郁症重叠显著(女性为 56%,男性为 74%) [49]。④ 昼夜节律:生物钟节律的紊乱与重度抑郁症患者相关[50],其生成和调节中的关键基因与抑郁症的发展密切相关,而时钟基因的失调可能是导致失眠和抑郁症的重要因素之一[51] [52],但尚未完全理解其调节机制。本研究创新性的探讨了睡眠时间和睡眠质量与抑郁症状之间的间接关联。据我们所知,这是第一项探索自评健康在睡眠与抑郁症状之间的中介作用的研究。考虑到老龄化问题的不断加剧,探讨睡眠是否通过其他途径影响抑郁具有重要意义,从而实现多路径干预预防抑郁症状的发生。

自评健康已成为一种越来越普遍的衡量健康主观感知的工具[53]。先前的研究表明,自评健康可以很好地预测客观健康状况[54],并且与健康结果相关[55]。较差的睡眠情况会损害情绪和认知功能[56],增加白天的疲劳[57],并与许多负面的健康状况有关。有研究发现,“短”和“长”睡眠以及睡眠质量“差”都与自评健康“差”相关[58]。同时,自评健康与抑郁症状呈负相关,Fernandez 等[59]发现,无论男女,自我感觉健康状况良好的受试者患抑郁症的可能性较小。上述研究结果进一步佐证本研究:睡眠情况好的老年人感到自评健康较差的可能性比较小,这抑制了晚年抑郁的发生和发展;相反,睡眠情况差的老年人可能会自觉不健康,睡眠之外的大量时间用来悲观思考,最终导致抑郁症。

在目前的研究中,我们发现自评健康解释了睡眠情况和抑郁症状之间的部分联系。尽管不能从这项研究中直接得出因果推论,但自评健康在睡眠情况和抑郁症状之间的作用值得关注和进一步研究。对睡眠情况、自评健康水平进行干预,关注睡眠健康,提高自我认知的健康水平,均可以延缓晚年抑郁的发生发展。但是本研究仍存在一些不足,首先,本研究所有的变量都是通过主观评估获得的,存在一定的误差;其次,本研究是一项横断面研究,我们无法获取各变量之间因果联系的时间顺序,未来可以通过纵向研究获取更丰富的关于中介变量的信息,通过交叉滞后中介模型分析中介因果关系。

5. 结论

睡眠时间不足和睡眠质量不佳是引起老年人抑郁风险增加的危险因素,社会应密切关注睡眠时间不足和睡眠质量不理想的老年人,及早筛查抑郁的发生风险。我们的研究进一步证实,自评健康是睡眠情况和抑郁症状之间的中介变量。因此,保证充足而良好的睡眠、提高自评健康水平,有望缓解老年人的抑郁症状。

参考文献

- [1] Beevers, C.G. (2005) Cognitive Vulnerability to Depression: A Dual Process Model. *Clinical Psychology Review*, **25**, 975-1002. <https://doi.org/10.1016/j.cpr.2005.03.003>
- [2] Mallinson, S. and Popay, J. (2007) Describing Depression: Ethnicity and the Use of Somatic Imagery in Accounts of Mental Distress. *Sociology of Health & Illness*, **29**, 857-871. <https://doi.org/10.1111/j.1467-9566.2007.01048.x>
- [3] Fick, S.F. and Zeiss, A.M. (2001) Scientific Foundations of Cognitive Theory and Therapy of Depression. *Clinical Psychology Review*, **21**, 818-820. [https://doi.org/10.1016/S0272-7358\(00\)00063-5](https://doi.org/10.1016/S0272-7358(00)00063-5)
- [4] Zhang, Y., Liu, Z., Zhang, L., et al. (2019) Association of Living Arrangements with Depressive Symptoms among Older Adults in China: A Cross-Sectional Study. *BMC Public Health*, **19**, Article No. 1017. <https://doi.org/10.1186/s12889-019-7350-8>
- [5] Copeland, J. (2002) The Geographical Distribution of Depression among Older People in Europe. *Journal of Clinical Psychiatry*, **63**, 1060.
