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Research Article

Socio-Demographic and Health Profiles of Midlife Women Practicing the 3D Movement Method: A Cross-Sectional Survey Interpreted Through Self-Determination Theory

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Abstract

Background: Physical activity is a key non-pharmacological strategy during the menopausal transition. The 3D Movement Method is a remote, multiplanar practice combining verbal guidance and mindful attention. Objective: To characterize socio-demographic, health, and activity profiles of midlife women practicing the method and to interpret engagement through Self-Determination Theory (SDT). Methods: A descriptive, cross-sectional online survey (April–June 2025) included women aged ≥35 years (N = 330). Measures covered socio-demographics, menopausal status, physical activity history and frequency, perceived progress across five functional domains, and standardized scales: 36-Item Short Form Health Survey (SF-36), Mindful Attention Awareness Scale (MAAS), and Multidimensional Scale of Perceived Social Support (MSPSS). Analyses were descriptive with cross-tabulations and exploratory regressions for SF-36 summaries. Results: Participants were largely highly educated, employed, globally distributed, and mostly peri- or postmenopausal, with moderate symptom intensity. Practice frequency was high: 34.5% practiced daily and 40.6% 3–6 times per week; 81.5% rated exercise importance as 10/10. Perceived progress was positive, highest for mobility (M = 1.42 on a 0–2 scale). SF-36 indicated above-average physical status (PCS = 54.48) and comparatively lower mental status (MCS = 44.95). Mean MAAS was 4.27/6 and mean MSPSS 5.23/7. Conclusions: Interpreted through SDT, engagement patterns suggest support for autonomy (flexible scheduling and adaptation), competence (clear cueing and micro-progressions), and relatedness (mediated community), which may help sustain practice. Key limitations include non-probability sampling of active practitioners and reliance on self-reported data. Longitudinal studies are needed to evaluate the method as a scalable remote health promotion option.

Keywords

3D Movement Method, Menopausal Transition, Women's Health, Physical Activity, Remote Exercises, Self-Determination Theory

1. Introduction

The menopausal transition is a complex physiological and psychosocial life stage with long-term implications for women's health and well-being [1, 5]. As life expectancy increases, many women now spend up to one-third of their

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lives postmenopausal, making menopause a public health priority [2, 6]. Typically beginning in the mid-40s, the transition reflects ovarian senescence and declining estrogen levels, with systemic effects across cardiovascular, musculoskeletal, and neurological systems that influence quality of life [1, 2]. Symptom prevalence is high, with approximately 50–80% of women reporting some combination of vasomotor disturbance, sleep disruption, fatigue, or mood changes [3]. At the same time, the intensity and impact of these symptoms vary substantially between individuals [3-5]. Cross-cultural studies show considerable variation in symptom meaning, reporting, and coping, underscoring the importance of sociocultural context in menopause research [5, 7]. Against this background, public health approaches increasingly emphasize modifiable behaviors that can support healthy aging during and after the transition [2, 6].

Physical activity is a well-supported non-pharmacological strategy for midlife women. It is associated with favorable cardiometabolic regulation, maintenance of bone and muscle, and improved psychological health [6, 8]. Regular activity is linked to lower levels of anxiety and depressive symptoms [9, 10] and to reduced menopausal symptom burden [11, 12]. Mind-body exercise is a subtype of physical activity that is particularly relevant in this context. Practices such as yoga, Pilates, and qigong combine movement with breath regulation and directed attention, engaging interoceptive awareness, emotion regulation, and neuromuscular coordination. In midlife cohorts, these approaches have been associated with improvements in bone mineral density, sleep, mood, and related outcomes [13-15]. The 3D Movement Method belongs to this broader mind-body category and is characterized by multiplanar movement sequences, verbal guidance, and an emphasis on functional tasks that reflect everyday movement demands [26-29].

Despite these benefits, participation in physical activity often declines from peri- to postmenopause and is shaped by socioeconomic position, health status, and structural inequalities [6, 16, 17]. Midlife women frequently report barriers such as fatigue, sleep disturbance, musculoskeletal discomfort, limited discretionary time related to caregiving and work overload, and variable social support [18-21]. Digital health delivery, including livestreamed sessions, asynchronous video libraries, and time-limited guided challenges, has shown feasibility and acceptability as one way to address time and access constraints [22-25]. Such formats may help extend physical-activity support to women who are unable or unlikely to attend in-person programs. The 3D Movement Method is delivered primarily through these remote channels, combining structured challenges, livestream instruction, and prerecorded sequences that can be practiced at home without equipment [26-29].

