


Mind-Body Practice and Family Caregivers' Subjective Well-Being: Findings From the Midlife in the United States (MIDUS) Study

Gerontology & Geriatric Medicine
Volume 9: 1–9
© The Author(s) 2023
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/23337214231185912
journals.sagepub.com/home/ggm



Kallol Kumar Bhattacharyya, MBBS, MA, PhD¹ ,
Yin Liu, PhD¹, Neha P. Gothe, PhD^{2,3},
and Elizabeth B. Fauth, PhD¹

Abstract

Objectives: Informal caregiving has been associated with higher stress and lower levels of subjective well-being. Mind-body practices including yoga, tai chi, and Pilates also incorporate stress reducing activities. The current study aimed to examine the association between mind-body practice and subjective well-being among informal family caregivers. **Methods:** A sample of informal caregivers were identified in the Midlife in the United States study ($N=506$, $M \pm SD_{age} = 56 \pm 11$, 67% women). We coded mind-body practice into three categories, including regular practice (participating in one or more of them “a lot” or “often”), irregular (participating “sometimes” and “rarely”) and no practice (“never”). Subjective well-being was measured using the 5-item global life satisfaction scale and the 9-item mindfulness scale. We used multiple linear regression models to examine associations between mind-body practice and caregivers' subjective well-being, controlling for covariates of sociodemographic factors, health, functional status, and caregiving characteristics. **Results:** Regular practice was associated with both better mindfulness-related well-being ($b=2.26$, $p < .05$) and better life satisfaction ($b=0.43$, $p < .05$), after controlling for covariates. **Discussion:** Future research should examine whether there is a selection effect of caregivers with higher well-being being more likely to choose these activities, and/or if mind-body practices are effective non-pharmacological interventions to improve family caregivers' quality of life.

Keywords

MIDUS, mind-body practice, informal caregiver, well-being, quality of life

Manuscript received: March 28, 2023; **final revision received:** May 16, 2023; **accepted:** June 15, 2023.

Introduction

With the advancements in medical management, more people live longer with chronic illnesses and disabilities. For most community-living older adults, families often are the primary source of care and support, contributing services that would cost enormous monetary expenses annually if they had to be purchased (Hazzan et al., 2022; Langa et al., 2001). Caregivers are considered essential national healthcare resources (Cheng et al., 2020; Schulz & Sherwood, 2008), and their quality of life is related to the quality of care and quality of life of the care recipients (Shani et al., 2021).

Being an informal caregiver, however, can be stressful (Cheng et al., 2020; Collins & Kishita, 2019; Schmaderer et al., 2020; Schulz & Sherwood, 2008). The stress process model (Pearlin et al., 1990) provides an appropriate theoretical approach to incorporate the

role of multidimensional social factors (e.g., age, sex, socioeconomic status) as well as caregiving characteristics to health outcomes among caregivers (Judge et al., 2010), along with the physical and psychological strain on the caregivers over time, care-related burden can produce secondary stress in other aspects of life, such as work and family relationships (Schulz & Sherwood, 2008). Further, caregiving can negatively impact the quality of life of the caregivers, resulting in poor sleep,

¹Utah State University, Logan, USA

²University of Illinois, Urbana Champaign, USA

³Northeastern University, Boston, MA, USA

Corresponding Author:

Kallol Kumar Bhattacharyya, Alzheimer's Disease and Dementia Research Center, Utah State University, 2800 Old Main Hill, Logan, UT 84322, USA.

Email: kallolkumar.bhattacharyya@usu.edu



fatigue, isolation, and depression (Pinquart & Sörensen, 2007; Shani et al., 2021). In sum, chronic stress from caregiving can lead to poorer physical, psychological, social, and spiritual well-being (Cohen et al., 2021; Shani et al., 2021), as well as poorer life satisfaction (Karataş et al., 2021).

Life satisfaction is defined as the cognitive and affective evaluations of one's own life (Diener et al., 2002). Life satisfaction can be achieved through social support and relationship with others (Matud et al., 2014), through happiness, hope, and meaning in life (Karataş et al., 2021; Nasiri & Bahram, 2008), as well as through psychological and physical health practices (Karataş et al., 2021). In this context, promoting caregiver well-being could potentially improve their overall quality of life, including their physical and mental health status.

Mindfulness is a conscious perception of the present moment without judgment and biases; social mindfulness needs cooperation with being thoughtful to others (Van Doesum et al., 2021). The subjective "perception" of mindfulness is a complex process and involves an enhanced state of engagement with the environment and being meaningful in the present (Langer & Moldoveanu, 2000). Research has identified mindfulness as an adaptive coping strategy, and mindful individuals achieve a higher state of well-being, possibly due to judging situations in non-threatening ways (Sesker et al., 2016). With its relation to potential solutions to many social problems, mindfulness can provide better well-being (Hepburn et al., 2021; Rosini et al., 2017).