- [6] Tang, T., Jiang, J. and Tang, X. (2021) Prevalence of Depressive Symptoms among Older Adults in Mainland China: A Systematic Review and Meta-Analysis. *Journal of Affective Disorders*, **293**, 379-390. <https://doi.org/10.1016/j.jad.2021.06.050>
- [7] Heslon, C. (2016) [Suicide, a Philosophical Act or an Act of Depression?] *Soins Gerontologie*, **21**, 12-14. <https://doi.org/10.1016/j.sger.2016.03.002>
- [8] He, Y. (2020) Conducting Systematic Researches on Influencing Factors for Healthy Ageing and Promoting Scientific Implementation of Health Promotion Program for the Elderly. *Chinese Journal of Epidemiology*, **41**, 9-12.
- [9] Van Den Berg, J.F., Luijckendijk, H.J., Tulen, J.H.M., et al. (2009) Sleep in Depression and Anxiety Disorders: A Population-Based Study of Elderly Persons. *Journal of Clinical Psychiatry*, **70**, 1105-1113. <https://doi.org/10.4088/JCP.08m04448>
- [10] Roberts, R.E., Shema, S.J., Kaplan, G.A., et al. (2000) Sleep Complaints and Depression in an Aging Cohort: A Prospective Perspective. *American Journal of Psychiatry*, **157**, 81-88. <https://doi.org/10.1176/ajp.157.1.81>
- [11] Van Mill, J.G., Vogelzangs, N., Van Someren, E.J., et al. (2014) Sleep Duration, but Not Insomnia, Predicts the 2-Year Course of Depressive and Anxiety Disorders. *Journal of Clinical Psychiatry*, **75**, 119-126. <https://doi.org/10.4088/JCP.12m08047>
- [12] Jackowska, M. and Poole, L. (2017) Sleep Problems, Short Sleep and a Combination of Both Increase the Risk of Depressive Symptoms in Older People: A 6-Year Follow-Up Investigation from the English Longitudinal Study of Ageing. *Sleep Medicine*, **37**, 60-65. <https://doi.org/10.1016/j.sleep.2017.02.004>
- [13] Jaussent, I., Bouyer, J., Ancelin, M.-L., et al. (2011) Insomnia and Daytime Sleepiness Are Risk Factors for Depressive Symptoms in the Elderly. *Sleep*, **34**, 1103-1110. <https://doi.org/10.5665/SLEEP.1170>
- [14] Lopresti, A.L., Hood, S.D. and Drummond, P.D. (2013) A Review of Lifestyle Factors that Contribute to Important Pathways Associated with Major Depression: Diet, Sleep and Exercise. *Journal of Affective Disorders*, **148**, 12-27. <https://doi.org/10.1016/j.jad.2013.01.014>
- [15] Buysse, D.J., Reynolds, C.F., Monk, T.H., et al. (1989) The Pittsburgh Sleep Quality Index—A New Instrument for Psychiatric Practice and Research. *Psychiatry Research*, **28**, 193-213. [https://doi.org/10.1016/0165-1781\(89\)90047-4](https://doi.org/10.1016/0165-1781(89)90047-4)
- [16] Gu, D., Sautter, J., Pipkin, R., et al. (2010) Sociodemographic and Health Correlates of Sleep Quality and Duration among Very Old Chinese. *Sleep*, **33**, 601-610. <https://doi.org/10.1093/sleep/33.5.601>
- [17] Qiu, L., Sautter, J., Liu, Y., et al. (2011) Age and Gender Differences in Linkages of Sleep with Subsequent Mortality and Health among Very Old Chinese. *Sleep Medicine*, **12**, 1008-1017. <https://doi.org/10.1016/j.sleep.2011.04.014>
- [18] Cheng, S.-T. and Chan, A.C.M. (2008) Detecting Depression in Chinese Adults with Mild Dementia: Findings with Two Versions of the Center for Epidemiologic Studies Depression Scale. *Psychiatry Research*, **159**, 44-49. <https://doi.org/10.1016/j.psychres.2007.06.023>