To date, research on the 3D Movement Method has been qualitative, focusing on experiential accounts, perceived changes, and the functional relevance of the practice for adult women [26, 28]. To our knowledge, there are no quantitative data describing who chooses this method, how it fits within broader movement behavior, how women perceive its impact across everyday functional domains, or how these patterns intersect with menopausal status, symptom experiences, and health-seeking strategies. Addressing this gap requires not only descriptive profiling of practitioners but also a behavioral framework capable of situating engagement within a broader motivational context, particularly in digitally delivered programs, for example, Self-Determination Theory (SDT).

SDT offers such a framework for physical activity and health behavior. It proposes that sustained participation depends on the extent to which three basic psychological needs are supported: autonomy (a sense of volition), competence (a sense of effectiveness), and relatedness (a sense of connection and acknowledgment) [30-32]. Across diverse populations, satisfaction of these needs has been associated with exercise adherence, internalization of movement practices, and maintenance of active lifestyles. In digitally delivered mind-body programs such as the 3D Movement Method, features including flexible scheduling, modifiable sequences, and mediated contact with instructors and peers may, at least conceptually, influence how these needs are experienced at the level of daily practice. In this study, SDT is used as a non-causal framework for interpreting engagement patterns among women who practice the 3D Movement Method, rather than as a directly measured construct.

The aim of this study is to address the current evidence gap by providing a quantitative description of practitioners of the 3D Movement Method. Specifically, it describes (i) socio-demographic and anthropometric characteristics; (ii) life-course physical-activity history and current activity frequency and type; and (iii) perceived progress in everyday functional domains alongside salient barriers and health-seeking behaviors during the menopausal transition. Engagement patterns and perceived progress are interpreted within an SDT-informed motivational framework to situate the findings in the context of digitally delivered physical-activity programs for midlife women.

2. Materials and Methods

2.1. Study Design and Participants

A descriptive, cross-sectional online survey was conducted between April and June 2025 among women aged 35 years and older who were active practitioners of the 3D Movement Method, accessed through purchased programs or publicly available online content. Eligibility required self-reported current practice of the 3D Movement Method. No minimum practice duration was applied to include both newcomers and long-term practitioners. Electronic informed consent in Russian or English was required. Responses from individuals younger than 35 years or identifying as male were excluded. Reporting followed the STROBE statement for

cross-sectional studies.

2.2. Recruitment and Data Collection

Recruitment was carried out through Zarina del Mar's owned digital channels, including direct emails to previous course purchasers and public Instagram and Telegram posts in Russian and English. No paid advertisements or external mailing lists were used. Detailed dissemination metrics were not retained for reporting. The questionnaire was administered in Russian and English via Google Forms (English and Russian) and Yandex Forms (Russian) and was completed asynchronously on personal devices. The survey remained open for a predefined period and was closed after two weeks with no new submissions received. After an initial period of slower response, optional access to an online workout session was provided upon questionnaire completion.

2.3. Measures and Variable Definitions

Measures covered four domains. Socio-demographic and health characteristics included age, education, employment, purchasing power, family status, region and country of residence, and selected health behaviors. Anthropometrics included self-reported height, weight, and waist circumference, which were categorized for analysis. Menopause-related items captured self-identified stage, symptom experiences across multiple domains, information sources, health-care contact, and commonly used or intended management strategies. Physical activity and 3D practice variables included life-course activity, current activity types and frequency, self-ratings of functional capacity and selected tasks, overall satisfaction with practice, clarity of explanations, and perceived progress in five everyday-relevant domains. Standardized instruments included the 36-Item Short Form Health Survey (SF-36), the Mindful Attention Awareness Scale (MAAS), and the Multidimensional Scale of Perceived Social Support (MSPSS).

The SF-36 was selected due to its extensive use in assessing health-related quality of life in midlife women [33-35]. The MAAS was included to measure dispositional mindful attention associated with mind-body practice in the 3D Movement Method [36-38]. The MSPSS was used because perceived social support is important for women navigating the menopausal transition [39-41]. Validated Russian-language versions previously applied in peer-reviewed studies were used alongside the original English versions, and scoring followed the instruments' published guidelines.

The survey was piloted prior to full deployment to evaluate clarity, relevance, and length. Item wordings and response scales were identical across the English Google Form and the Russian Google/Yandex forms. Terminology specific to the 3D Movement Method (e.g., "movement improvisation") was not defined, as it is routinely used on the instructor's (Z.M.) social media platforms.

2.4. Data Management

Data were screened for completeness and internal consistency before analysis. During early testing, a platform configuration temporarily limited multiple-choice selection; once corrected, multi-selection was enabled for all relevant items. This resulted in occasional multiple responses in single-choice items within validated scales, primarily the SF-36. Per scoring rules, these entries were treated as missing for the affected items, and SF-36 indices were calculated only for complete scorable cases. Complete-case availability was as follows: SF-36, n = 203; MAAS, n = 315; MSPSS, n = 321. For multivariable models requiring joint availability of predictors and outcomes, complete-case analysis yielded n = 65.