Mind-body practices generally consist of both physical movement and meditative components of varying nature (Bhattacharyya et al., 2021). The most commonly used mind-body practice is yoga, which is an ancient Indian technique of mind-body interrelated practice that includes physical movement (asanas), breathing exercises (pranayama), and meditation (dhyana) (Cramer et al., 2019; Hariprasad et al., 2013; Uebelacker et al., 2017). Tai chi is a form of Chinese martial art originally practiced for defense training; however, this also has some meditative health benefits (Abbott & Lavretsky, 2013; Jahnke et al., 2010; Tsang et al., 2019). Pilates is another widely used method of movement therapy that consists of low-impact training on flexibility, muscular strength, and endurance (Fleming & Herring, 2018; Kloubec, 2011; Lim & Park, 2019). Recently, mind-body practices have gained popularity in the United States; for example, the age-adjusted rate of yoga practice increased from 9.5 to 14.3% between 2012 and 2017 (4.1–14.2% for meditation) (Clarke et al., 2018; Wang et al., 2019). Previous research demonstrated that mind-body practices could be potentially used as a safe, acceptable, and cost-effective intervention to improve various comorbidities, including chronic diseases and cognitive decline (Rocha et al., 2012).

Mind-body practices have been found to be associated with increased physical activity, reduced stress, and increased well-being (Maric et al., 2021; Rocha et al.,

2012). Negative effects of stress on cognitive function are well-documented (Marin et al., 2011; Scott et al., 2015). During stress, an individual's sympathetic nervous system is triggered; as a result, various inflammatory neurotransmitters like cytokines are released, which may have adverse effects on (cognitive) health. Mind-body practices have a down regulatory effect on the sympathetic nervous system and hypothalamus-pituitary-adrenal axis in response to stress (Bhattacharyya et al., 2022; Hariprasad et al., 2013; Ross & Thomas, 2010). Bridging the mind and body, mind-body practices through various neuronal circuits may reduce the production of inflammatory neurotransmitters (Ross & Thomas, 2010; Ulrich-Lai & Herman, 2009). Individuals may turn to mind-body practice (e.g., yoga) for these stress-reducing effects. As a physical activity, the practice of yoga can enhance muscle strength and body flexibility and improve respiratory and cardiovascular function (Woodyard, 2011).

The Current Study

The current study examined how mind-body practices, including yoga, tai chi, and Pilates, are associated with subjective well-being in middle-aged and older adult informal caregivers who self-reported informal caregiving in the past 12 months. In the current study, subjective well-being was assessed using both a mindfulness-specific component of wellbeing, and a more global measure of life satisfaction. We sampled from a nationally representative sample of middle-aged and older adults in the United States, and considered sociodemographic and health factors and caregiving characteristics that are commonly correlated with subjective well-being as covariates, including caregiving hours, relationship types, co-residence, experienced or new caregivers, and whether the care was still ongoing. We hypothesized that more frequent engagement in mind-body practices would be associated with greater mindfulness-wellbeing and life satisfaction among informal family caregivers.

Method

The Sample

The current study used data from the second wave of the national survey of Midlife in the United States (MIDUS). The MIDUS 2 study was conducted between 2004 and 2005, with 4,963 participants (Hughes et al., 2018). In MIDUS 2, participants' age ranged from 35 to 86 years ($M=55$, $SD=11$), with women making up 53% of the sample (Ryff et al., 2012). We identified 506 family caregivers who had given personal care to a family member or friend in the last 12 months because of specific conditions, illness, or disability that caused the need for personal care. MIDUS 2 was conducted over the phone, along with a mailed self-administered questionnaire (SAQ).

Measures and Procedure

Key independent variable. The mind-body practice was used as the key independent variable. Participants responded to the question “In the past 12 months, either to treat a physical health problem, to treat an emotional or personal problem, to maintain or enhance your wellness, or to prevent the onset of illness, how often did you use—exercise or movement therapy (yoga, pilates, tai chi, etc.)?” on a 5-point Likert scale ranging from 1 (performing “a lot”) to 5 (“never”). Responses were reverse coded with higher values indicating more frequent mind-body practice (i.e., “a lot”=4, “often”=3, “sometimes”=2, and “rarely”=1); responses indicating no practice (i.e., “never”) were coded as 0. We further combined the responses indicating mind-body practice frequency into three categories as regular practice (2, i.e., “a lot” and “often”), irregular practice (1, i.e., “sometimes” and “rarely”), and never (0, i.e., “never”) based on distribution of the raw variable.

Key dependent variables. Mindfulness-wellbeing was assessed using a 9-item scale in the SAQ. Some sample questions included “Because of your religion or spirituality, do you try to be . . .”: “more engaged in the present moment,” “more sensitive to the feelings of others,” “more receptive to new ideas,” “a better listener,” “a more patient person,” “more aware of small changes in my environment,” “more tolerant of differences,” “more aware of different ways to solve problems,” and “more likely to perceive things in new ways” (Sesker et al., 2016). The responses ranged from 1 (*strongly agree*) to 5 (*strongly disagree*); then, we recoded a composite score based on the sum of the values of the items and was reverse-coded with higher scores reflecting higher standing. Scores were not calculated for cases with fewer than half of the items missing on the scale. We emphasize that this scale focuses on internal perceptions of psychosocial wellbeing, not behavioral practices of mindfulness (which would be captured in the independent variable of mind-body practice).