- [19] James, C., Powell, M., Seixas, A., et al. (2020) Exploring the Psychometric Properties of the CES-D-10 and Its Practicality in Detecting Depressive Symptomatology in 27 Low- and Middle-Income Countries. *International Journal of Psychology*, **55**, 435-445. <https://doi.org/10.1002/ijop.12613>
- [20] Cheng, H.G., Chen, S., McBride, O., et al. (2016) Prospective Relationship of Depressive Symptoms, Drinking, and Tobacco Smoking among Middle-Aged and Elderly Community-Dwelling Adults: Results from the China Health and Retirement Longitudinal Study (CHARLS). *Journal of Affective Disorders*, **195**, 136-143. <https://doi.org/10.1016/j.jad.2016.02.023>
- [21] Chen, F., Yang, Y. and Liu, G. (2010) Socioeconomic Disparities in Health Over the Life Course in China: A Cohort Analysis. *American Sociological Review*, **75**, 126-150. <https://doi.org/10.1177/0003122409359165>

- [22] Hu, Z., Zhu, X.D., Kaminga, A.C., *et al.* (2020) Association between Poor Sleep Quality and Depression Symptoms among the Elderly in Nursing Homes in Hunan Province, China: A Cross-Sectional Study. *BMJ Open*, **10**, e036401. <https://doi.org/10.1136/bmjopen-2019-036401>
- [23] Orhan, F.O., Tuncel, D., Tas, F., *et al.* (2012) Relationship between Sleep Quality and Depression among Elderly Nursing Home Residents in Turkey. *Sleep and Breathing*, **16**, 1059-1067. <https://doi.org/10.1007/s11325-011-0601-2>
- [24] Zhong, W., Wang, F., Chi, L., *et al.* (2022) Association between Sleep Duration and Depression among the Elderly Population in China. *Experimental Aging Research*, **48**, 387-399. <https://doi.org/10.1080/0361073X.2021.2008755>
- [25] Chen, C., Li, J., Zhang, J., *et al.* (2020) The Influencing Factors of Sleep Time and Its Relationship with Cognition and Depression in Middle-aged and Elderly People. *Chinese Journal of Disease Control & Prevention*, **24**, 919-922.
- [26] Sukegawa, T., Itoga, M., Seno, H., *et al.* (2003) Sleep Disturbances and Depression in the Elderly in Japan. *Psychiatry and Clinical Neurosciences*, **57**, 265-270. <https://doi.org/10.1046/j.1440-1819.2003.01115.x>
- [27] Zhang, J., Zhang, Y., Luan, Z., *et al.* (2020) A Study on Depression of the Elderly with Different Sleep Quality in Pension Institutions in Northeastern China. *BMC Geriatrics*, **20**, Article No. 374. <https://doi.org/10.1186/s12877-020-01777-4>
- [28] Luo, Y., Li, Y., Xie, J., *et al.* (2022) Symptoms of Depression Are Related to Sedentary Behavior and Sleep Duration in Elderly Individuals: A Cross-Sectional Study of 49,317 Older Chinese Adults. *Journal of Affective Disorders*, **308**, 407-412. <https://doi.org/10.1016/j.jad.2022.04.102>
- [29] Becker, N.B., Jesus, S.N., Joao, K.A.D.R., *et al.* (2017) Depression and Sleep Quality in Older Adults: A Meta-Analysis. *Psychology Health & Medicine*, **22**, 889-895. <https://doi.org/10.1080/13548506.2016.1274042>
- [30] Sun, Y., Shi, L., Bao, Y., *et al.* (2018) The Bidirectional Relationship between Sleep Duration and Depression in Community-Dwelling Middle-Aged and Elderly Individuals: Evidence from a Longitudinal Study. *Sleep Medicine*, **52**, 221-229. <https://doi.org/10.1016/j.sleep.2018.03.011>
- [31] Van Noorden, M.S., Van Fenema, E.M., Van Der Wee, N.J.A., *et al.* (2012) Predicting Outcome of Depression Using the Depressive Symptom Profile: The Leiden Routine Outcome Monitoring Study. *Depression and Anxiety*, **29**, 523-530. <https://doi.org/10.1002/da.21958>