Blank or nonsensical free-text entries and multiple selections in single-choice items were coded as 999 and excluded from analysis. Anthropometric values provided in non-metric units were converted to metric units and categorized. No identifying information was collected; participants created a self-generated alphanumeric identifier. Submissions were checked for duplication using time-stamp and response-pattern comparisons, and no complete duplicates were identified. Russian- and English-language datasets were harmonized after quality checks and analyzed jointly; language-specific analyses were retained for potential separate reporting.

2.5. Statistical Analysis

Analyses were performed in IBM SPSS Statistics, Version 27. Descriptive statistics were presented as counts and percentages for categorical variables and as means with standard deviations or medians with interquartile ranges for continuous variables. The SF-36 was scored to produce norm-referenced Physical (PCS) and Mental (MCS) Component Summaries. The MAAS and MSPSS were scored according to their published guidelines, and results were expressed as item-mean metrics. Perceived progress in five 3D practice domains was recorded on a 0-2 scale and summarized descriptively.

Exploratory linear regressions were fitted separately for PCS and MCS using complete cases (n = 65). Identical predictors were entered in both models: practice frequency, overall satisfaction, clarity of explanations, ordinal menopausal status, the five-domain progress composite, perceived physical improvement, and perceived mental/emotional improvement. Model assumptions, including residual distributions, homoscedasticity, and independence, were reviewed. Coefficient estimates with 95% confidence intervals and model-fit indices were reported. Missing data were handled by listwise deletion. The analyses were exploratory and intended to illustrate potential associations within the dataset.

2.6. Sample Size and Rationale

No a priori sample-size calculation was undertaken, as the objective was descriptive profiling within a fixed recruitment window and exploratory examination of associations. The achieved sample of 330 respondents provides acceptable precision for descriptive web-based estimates. The complete-case sample for regression (n = 65) was appropriate for exploratory multivariable estimation, and interpretations rely on corresponding confidence intervals.

2.7. Ethical Considerations

The study protocol was approved by the Ethics Committee, TSU (No. 25410_A1_38). Participants viewed an online information sheet and provided electronic informed consent before accessing the questionnaire. Data were stored on a password-protected device with access restricted to the research team. Participation was voluntary and could be discontinued at any time.

3. Results

Analyses were conducted on the full sample (N = 330). Where item-level nonresponse occurred, percentages were calculated with the stated denominator in text or table notes. For multi-select questions, counts represented endorsements (not unique respondents), as noted in the relevant table footnotes.

3.1. Socio-demographic Characteristics

Participants were primarily 45-54 years (41.8%) or 35-44 years (35.5%), with smaller shares aged 55-64 (16.7%) and ≥65 (6.1%). A separate numeric age item (excluding one implausible value) yielded a mean of 48.66 years (SD = 9.09; median = 48; range = 35-82; IQR = 42-54; n = 329). Most reported higher education (specialist/master's 46.4%; bachelor's 24.5%); 3.9% held a PhD; 23.3% indicated other educational pathways; and 1.8% preferred not to answer. Purchasing-power categories clustered at "can afford small luxuries" (28.2%) and "save regularly and enjoy entertainment/travel" (19.4%), while 18.8% reported covering basic needs without saving and 14.8% lived comfortably without daily budgeting. The sample was geographically diverse: 57.0% lived in Europe, 20.0% in North America, and 7.9% in Asia, with respondents spanning 54 countries. Most were married (59.1%); 13.3% were single and 9.4% divorced; other statuses were less frequent. A majority had children (57.9% children without grandchildren; 23.3% both children and grandchildren). A summary of socio-demographic characteristics is presented in Table 1.

Table 1. *Sample characteristics (N = 330).*

Domain	Categories
Age bands	35-44: 117 (35.5%); 45-54: 138 (41.8%); 55-64: 55 (16.7%); ≥65: 20 (6.1%)
Education	Specialist/Master's: 153 (46.4%); Bachelor's: 81 (24.5%); PhD: 13 (3.9%); Other: 77 (23.3%); Prefer not to answer: 6 (1.8%)
Income (purchasing-power)	Small luxuries: 93 (28.2%); Save regularly/entertainment/travel: 64 (19.4%); Cover basics/no saving: 62 (18.8%); Comfortable/no daily budgeting: 49 (14.8%); Prefer not to answer: 34 (10.3%); Barely cover basics: 17 (5.2%); Luxury items/property/invest: 7 (2.1%); Other: 4 (1.2%)
Region of residence	Europe: 188 (57.0%); North America: 66 (20.0%); Asia: 26 (7.9%); Other aggregated: 38 (11.5%); South America: 5 (1.5%); Australia/Oceania: 2 (0.6%); Prefer not to answer: 5 (1.5%)
Marital status	Married: 195 (59.1%); Single: 44 (13.3%); Divorced: 31 (9.4%); Civil partnership: 22 (6.7%); Relationship - cohabiting: 16 (4.9%); Relationship - non-cohabiting: 10 (3.0%); Widowed: 5 (1.6%); Prefer not to say: 4 (1.2%); Other: 2 (0.6%); Separated: 1 (0.3%)