A second outcome was global life satisfaction, assessed via a 5-item scale in the SAQ, where participants rated their life overall, work, health, relationship with spouse/partner, and relationship with children (Prenda & Lachman, 2001). Responses were coded from 0 (*the worst possible*) to 10 (*the best possible*). The scores for relationship with spouse/partner and relationship with children were averaged to create one score, and was used along with the remaining 3 items to calculate an overall mean score coded with higher scores reflecting better overall life satisfaction. MIDUS computed the scale for cases that have valid values for at least 1 item on the scale; the scale score is not calculated for cases with no valid item for the scales.

Covariates. We considered the following sociodemographic variables, including age (0=<45, 1=45–54,

2=55–64, 3=65–74, 4= \geq 75), gender (0=male, 1=female), race (1=White, 2=Black, 3=other), marital status (1=married, 2=separated/divorced, 3=widowed, 4=never married), education (1=no/some school, 2=high school graduate/in college, 3=graduated from college, 4=having master’s/professional degree), and employment (1=currently working, 2=self-employed, 3=retired, 4=unemployed, 5=other). We considered caregivers’ chronic condition/s in the past 12 months (0=no, 1=yes) and tobacco and alcohol use (1=regular tobacco/alcohol user, or 0=not).

We considered the following variables on caregiving characteristics. These are care recipient relationship type (1=spouses, 2=children, 3=parents, and 4=others), caregiving time (0=<10 hours per week, 1=10–40 hours per week, 2=>40 hours per week), whether one was still providing care (0=no, 1=yes), whether one was co-residing with the care recipient (0=no, 1=yes), whether one provided care before (0=no, 1=yes), and whether one assisted care with activities and instrumental activities of daily living (ADL/IADL; 0=no, 1=yes). For the ADL/IADL assistance, participants were asked to indicate whether they assisted in any of the following care tasks: i) bathing, dressing, eating, or going to the bathroom, ii) getting around inside/outside the house, iii) shopping, cooking, housework, or laundry, and iv) managing money, making phone calls, and taking medications; responses indicating assisted in one or more care tasks were coded as 1 (*no ADL/IADL assistance*=0).

Statistical Analysis

Statistical analyses were conducted in Stata 17.0 SE (College Station, TX) software. To examine the association between mind-body practice frequency and indicators of subjective well-being among informal caregivers, we estimated multiple linear regression models by predicting subjective life satisfaction and mindfulness at wave 2 (dependent variables) in separate models, while controlling for covariates (sociodemographic factors, health, and caregiving characteristics). Statistical significance was evaluated at $p < .05$ (two-sided). Unstandardized regression coefficients (b) and 95% confidence intervals (CI) were reported.

Results

Descriptive statistics of the dependent and independent variables, including demographic variables and health status at wave 2, are shown in Table 1. A total of 506 individuals aged 35 to 84 years ($M=56.5$, $SD=11.3$) were included in the analysis. Women made up 67% of the sample, 46% were employed, and 89% were White. The respondents’ educational levels were high, with 47% having graduated from college/some college and 15% having a master’s or professional degree. Table 1 also shows differences between those who used

Table 1. Comparison of Respondent Characteristics of US Adults in Wave 2 (n = 506).

Variables	Overall status (n = 506)	Based on MBP			p-Value
		Regular MBP (n = 42; 8.3%)	Irregular MBP (n = 57; 11.3%)	No MBP (n = 407; 80.4%)	
Age in year mean (SD)	56.5 (11.3)	55.7 (11.2)	55.8 (11.1)	56.6 (11.3)	.277
<45	16.4	19.0	17.5	16.0	
45–54	28.1	23.8	24.6	29.0	
55–64	30.2	35.7	35.1	29.0	
65–74	18.2	16.7	19.3	18.2	
≥75	7.1	4.8	3.5	7.8	
Sex					<.05
Men	32.6	11.9	21.1	36.4	
Women	67.4	88.1	78.9	63.6	
Race/ethnicity					.130
White	89.5	100	84.2	89.2	
Black	4.4	0.0	5.3	4.7	
Others	6.1	0.0	10.5	6.1	
Marital status					<.05
Married	67.8	50.0	66.7	69.8	
Separated/divorced	14.6	23.8	24.5	12.3	
Widowed	9.3	11.9	0.0	10.3	
Unmarried	8.3	14.3	8.8	7.6	
Education					.323
No/some school	6.9	4.7	0.0	8.1	
Graduated from school/in college	46.5	42.9	50.9	46.3	
Graduated from college	31.1	35.7	36.8	29.8	
Master's/professional degree	15.4	16.7	12.3	15.8	
Employment					.385
Working	46.1	38.1	52.6	46.1	
Self-employed	12.3	16.7	15.8	11.3	
Retired	3.8	4.8	3.5	3.7	
Unemployed	26.1	21.4	24.6	26.8	
Other	11.7	19.0	3.5	12.1	
Tobacco-user					.079
Yes	16.4	4.8	14.0	17.9	
No	83.6	95.2	86.0	82.1	
Alcohol-user					.897
Yes	56.1	59.5	56.1	55.8	
No	43.9	40.5	43.9	44.2	
Had chronic condition/s					.948
Yes	84.0	85.7	84.2	83.8	
No	16.0	14.3	15.8	16.2	
Care time					.932
<10 hours per week	33.9	30.8	33.3	34.3	
10–40 hours per week	49.9	56.4	49.1	49.3	
>40 hours per week	16.2	12.8	17.6	16.4	
Caring for					.069
Spouse	18.8	19.1	14.0	19.5	
Children	12.2	9.5	14.0	12.3	
Parents	34.5	54.7	29.8	33.0	
Others	34.5	16.7	42.2	35.2	
Still giving care					.764
Yes	56.9	57.1	61.4	56.3	
No	43.1	42.9	38.6	43.7	
Co-resided with care recipients					.315
Yes	48.2	40.5	42.1	49.9	
No	51.8	59.5	57.9	50.1	
Provided care before					.076