- [32] Palmer, C.A., Bower, J.L., Cho, K.W., *et al.* (2023) Sleep Loss and Emotion: A Systematic Review and Meta-Analysis of over 50 Years of Experimental Research. *Psychological Bulletin*. <https://doi.org/10.1037/bul0000410>
- [33] Sterpenich, V., Albouy, G., Boly, M., *et al.* (2007) Sleep-Related Hippocampo-Cortical Interplay during Emotional Memory Recollection. *PLOS BIOLOGY*, **5**, 2709-2722. <https://doi.org/10.1371/journal.pbio.0050282>
- [34] Zhai, L., Zhang, H. and Zhang, D. (2015) Sleep Duration and Depression among Adults: A Meta-Analysis of Prospective Studies. *Depression and Anxiety*, **32**, 664-670. <https://doi.org/10.1002/da.22386>
- [35] Gehrman, P., Seelig, A.D., Jacobson, I.G., *et al.* (2013) Predeployment Sleep Duration and Insomnia Symptoms as Risk Factors for New-Onset Mental Health Disorders Following Military Deployment. *Sleep*, **36**, 1009-1018. <https://doi.org/10.5665/sleep.2798>
- [36] Paudel, M., Taylor, B.C., Ancoli-Israel, S., *et al.* (2013) Sleep Disturbances and Risk of Depression in Older Men. *Sleep*, **36**, 1033-1040. <https://doi.org/10.5665/sleep.2804>
- [37] Geoffroy, P.A., Tebeka, S., Blanco, C., *et al.* (2020) Shorter and Longer Durations of Sleep Are Associated with an Increased Twelve-Month Prevalence of Psychiatric and Substance Use Disorders: Findings from a Nationally Representative Survey of US Adults (NESARC-III). *Journal of Psychiatric Research*, **124**, 34-41. <https://doi.org/10.1016/j.jpsychires.2020.02.018>
- [38] Zhang, X.F., Liu, F., Liu, W.P., *et al.* (2021) Relationship between Sleep Duration and Depressive Symptoms in Middle-Aged and Elderly People in Four Provinces of China. *Chinese Journal of Epidemiology*, **42**, 1955-1961.
- [39] Tsou, M.-T. (2011) Association between Sleep Duration and Health Outcome in Elderly Taiwanese. *International Journal of Gerontology*, **5**, 200-205. <https://doi.org/10.1016/j.ijge.2011.09.020>
- [40] Irwin, M.R. and Cole, S.W. (2011) Reciprocal Regulation of the Neural and Innate Immune Systems. *Nature Reviews Immunology*, **11**, 625-632. <https://doi.org/10.1038/nri3042>
- [41] Gimeno, D., Kivimaki, M., Brunner, E.J., *et al.* (2009) Associations of C-Reactive Protein and Interleukin-6 with Cognitive Symptoms of Depression: 12-Year Follow-Up of the Whitehall II Study. *Psychological Medicine*, **39**, 413-423. <https://doi.org/10.1017/S0033291708003723>
- [42] Adrien, J. (2002) Neurobiological Bases for the Relation between Sleep and Depression. *Sleep Medicine Reviews*, **6**, 341-351. <https://doi.org/10.1053/smr.2001.0200>
- [43] Wang, Y.-Q., Li, R., Zhang, M.-Q., *et al.* (2015) The Neurobiological Mechanisms and Treatments of REM Sleep Disturbances in Depression. *Current Neuropharmacology*, **13**, 543-553. <https://doi.org/10.2174/1570159X13666150310002540>

- [44] Krishnan, V. and Nestler, E.J. (2008) The Molecular Neurobiology of Depression. *Nature*, **455**, 894-902. <https://doi.org/10.1038/nature07455>
- [45] Wang, Y.-Q., Tu, Z.-C., Xu, X.-Y., et al. (2012) Acute Administration of Fluoxetine Normalizes Rapid Eye Movement Sleep Abnormality, but Not Depressive Behaviors in Olfactory Bulbectomized Rats. *Journal of Neurochemistry*, **120**, 314-324. <https://doi.org/10.1111/j.1471-4159.2011.07558.x>
- [46] Gehrman, P.R., Meltzer, L.J., Moore, M., et al. (2011) Heritability of Insomnia Symptoms in Youth and Their Relationship to Depression and Anxiety. *Sleep*, **34**, 1641-1646. <https://doi.org/10.5665/sleep.1424>