Note. Age (numeric): M = 48.66, SD = 9.09, median = 48, range = 35-82, IQR = 12 (Q1 = 42; Q3 = 54); n = 329 after exclusion of one implausible value.

3.2. Anthropometrics and Functional Capacity

Most respondents reported weights of 51-60 kg (32.4%) or 61-70 kg (31.5%), with fewer in higher ranges (e.g., 71-80 kg: 17.3%). Waist circumference most often fell at 71-80 cm (38.5%), followed by 81-88 cm (20.6%) and 60-70 cm (20.3%). Height clustered at 161-165 cm (32.7%) and 156-160 cm (20.0%). Functional capacity showed midlife variability: for pistol squats, most respondents reported performing the movement only with support (30.6%), being unable to perform it (23.0%), or achieving a partial range (19.4%); for push-ups, modified/knee versions only (33.6%) and 1-4 full-range repetitions (25.8%) were most common;

for deep squats, 34.5% reported ≥10 repetitions with perfect form and 30.0% reported 5-9 repetitions.

3.3. Gynecological Status and Symptom Burden

One-third of participants were premenopausal (33.3%); 55.5% were peri- or postmenopausal (19.1% and 36.4%, respectively); and 6.7% were uncertain. Symptom ratings on a 0-3 scale (0 = none to 3 = severe) indicated the highest moderate-to-severe burden for sleep disturbances (33.9%) and psychological symptoms (30.3%), with notable burden for physical discomfort and sexual health changes (each 27.0%). Considering any endorsement (mild or greater), sleep (69.1%), physical discomfort (68.8%), and psychological symptoms (67.6%) were most frequently affected. The full distribution of symptom domains is presented in Table 2.

Table 2. Menopausal status and symptom domains (N = 330).

Panel A. Menopausal status	**n (%)**
Premenopausal (regular cycles, no symptoms)	110 (33.3)
Perimenopausal (still menstruating, with symptoms)	63 (19.1)
Postmenopausal (no periods ≥ 12 months)	120 (36.4)
Unsure—with periods	14 (4.2)
Unsure—without periods	8 (2.4)
Other	15 (4.5)

Table 2. Continued.

Panel B. Symptom domains (0-3)	**0 None n (%)**	**1 Mild n (%)**	**2 Moderate n (%)**	**3 Severe n (%)**
Vasomotor	172 (52.1)	105 (31.8)	44 (13.3)	9 (2.7)
Menstrual changes	234 (70.9)	57 (17.3)	28 (8.5)	11 (3.3)
Psychological	107 (32.4)	123 (37.3)	80 (24.2)	20 (6.1)
Cognitive	142 (43.0)	111 (33.6)	63 (19.1)	14 (4.2)
Sleep	102 (30.9)	116 (35.2)	78 (23.6)	34 (10.3)
Urogenital	170 (51.5)	102 (30.9)	40 (12.1)	18 (5.5)
Physical discomfort	103 (31.2)	138 (41.8)	60 (18.2)	29 (8.8)
Sexual health	136 (41.2)	105 (31.8)	55 (16.7)	34 (10.3)
Skin/hair	127 (38.5)	125 (37.9)	58 (17.6)	20 (6.1)
Other neurological	186 (56.4)	91 (27.6)	39 (11.8)	14 (4.2)

Participants most commonly reported managing peri- and postmenopausal concerns through physical activity (179 endorsements) and dietary changes (116), often paired with mind-body strategies (92). For prospective management, most indicated they would prioritize lifestyle adjustments (n = 244) and non-medical approaches (n = 124), with smaller proportions planning to consult a physician for prescribed treatment (n = 83) or to try over-the-counter options after self-research (n = 77).

3.4. Physical activity Orientation and Practice

Physical activity held high salience (1-10 scale: M = 9.62, SD = 1.11; median = 10; mode = 10). Middle and young adulthood were the most frequently endorsed life stages for regular exercise (52.4% and 43.9%, respectively), followed by childhood (37.3%), perimenopause (32.1%), and menopause/postmenopause (28.2%); 9.1% reported never exercising regularly. Lifetime activity types were led by home exercises (73.3%), fitness/gym training (60.9%), and mind-body practices (52.4%), followed by outdoor activities (43.9%).