(continued)

Table 1. (continued)

Variables	Overall status (n = 506)	Based on MBP			p-Value
		Regular MBP (n = 42; 8.3%)	Irregular MBP (n = 57; 11.3%)	No MBP (n = 407; 80.4%)	
Yes	37.8	50.0	45.6	35.4	
No	62.2	50.0	54.4	64.6	
Care assistance with ADL/IADL					.498
Yes	95.6	97.6	93	95.8	
No	4.4	2.4	7.0	4.2	
Life satisfaction score mean (SD)	7.6 (1.3)	7.9 (1.2)	7.7 (1.1)	7.6 (1.3)	.946
Mindfulness score mean (SD)	35.0 (5.8)	37.3 (5.6)	36.3 (6.4)	34.6 (5.7)	.334

Note. All values are in column percentage, unless otherwise specified. MBP = mind-body practice; SD = standard deviation. Significant p-values bolded.

mind-body practices (in various frequencies) versus those who did not use. The mind-body practices were more common among younger individuals, women, married, and those with higher education.

Table 2 shows the results of multiple linear regression models estimating the associations of various frequencies of mind-body practices on family caregivers' subjective well-being in the domains of life satisfaction and mindfulness, respectively. After controlling for sociodemographic factors, health, and caregiving characteristics, regular engagement in mind-body practices was independently associated with better life satisfaction ($b=0.434$, 95% CI: [0.041, 0.828], $p<.05$) and mindfulness-wellbeing ($b=2.266$, 95% CI: [0.342, 4.150], $p<.05$). However, the effect was not significant for lower frequency of mind-body practice on either subjective life satisfaction or mindfulness-wellbeing. We also conducted a follow-up analysis including care assistance with ADL/IADL and chronic health conditions as sum score. The analyses yielded the similar findings (see Supplemental Table 1).

Discussion

The current study evaluated associations between frequency of engagement in mind-body practices and levels of subjective well-being, that is, mindfulness-wellbeing and global life satisfaction in middle-aged and older adult informal caregivers in the United States. The results suggested that regular participation in mind-body practices was associated with higher levels of life satisfaction and mindfulness-wellbeing, whereas irregular practice did not have significant associations. It is important to note that these associations were identifiable even after controlling for well-established covariates of subjective well-being.

These associations are corroborated with earlier research findings that mind-body practices as a lifestyle intervention helps to improve memory functioning and subjective physical and psychological health of older adults (Mitchell et al., 2014). Our study utilizes adults in a chronically stressful role of caregiving, suggesting that

regular participation in mind-body practices has the potential to be an effective non-pharmacological intervention to promote subjective well-being among this population. In this context, in the United States, based on the 2002 to 2012 waves of the National Health Interview Survey (NHIS), it has been found that the participation rates of mind-body practices have increased in recent years; yoga accounted for nearly four-fifths of the prevalence indicating that people are using yoga more than any other mind-body practicing techniques (Clarke et al., 2015).

When looking at more nuanced findings from our study, we note that participants aged 55 to 64, 65 to 74, and 75+ (reference <45), married (reference never married), with higher levels of education (reference no/some school), and those who were employed and retired (reference other) showed a more favorable association between mind-body practices and life satisfaction. On the other hand, those who were aged 65 to 74 and women showed a more favorable association between mind-body practices and mindfulness-wellbeing. It was also evident in earlier studies that lower educational attainment is generally associated with poorer cognitive performances and psychosocial health at later ages (Assari & Bazargan, 2019; Brigola et al., 2019). The current study corroborates with earlier findings, that is, more educated informal caregivers reported better subjective well-being compared to the others of the same cohort.

Limitations

The dataset used in the current study did not provide any information on the intensity and participants' experience in mind-body practice that may have biased the current findings toward the null hypothesis. It is impossible to identify how many participants practiced yoga, tai chi, or Pilates in the dataset. This information is vital to identify whether there are any dose-response associations in observed effects. Also, there was no standardized method to confirm whether the participants had adequate technical knowledge of performing any specific mind-body practices. Many persons who practiced

Table 2. Multiple Linear Regression Model (Full Model) to Estimate the Association of Mind-Body Practice and Family Caregivers' Subjective Wellbeing (Life Satisfaction and Mindfulness) (n = 506).