- [47] Stein, M.B., Mccarthy, M.J., Chen, C.-Y., et al. (2018) Genome-Wide Analysis of Insomnia Disorder. *Molecular Psychiatry*, **23**, 2238-2250. <https://doi.org/10.1038/s41380-018-0033-5>
- [48] Gregory, A.M., Rijdsdijk, F.V., Dahl, R.E., et al. (2006) Associations between Sleep Problems, Anxiety, and Depression in Twins at 8 Years of Age. *Pediatrics*, **118**, 1124-1132. <https://doi.org/10.1542/peds.2005-3118>
- [49] Lind, M.J., Hawn, S.E., Sheerin, C.M., et al. (2017) An Examination of the Etiologic Overlap between the Genetic and Environmental Influences on Insomnia and Common Psychopathology. *Depression and Anxiety*, **34**, 453-462. <https://doi.org/10.1002/da.22587>
- [50] Li, J.Z., Bunney, B.G., Meng, F., et al. (2013) Circadian Patterns of Gene Expression in the Human Brain and Disruption in Major Depressive Disorder. *Proceedings of the National Academy of Sciences*, **110**, 9950-9955. <https://doi.org/10.1073/pnas.1305814110>
- [51] Lamont, E.W., Legault-Coutu, D., Cermakian, N., et al. (2007) The Role of Circadian Clock Genes in Mental Disorders. *Dialogues in Clinical Neuroscience*, **9**, 333-342. <https://doi.org/10.31887/DCNS.2007.9.3/elamont>
- [52] Monteleone, P., Martiadis, V. and Maj, M. (2011) Circadian Rhythms and Treatment Implications in Depression. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, **35**, 1569-1574. <https://doi.org/10.1016/j.pnpbp.2010.07.028>
- [53] Frange, C., De Queiroz, S.S., Da Silva Prado, J.M., et al. (2014) The Impact of Sleep Duration on Self-Rated Health. *Sleep Science*, **7**, 107-113. <https://doi.org/10.1016/j.slsci.2014.09.006>
- [54] Wu, S., Wang, R., Zhao, Y., et al. (2013) The Relationship between Self-Rated Health and Objective Health Status: A Population-Based Study. *BMC Public Health*, **13**, Article No. 320. <https://doi.org/10.1186/1471-2458-13-320>
- [55] Miilunpalo, S., Vuori, I., Oja, P., et al. (1997) Self-Rated Health Status as a Health Measure: The Predictive Value of Self-Reported Health Status on the Use of Physician Services and on Mortality in the Working-Age Population. *Journal of Clinical Epidemiology*, **50**, 517-528. [https://doi.org/10.1016/S0895-4356\(97\)00045-0](https://doi.org/10.1016/S0895-4356(97)00045-0)
- [56] Faubel, R., Lopez-Garcia, E., Guallar-Castillon, P., et al. (2009) Usual Sleep Duration and Cognitive Function in Older Adults in Spain. *Journal of Sleep Research*, **18**, 427-435. <https://doi.org/10.1111/j.1365-2869.2009.00759.x>
- [57] Goldman, S.E., Ancoli-Israel, S., Boudreau, R., et al. (2008) Sleep Problems and Associated Daytime Fatigue in Community-Dwelling Older Individuals. *Journals of Gerontology Series A—Biological Sciences and Medical Sciences*, **63**, 1069-1075. <https://doi.org/10.1093/gerona/63.10.1069>
- [58] Stefan, L., Vucetic, V., Vrgoc, G., et al. (2018) Sleep Duration and Sleep Quality as Predictors of Health in Elderly Individuals. *Sustainability*, **10**, Article 3918. <https://doi.org/10.3390/su10113918>
- [59] Fernandez, B.R., Rosero-Bixby, L. and Koivumaa-Honkanen, H. (2016) Effects of Self-Rated Health and Self-Rated Economic Situation on Depressed Mood via Life Satisfaction among Older Adults in Costa Rica. *Journal of Aging and Health*, **28**, 225-243. <https://doi.org/10.1177/0898264315589577>