Current engagement was high: 40.6% practiced several times per week and 34.5% daily; smaller proportions reported 1-2 times per week (13.9%), a few times per month (5.5%), rarely (1.2%), or not currently exercising (4.2%). Primary aims for practicing the 3D Movement Method emphasized mobility and posture (89.7%), followed by physical transformation (76.1%) and lifestyle well-being (68.2%), with women's wellness (50.3%) and fitness performance (30.6%) less frequently noted. Key distributions are summarized in Table 3.

Table 3. *Practice and engagement with the 3D Movement Method (N = 330).*

Panel A. Current frequency	**n (%)**
Several times per week (3-6×)	134 (40.6)
Daily	114 (34.5)
1-2× per week	46 (13.9)
A few times per month	18 (5.5)
Not currently exercising	14 (4.2)
Rarely (< once/month)	4 (1.2)

Table 3. *Continued.*

Panel B. **Primary aims for practicing 3D**	**n (% of N)**
Mobility and posture	296 (89.7)
Physical transformation	251 (76.1)
Lifestyle well-being	225 (68.2)
Women's wellness	166 (50.3)
Fitness performance	101 (30.6)

Note. Multi-select item; counts are endorsements, not unique respondents.

3.5. Perceived Progress Across Five 3D Domains

Perceived progress across five 3D Movement Method domains was assessed on a 0-2 scale (0 = no progress, 1 = some progress, 2 = marked progress). In the full sample, mobility showed the highest mean (M = 1.42, SD = 0.65; n = 287), followed by physical (M = 1.28, SD = 0.71; n = 267) and lifestyle (M = 1.23, SD = 0.75; n = 254); women's-health (M = 1.09, SD = 0.80; n = 209) and performance (M = 1.04, SD = 0.73; n = 192) were closer to the midpoint of the scale.

By age group, mobility remained the highest domain in each band. Performance was lower in the youngest and oldest groups, with comparatively higher means in ages 55-64. The composite progress sum (listwise n = 159) had a median of 6 (IQR = 4-9), with mild left skew (−0.289) and platykurtosis (−0.885). Domain means by age group are shown in Table 4.

Table 4. Perceived progress (0-2) by age group: means (SD), n.

Domain	35-44	45-54	55-64	65+
Physical	1.35 (0.69), 89	1.23 (0.74), 119	1.35 (0.64), 46	1.15 (0.80), 13
Mobility	1.47 (0.68), 94	1.40 (0.62), 125	1.48 (0.65), 50	1.11 (0.58), 18
Women's-health	1.14 (0.79), 65	1.05 (0.80), 99	1.13 (0.81), 38	0.86 (0.90), 7
Performance	0.98 (0.73), 59	1.02 (0.74), 82	1.24 (0.68), 38	0.77 (0.73), 13
Lifestyle	1.19 (0.75), 85	1.29 (0.75), 110	1.23 (0.77), 44	1.07 (0.70), 15

Note. 0 = no progress, 1 = some progress, 2 = marked progress; small cell sizes in the 65+ group reduce precision.

3.6. Validated Instruments (SF-36, MAAS, MSPSS)

SF-36 descriptive scores (available cases n = 203) indicated a mean Physical Component Summary (PCS) of 54.48 (SD = 7.51) and a mean Mental Component Summary (MCS) of 44.95 (SD = 11.75). Complete-case exploratory regressions (N = 65) modeled PCS and MCS separately using identical predictors: practice frequency, overall satisfaction, clarity of explanations, ordinal menopausal status, five-domain progress sum, self-rated physical progress, and self-rated mental/emotional progress.

The PCS model was statistically significant (F[7, 57] = 2.20, p =.048; R^2 =.212; adjusted R^2 =.116; SE = 8.00; Durbin-Watson = 2.24). More advanced menopausal status was associated with lower PCS (B = −2.21, SE = 1.06, p =.042), whereas higher self-rated physical progress was associated with higher PCS (B = 0.90, SE = 0.42, p =.037). The MCS model was not significant overall (F[7, 57] = 1.45, p =.203; R^2 =.151; adjusted R^2 =.047; SE = 12.18; Durbin-Watson = 2.36). MAAS item-mean was 4.27 (SD = 0.88; n = 315). MSPSS item-mean was 5.23 (SD = 1.31; n = 321). Descriptive and regression results are summarized in Table 5.

Table 5. Validated instruments.