Variables in wave 2	Life satisfaction (wave 2)			Mindfulness (wave 2)		
	<i>b</i>	<i>p</i> -Value	95% CI	<i>b</i>	<i>p</i> -Value	95% CI
Intercept	6.310	.001**	(5.364, 7.256)	34.208	.001**	[29.682, 38.735]
Key independent variable						
Mind-body practice (<i>ref. never</i>)						
Irregular	0.116	.505	(-0.225, 0.456)	1.167	.160	[-0.461, 2.795]
Regular	0.434	.031*	(0.041, 0.828)	2.266	.018*	[0.382, 4.150]
Covariates at W2						
Age (<i>ref. <45</i>)						
45–54	0.223	.179	(-0.103, 0.548)	0.717	.366	[-0.839, 2.273]
55–64	0.447	.009**	(0.114, 0.780)	1.161	.153	[-0.432, 2.754]
65–74	0.570	.009**	(0.144, 0.996)	2.876	.006**	[0.838, 4.913]
≥75	0.597	.037*	(0.035, 1.159)	2.496	.069	[-0.191, 5.183]
Female	0.050	.703	(-0.208, 0.308)	2.186	.001**	[0.953, 3.419]
Race/ethnicity (<i>ref. other</i>)						
White	0.056	.805	(-0.388, 0.500)	-0.244	.822	[-2.368, 1.880]
Black	0.286	.399	(-0.380, 0.952)	2.016	.214	[-1.169, 5.201]
Marital status (<i>ref. never married</i>)						
Married	0.532	.009**	(0.133, 0.931)	-1.751	.072	[-3.660, 0.159]
Separated/divorced	-0.032	.891	(-0.495, 0.430)	-1.478	.190	[-3.690, 0.734]
Widowed	0.465	.083	(-0.060, 0.991)	-1.703	.184	[-4.217, 0.812]
Education (<i>ref. no/some school</i>)						
Graduated from school	0.651	.003**	(0.219, 1.084)	0.175	.868	[-1.893, 2.244]
Graduated from college	0.715	.002**	(0.264, 1.165)	-0.213	.846	[-2.367, 1.941]
Master's/prof. degree	1.018	<.001***	(0.526, 1.511)	0.435	.717	[-1.919, 2.788]
Employment (<i>ref. other</i>)						
Working	0.570	.002**	(0.215, 0.925)	-0.236	.785	[-1.933, 1.462]
Self-employed	0.642	.004**	(0.203, 1.081)	0.973	.363	[-1.129, 3.075]
Retired	0.584	.007**	(0.159, 1.009)	-1.308	.207	[-3.339, 0.724]
Unemployed	-0.443	.168	(-1.072, 0.187)	1.071	.485	[-1.940, 4.081]
Tobacco user	-0.211	.168	(-0.511, 0.089)	0.875	.232	[-0.561, 2.311]
Alcohol user	0.032	.779	(-0.190, 0.253)	-0.599	.268	[-1.659, 0.461]
Have chronic conditions						
Care time (<i>ref. <10 hours per week</i>)						
10–40 hours per week	0.062	.603	(-0.171, 0.295)	0.031	.956	[-1.083, 1.145]
>40 hours per week	0.349	.043*	(0.011, 0.687)	1.097	.183	[-0.520, 2.714]
Caring for (<i>ref. other</i>)						
Spouse	0.070	.707	(-0.295, 0.434)	0.218	.806	[-1.526, 1.961]
Children	-0.065	.734	(-0.440, 0.310)	1.512	.098	[-0.280, 3.304]
Parents	0.137	.304	(-0.125, 0.399)	-0.104	.870	[-1.358, 1.150]
Still giving care	-0.164	.154	(-0.390, 0.062)	0.499	.365	[-0.582, 1.581]
Co-resided care recipient	-0.243	.061	(-0.497, 0.011)	-0.753	.224	[-1.968, 0.462]
Provided care before	-0.151	.195	(-0.380, 0.078)	-0.097	.862	[-1.190, 0.997]
Assist with ADL/IADL	-0.133	.618	(-0.657, 0.391)	-0.937	.463	[-3.441, 1.568]
<i>R</i> ²	0.223			0.125		
Adjusted <i>R</i> ²	0.172			0.067		

Note. *b* = unstandardized regression coefficient; CI = confidence interval.

p* < .05. *p* < .01. ****p* < .001.

Significant *p*-values bolded.

mind-body practice might consider themselves deficient in health, thereby trying mind-body practices to benefit as an alternative health approach. This motivation might be a reason that, sometimes, our study did not yield symmetrical results for both domains of subjective

well-being. Indeed, relative to participants who reported no chronic conditions (reference category), those having chronic condition/s showed a less favorable association with life satisfaction. Future research with more detailed information on the type, dose, and experience of

mind-body practices could yield more clear associations between mind-body practices and subjective well-being. Furthermore, the participants included in the study were not screened initially for cognitive impairment, which might induce some generalizability bias. Also, based on available data, it was impossible to identify the exact mind-body practice approach used by the participants; it might also induce some generalizability bias. Finally, the findings of these analyses need to be interpreted with the caveat that sample sizes per category were small (i.e., between 8 and 11% for each category of mind-body practices other than “never”).

Conclusions

Overall, the current findings suggested that mind-body practices are associated with better subjective well-being, assessed by mindfulness-specific well-being perceptions, and global life satisfaction in middle-aged and older adult caregivers. The rate of mind-body practices (for any intensity) among family caregivers was low at 20%. Future research should guide whether these findings can be replicated in other populations, and if confirmed, interventions should incorporate a broader range of mind-body interventions for caregivers as well as community-living older adults with the goal of maintaining and improving subjective well-being in the later years of life.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: We acknowledge support from the Alzheimer's Disease and Dementia Research Center at Utah State University.

ORCID iD

Kallol Kumar Bhattacharyya  <https://orcid.org/0000-0003-0689-6592>

Supplemental Material

Supplemental material for this article is available online.

References

- Abbott, R., & Lavretsky, H. (2013). Tai Chi and Qigong for the treatment and prevention of mental disorders. *The Psychiatric Clinics of North America*, 36(1), 109–119. <https://doi.org/10.1016/j.psc.2013.01.011>
- Assari, S., & Bazargan, M. (2019). Educational attainment and subjective health and well-being; diminished returns of lesbian, gay, and bisexual individuals. *Behavioral Sciences*, 9(9), 90. <https://doi.org/10.3390/bs9090090>
- Bhattacharyya, K. K., Dobbs, D., & Hueluer, G. (2022). Mind-body practice, personality traits, and cognitive performance: A 10-years study in US adults. *Gerontology & Geriatric Medicine*, 8, 23337214221083475. <https://doi.org/10.1177/23337214221083475>
- Bhattacharyya, K. K., Hueluer, G., Meng, H., & Hyer, K. (2021). Movement-based mind-body practices and cognitive function in middle-aged and older adults: Findings from the Midlife in the United States (MIDUS) study. *Complementary Therapies in Medicine*, 60, 102751. <https://doi.org/10.1016/j.ctim.2021.102751>
- Brigola, A. G., Alexandre, T. D. S., Inouye, K., Yassuda, M. S., Pavarini, S. C. I., & Mioshi, E. (2019). Limited formal education is strongly associated with lower cognitive status, functional disability and frailty status in older adults. *Dementia & Neuropsychologia*, 13(2), 216–224. <https://doi.org/10.1590/1980-57642018dn13-020011>
- Cheng, S. T., Li, K. K., Losada, A., Zhang, F., Au, A., Thompson, L. W., & Gallagher-Thompson, D. (2020). The effectiveness of nonpharmacological interventions for informal dementia caregivers: An updated systematic review and meta-analysis. *Psychology and Aging*, 35(1), 55–77. <https://doi.org/10.1037/pag0000401>
- Clarke, T. C., Barnes, P. M., Black, L. I., Stussman, B. J., & Nahin, R. L. (2018). Use of yoga, meditation, and chiropractors among U.S. adults aged 18 and over. *NCHS Data Brief*, 325, 1–8.
- Clarke, T. C., Black, L. I., Stussman, B. J., Barnes, P. M., & Nahin, R. L. (2015). Trends in the use of complementary health approaches among adults: United States, 2002–2012. *National Health Statistics Reports*, 79, 1–16.
- Cohen, S. A., Kunicki, Z. J., Nash, C. C., Drohan, M. M., & Greaney, M. L. (2021). Rural-urban differences in caregiver burden due to the COVID-19 pandemic among a national sample of informal caregivers. *Gerontology & Geriatric Medicine*, 7, 23337214211025124. <https://doi.org/10.1177/23337214211025124>
- Collins, R. N., & Kishita, N. (2019). The effectiveness of mindfulness- and acceptance-based interventions for informal caregivers of people with dementia: A meta-analysis. *The Gerontologist*, 59(4), e363–e379. <https://doi.org/10.1093/geront/gny024>
- Cramer, H., Quinker, D., Pilkington, K., Mason, H., Adams, J., & Dobos, G. (2019). Associations of yoga practice, health status, and health behavior among yoga practitioners in Germany—results of a national cross-sectional survey. *Complementary Therapies in Medicine*, 42, 19–26. <https://doi.org/10.1016/j.ctim.2018.10.026>
- Diener, E., Lucas, R. E., & Oishi, S. (2002). Subjective well-being: The science of happiness and life satisfaction. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 463–73). Oxford University Press.
- Fleming, K. M., & Herring, M. P. (2018). The effects of pilates on mental health outcomes: A meta-analysis of controlled trials. *Complementary Therapies in Medicine*, 37, 80–95. <https://doi.org/10.1016/j.ctim.2018.02.003>
- HariPrasad, V. R., Koparde, V., Sivakumar, P. T., Varambally, S., Thirthalli, J., Varghese, M., Basavaraddi, I. V., & Gangadhar, B. N. (2013). Randomized clinical trial of yoga-based intervention in residents from elderly homes: Effects on cognitive function. *Indian Journal of Psychiatry*, 55(Suppl 3), S357–S363. <https://doi.org/10.4103/0019-5545.116308>