Panel A.				
Metric	**SF-36 PCS**	**SF-36 MCS**	**MAAS (item-mean 1-6)**	**MSPSS (item-mean 1-7)**
Valid n	203	203	315	321
Missing n	127	127	15	9
Mean	54.48	44.95	4.27	5.23
SD	7.51	11.75	0.88	1.31
Skewness	−0.35	−0.59	−0.40	−0.94
SE Skew	0.17	0.17	0.14	0.14
Kurtosis	0.45	−0.50	−0.18	0.67
SE Kurt	0.34	0.34	0.27	0.27
Shapiro-Wilk	0.98	0.95	0.98	0.93
p	.009	<.001	.001	<.001
Min	32.65	14.61	1.33	1.00
Max	76.59	65.48	6.00	7.00

Note. SF-36 = 36-Item Short Form Health Survey; PCS = Physical Component Summary; MCS = Mental Component Summary; MAAS = Mindful Attention Awareness Scale; MSPSS = Multidimensional Scale of Perceived Social Support. MAAS and MSPSS are reported on item-mean metrics (1-6 and 1-7, respectively).

Table 5. Continued.

Panel B.		
Exploratory linear regressions (complete cases N = 65)	**PCS: B (SE), p**	**MCS: B (SE), p**
Intercept	55.245 (6.589), <.001	27.286 (10.024),.009
Practice frequency	−0.978 (1.196),.417	2.721 (1.819),.140
Satisfaction	0.021 (0.120),.861	0.107 (0.183),.562
Menopausal status (ordinal)	−2.213 (1.061),.042	1.993 (1.614),.222
Explanation clarity	0.312 (0.613),.613	1.090 (0.933),.247
Five-domain progress sum	0.236 (0.395),.553	−0.201 (0.602),.739
Physical progress (single-item)	0.902 (0.422),.037	−1.586 (0.642),.017
Mental progress (single-item)	−0.795 (0.377),.040	0.625 (0.574),.281
Model fit	R^2 =.212; adj. R^2 =.116; F(7, 57) = 2.20, p =.048; SE = 8.00; DW = 2.24	R^2 =.151; adj. R^2 =.047; F(7, 57) = 1.45, p =.203; SE = 12.18; DW = 2.36

Note. Predictors were identical in both models. Given the modest complete-case sample, MCS coefficients should be interpreted cautiously in light of the nonsignificant omnibus test.

4. Discussion

4.1. Interpretation of Results

In this cohort, 69.1% reported at least mild sleep disturbance, 68.8% physical discomfort, and 67.6% psychological symptoms, with roughly one-third indicating moderate-to-severe intensity. These values fall within ranges commonly observed in midlife and menopausal samples, where symptom prevalence often spans about 50%-80% depending on domain and cohort [3]. On norm-based scoring of the SF-36 (population mean = 50, SD = 10), the observed Physical Component Summary (PCS = 54.48, SD = 7.51) indicated above-average physical status, whereas the Mental Component Summary (MCS = 44.95, SD = 11.75) was at or modestly below community averages reported for adults in midlife, suggesting relatively preserved physical functioning alongside notable psychological burden [33, 34].

Management preferences in this sample skewed toward non-pharmacological strategies: most respondents prioritized physical activity and dietary changes, and a minority anticipated physician-directed pharmacotherapy. Contemporary survey and utilization studies similarly report strong interest in self-management and non-hormonal approaches, alongside relatively low uptake of hormone therapy in routine care, although preferences vary by age, education, and clinical context [1, 2, 10].

The socio-demographic profile—high educational attainment and financial stability—resembled that of early adopters of digital health and fitness technologies, who disproportionately have higher education and income and greater digital literacy [22, 24]. Recruitment via social media and an instructor mailing list likely selected a proactive, digitally literate convenience sample, which is informative for program design within digital ecosystems but limits population generalizability.

The wide geographic distribution of respondents reflected the reach of remote, equipment-free formats that expanded during the COVID-19 period and remain embedded in post-pandemic routines [22, 24]. Cross-cultural research has documented variability in menopausal symptom appraisal and reporting across regions and subgroups; although some earlier work suggested lower vasomotor symptom prevalence in parts of Asia, later systematic evidence indicates rates comparable to Western cohorts [3, 5, 16]. Given the English/Russian administration and global participation, culturally sensitive validation and stratified analyses are warranted to test whether engagement patterns, perceived benefits, and help-seeking differ by language and region.

4.2. Interpretation of Results Through SDT

Within SDT, autonomy refers to volition and self-endorsed choice, competence to perceived effectiveness and mastery, and relatedness to a sense of connection and acknowledgment. The present pattern of findings can be read as consistent with a needs-supportive context across macro (program and lifestyle), meso (platform and challenge structures), and micro (single session) levels of engagement (Figure 1).