- Hazzan, A. A., Dauenhauer, J., Follansbee, P., Hazzan, J. O., Allen, K., & Omobepade, I. (2022). Family caregiver quality of life and the care provided to older people living with dementia: qualitative analyses of caregiver interviews. *BMC Geriatrics*, *22*(1), 86. <https://doi.org/10.1186/s12877-022-02787-0>
- Hepburn, S. J., Carroll, A., & McCuaig, L. (2021). The relationship between mindful attention awareness, perceived stress and subjective wellbeing. *International Journal of Environmental Research and Public Health*, *18*(23), 12290. <https://doi.org/10.3390/ijerph182312290>
- Hughes, M. L., Agrigoroaei, S., Jeon, M., Bruzzese, M., & Lachman, M. E. (2018). Change in cognitive performance from midlife into old age: Findings from the Midlife in the United States (MIDUS) study. *Journal of the International Neuropsychological Society*, *24*(8), 805–820. <https://doi.org/10.1017/S1355617718000425>
- Jahnke, R., Larkey, L., Rogers, C., Etnier, J., & Lin, F. (2010). A comprehensive review of health benefits of qigong and tai chi. *American Journal of Health Promotion*, *24*(6), e1–e25. doi: 10.4278/ajhp.081013-LIT-24
- Judge, K. S., Menne, H. L., & Whitlatch, C. J. (2010). Stress process model for individuals with dementia. *The Gerontologist*, *50*(3), 294–302. <https://doi.org/10.1093/geront/gnp162>
- Karataş, Z., Uzun, K., & Tagay, Ö. (2021). Relationships between the life satisfaction, meaning in life, hope and COVID-19 fear for Turkish adults during the COVID-19 outbreak. *Frontiers in Psychology*, *12*, 633384. <https://doi.org/10.3389/fpsyg.2021.633384>
- Kloubec, J. (2011). Pilates: How does it work and who needs it? *Muscles, Ligaments and Tendons Journal*, *1*(2), 61–66.
- Langa, K. M., Chernew, M. E., Kabeto, M. U., Herzog, A. R., Ofstedal, M. B., Willis, R. J., Wallace, R. B., Mucha, L. M., Straus, W. L., & Fendrick, A. M. (2001). National estimates of the quantity and cost of informal caregiving for the elderly with dementia. *Journal of General Internal Medicine*, *16*(11), 770–778. <https://doi.org/10.1111/j.1525-1497.2001.10123.x>
- Langer, E. J., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues*, *56*(1), 1–9. <https://doi.org/10.1111/0022-4537.00148>
- Lim, E. J., & Park, J. E. (2019). The effects of Pilates and yoga participant's on engagement in functional movement and individual health level. *Journal of Exercise Rehabilitation*, *15*(4), 553–559. <https://doi.org/10.12965/jer.1938280.140>
- Maric, V., Mishra, J., & Ramanathan, D. S. (2021). Using mind-body medicine to reduce the long-term health impacts of COVID-specific chronic stress. *Frontiers in Psychiatry*, *12*, 585952. <https://doi.org/10.3389/fpsyg.2021.585952>
- Marin, M. F., Lord, C., Andrews, J., Juster, R. P., Sindi, S., Arseneault-Lapierre, G., Fiocco, A. J., & Lupien, S. J. (2011). Chronic stress, cognitive functioning and mental health. *Neurobiology of Learning and Memory*, *96*(4), 583–595. <https://doi.org/10.1016/j.nlm.2011.02.016>
- Matud, M. P., Bethencourt, J. M., & Ibáñez, I. (2014). Relevance of gender roles in life satisfaction in adult people. *Personality and Individual Differences*, *70*, 206–211. <https://doi.org/10.1016/j.paid.2014.06.046>
- Mitchell, A. J., Beaumont, H., Ferguson, D., Yadegarfar, M., & Stubbs, B. (2014). Risk of dementia and mild cognitive impairment in older people with subjective memory complaints: Meta-analysis. *Acta Psychiatrica Scandinavica*, *130*(6), 439–451. <https://doi.org/10.1111/acps.12336>
- Nasiri, H. A., & Bahram, J. (2008). The relationship between life's meaningfulness, hope, happiness, life satisfaction and depression in a group of employed women. *Woman in Development & Politics*, *6*(2), 157–176.
- Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *The Gerontologist*, *30*(5), 583–594. <https://doi.org/10.1093/geront/30.5.583>
- Pinquart, M., & Sörensen, S. (2007). Correlates of physical health of informal caregivers: A meta-analysis. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *62*(2), P126–P137. <https://doi.org/10.1093/geronb/62.2.p126>
- Prenda, K. M., & Lachman, M. E. (2001). Planning for the future: A life management strategy for increasing control and life satisfaction in adulthood. *Psychology and Aging*, *16*(2), 206–216. <https://doi.org/10.1037/0882-7974.16.2.206>
- Rocha, K. K., Ribeiro, A. M., Rocha, K. C., Sousa, M. B., Albuquerque, F. S., Ribeiro, S., & Silva, R. H. (2012). Improvement in physiological and psychological parameters after 6 months of yoga practice. *Consciousness and Cognition*, *21*(2), 843–850.
- Rosini, R. J., Nelson, A., Sledjeski, E., & Dinzeo, T. (2017). Relationships between levels of mindfulness and subjective well-being in undergraduate students. *Modern Psychological Studies*, *23*(1), 4. <https://scholar.utc.edu/mps/vol23/iss1/4>
- Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise: A review of comparison studies. *Journal of Alternative and Complementary Medicine*, *16*(1), 3–12.
- Ryff, C., David, M., Almeida, J. S., Ayanian, D. S., Carr, P. D., & Cleary, C. C. (2012). *National survey of midlife development in the United States (MIDUS II), 2004-2006*. CPSR04652-v6. Inter University Consortium for Political and Social Research.
- Schmaderer, M., Struwe, L., Pozehl, B., Loecker, C., & Zimmerman, L. (2020). Health status and burden in caregivers of patients with multimorbidity. *Gerontology & Geriatric Medicine*, *6*, 2333721420959228. <https://doi.org/10.1177/2333721420959228>
- Schulz, R., & Sherwood, P. R. (2008). Physical and mental health effects of family caregiving. *The American Journal of Nursing*, *108*(9 Suppl), 23–27. <https://doi.org/10.1097/01.NAJ.0000336406.45248.4c>
- Scott, S. B., Graham-Engeland, J. E., Engeland, C. G., Smyth, J. M., Almeida, D. M., Katz, M. J., Lipton, R. B., Mogle, J. A., Munoz, E., Ram, N., & Sliwinski, M. J. (2015). The effects of stress on cognitive aging, physiology and emotion (ESCAPE) project. *BMC Psychiatry*, *15*(1), 146. <https://doi.org/10.1186/s12888-015-0497-7>
- Sesker, A. A., Súilleabháin, P. Ó., Howard, S., & Hughes, B. M. (2016). Conscientiousness and mindfulness in midlife coping: An assessment based on MIDUS II. *Personality and Mental Health*, *10*(1), 29–42. <https://doi.org/10.1002/pmh.1323>
- Shani, P., Raeesi, K., Walter, E., Lewis, K., Wang, W., Cohen, L., Yeh, G. Y., Lengacher, C. A., & Wayne, P. M. (2021). Qigong mind-body program for caregivers of cancer patients: Design of a pilot three-arm randomized clinical trial. *Pilot and Feasibility Studies*, *7*(1), 73. <https://doi.org/10.1186/s40814-021-00793-4>