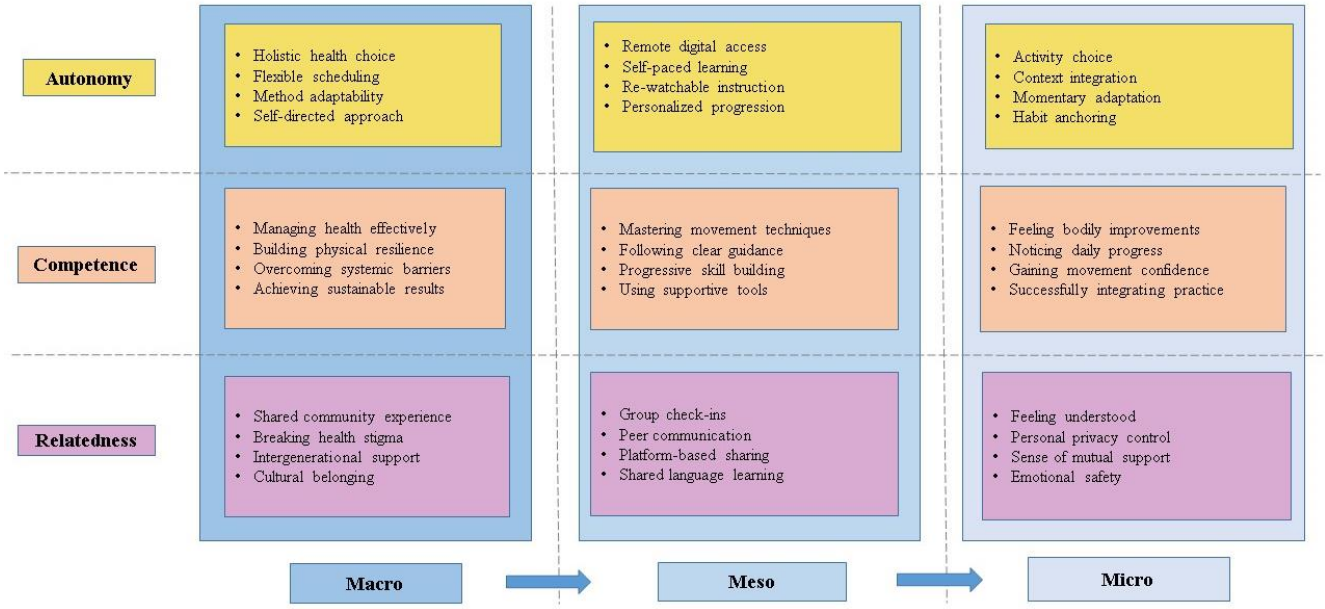

Figure 1. *Self-Determination Theory across Macro, Meso and Micro Levels for the 3D Movement Method practitioners.*

Autonomy appeared to be supported at multiple levels. At the macro level, respondents prioritized lifestyle-based strategies, including physical activity and dietary changes, over pharmacotherapy for peri- and postmenopausal concerns, indicating a preference for self-directed management. At the meso level, remote, on-demand access provided scheduling control and may be consistent with the high practice frequency observed, with 75.1% reporting practice three or more times per week, a pattern also reported in mobile- and web-based interventions for midlife women. At the micro level, participants reported selecting specific exercises and integrating brief movement snacks into daily routines, reflecting immediate behavioral choice and self-regulation within the 3D Movement Method.

Competence may be interpreted as supported through scaffolded, principle-based practice. At the meso level, the method's emphasis on detailed verbal instruction for movement chains and tension lines offered concrete cues for self-assessment and progression. At the micro level, respondents described adapting tasks to their current capacity and reported perceived gains across domains, with mean progress scores highest for mobility (1.42 out of 2) and physical function (1.28 out of 2). The positive association between self-rated physical progress and SF-36 PCS in exploratory regression analysis (B = 0.90, p =.037) situated perceived improvements within a broader functional profile, although the cross-sectional design did not permit inferences about directionality.

Relatedness was less directly measured but could be considered in relation to both program context and global support. The 3D Movement Method is delivered through digital channels that can incorporate instructor communication and community-facing content, which may offer opportunities for connection even in remote formats. In this survey, elevated MSPSS scores (mean = 5.23 out of 7) indicated high perceived social support; however, the instrument assessed global support rather than support specific to 3D practice. Taken together, the pattern of high engagement, reported progress, and strong global support is congruent with SDT's propositions about how needs-supportive contexts relate to sustained participation, without implying that psychological needs fulfillment was directly measured in this study.