- Tsang, W., Chan, K. K., Cheng, C. N., Hu, F., Mak, C., & Wong, J. (2019). Tai Chi practice on prefrontal oxygenation levels in older adults: A pilot study. *Complementary Therapies in Medicine, 42*, 132–136. <https://doi.org/10.1016/j.ctim.2018.11.005>
- Uebelacker, L. A., Kraines, M., Broughton, M. K., Tremont, G., Gillette, L. T., Epstein-Lubow, G., Abrantes, A. M., Battle, C., & Miller, I. W. (2017). Perceptions of hatha yoga amongst persistently depressed individuals enrolled in a trial of yoga for depression. *Complementary Therapies in Medicine, 34*, 149–155. <https://doi.org/10.1016/j.ctim.2017.06.008>
- Ulrich-Lai, Y. M., & Herman, J. P. (2009). Neural regulation of endocrine and autonomic stress responses. *Nature Reviews Neuroscience, 10*(6), 397–409. <https://doi.org/10.1038/nrn2647>
- Van Doesum, N. J., Murphy, R. O., Gallucci, M., Aharonov-Majar, E., Athenstaedt, U., Au, W. T., Bai, L., Böhm, R., Bovina, I., Buchan, N. R., Chen, X. P., Dumont, K. B., Engelmann, J. B., Eriksson, K., Euh, H., Fiedler, S., Friesen, J., Gächter, S., Garcia, C., & Van Lange, P. A. M. (2021). Social mindfulness and prosociality vary across the globe. *Proceedings of the National Academy of Sciences of the United States of America, 118*(35), e2023846118. <https://doi.org/10.1073/pnas.2023846118>
- Wang, C. C., Li, K., Choudhury, A., & Gaylord, S. (2019). Trends in Yoga, Tai Chi, and Qigong use among US adults, 2002-2017. *American Journal of Public Health, 109*(5), 755–761. <https://doi.org/10.2105/AJPH.2019.304998>
- Woodyard, C. (2011). Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International Journal of Yoga, 4*(2), 49–54. <https://doi.org/10.4103/0973-6131.85485>