4.3. Limitations

This study had several limitations. First, the cross-sectional design precluded causal inference regarding associations between 3D Movement Method engagement, perceived progress, and health-related quality of life. Second, recruitment through social media and instructor mailing lists likely selected individuals already oriented toward health behavior change and comfortable with digital formats, which limited external validity. Third, the survey was administered in Russian and English using validated versions of standardized instruments, but no separate cultural validation was undertaken for each participating country, and English-language responses encompassed diverse national and cultural backgrounds; countries were unequally represented. Fourth, several items allowed multiple or partial responses, yielding unequal denominators and missingness in standardized scales; resulting complete-case analyses, including the SF-36 regression models, were based on modest subsamples. Anthropometrics and progress indices were self-reported, introducing potential reporting biases. All respondents were active 3D practitioners, preventing comparison with non-practitioners or with clearly defined newcomer versus

long-term cohorts.

4.4. Future Directions

Future longitudinal designs should examine whether and how perceived satisfaction of autonomy, competence, and relatedness is associated with adherence, symptom trajectories, and changes in quality of life across the menopausal transition, using validated SDT-based instruments such as basic psychological needs satisfaction and behavioral regulation in exercise. Sampling strategies that explicitly differentiate newcomers, short-term, and long-term practitioners and document practice dose, intensity, and specific exercise families would clarify dose-response patterns. Integrating objective movement or recovery markers (e.g., wearable indices of mobility or balance tests) could complement self-reported progress and functional capacity. Cultural-linguistic validation and stratified analyses by language group and region are needed to address heterogeneity in symptom meaning, reporting, and engagement. Mixed-methods work, combining surveys with qualitative interviews or digital ethnography, could further explore how instructor communication, perceived community, and contextual cues shape motivation, perceived competence, and adherence in remote mind-body formats.

5. Conclusion

In this digitally recruited cohort of midlife women practicing the 3D Movement Method, symptom burden in sleep, physical discomfort, and psychological domains was substantial, while physical health-related quality of life was above normative averages and mental health-related quality of life was modestly lower. Respondents reported high salience of physical activity, frequent engagement, and perceived progress in mobility and physical domains, alongside strong global perceived social support. Interpreted through SDT, these patterns suggest that the 3D Movement Method may provide an autonomy-supportive, competence-relevant, and socially meaningful context for many midlife women. Flexible scheduling and modifiable, equipment-free sequences may encourage self-initiated practice; principle-based instruction may support body awareness and skill development; and engagement within a broader social and digital ecosystem may relate to perceived social support.

Abbreviations

SDT	Self-Determination Theory
MSPSS	Multidimensional Scale of Perceived Social Support
MAAS	The Mindful Attention Awareness Scale
SF-36	36-Item Short Form Health Survey
SF-36 PCS	Physical Component Summary Score of the 36-Item Short Form Health Survey
SF-36 MCS	Mental Component Summary Score of the 36-Item Short Form Health Survey

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Author Contributions

Zarina Manaenkova: Conceptualization, Resources, Writing – review & editing

Ekaterina A. Santanna: Formal Analysis, Methodology, Writing – original draft

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Data Availability Statement

The data are available from the corresponding author upon reasonable request.

Conflicts of Interest

Ekaterina A. Santanna provides consulting services to LLC Zarina del Mar. Zarina Manaenkova (Zarina del Mar) is the developer of the 3D Movement Method. To minimize potential bias, Zarina Manaenkova was not involved in data collection, processing, or statistical analysis during this research. The authors declare no other conflicts of interest.

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Biography

Zarina Manaenkova, widely recognized as Zarina del Mar, is a movement specialist and wellness innovator who developed the 3D workout system, a biomechanically-grounded approach to fitness. Her method is founded on the principle of "movement snacks" - brief, mindful exercises dispersed throughout the day to counteract sedentarism and restore natural motor function. This approach integrates somatic practices to enhance neural-body connection and induce a meditative state. Her 3S framework (Smart, Short, Simple) prioritizes accessibility and sustainability, shifting the fitness paradigm from one of punitive intensity to one of joyful, conscious movement. The primary outcomes of her work are improved flexibility, functional mobility, and overall well-being. Manaenkova's influence lies in promoting movement as a tool for self-awareness and vitality, making evidence-based practices accessible to a diverse population and transforming the public approach to physical activity.

Ekaterina A. Santanna holds a degree from Shanghai Jiao Tong University's School of Media and Communication and a Master's in Human Development: Psychology, Genetics, and Neuroscience from Tomsk State University. As a member of The Menopause Society, her work focuses on menopausal transitions, symptom management strategies, and digital health solutions. She also examines media representations of menopause, the role of health influencers, and effective medical communication. Her interdisciplinary approach bridges psychology, media studies, and healthcare to improve women's well-being during midlife transitions.

Research Field

Zarina Manaenkova: Body awareness practices.

Ekaterina A. Santanna: Menopausal health, Women's midlife transitions, Medical communication, Digital health solutions, Symptom management strategies, Media representation of health, Health influencer impact.