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# The Effectiveness of Wellness Coaching for Improving Quality of Life

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## Abstract

**Objective:** To learn more about the potential psychosocial benefits of wellness coaching. Although wellness coaching is increasing in popularity, there are few published outcome studies.

**Patients and Methods:** In a single-cohort study design, 100 employees who completed the 12-week wellness coaching program were of a mean age of 42 years, 90% were women, and most were overweight or obese. Three areas of psychosocial functioning were assessed: quality of life (QOL; 5 domains and overall), depressive symptoms (Patient Health Questionnaire-9), and perceived stress level (Perceived Stress Scale-10). Participants were recruited from January 1, 2011, through December 31, 2011; data were collected up to July 31, 2012, and were analyzed from August 1, 2012, through October 31, 2013.

**Results:** These 100 wellness coaching completers exhibited significant improvements in all 5 domains of QOL and overall QOL ($P<.0001$), reduced their level of depressive symptoms ($P<.0001$), and reduced their perceived stress level ($P<.001$) after 12 weeks of in-person wellness coaching, and they maintained these improvements at the 24-week follow-up.

**Conclusion:** In this single-arm cohort study (level 2b evidence), participating in wellness coaching was associated with improvement in 3 key areas of psychosocial functioning: QOL, mood, and perceived stress level. The results from this single prospective cohort study suggest that these areas of functioning improve after participating in wellness coaching; however, randomized clinical trials involving large samples of diverse individuals are needed to establish level 1 evidence for wellness coaching.

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Many employees struggle with behavioral health issues, and wellness coaching is becoming an increasingly prevalent strategy to help employees improve their health and well-being.[1,2] Numerous health insurance plans now use wellness coaches, many individuals seek out wellness coaching on their own, and many companies offer wellness coaching to their employees.[3,4] Despite the popularity of wellness coaching, there is limited published documentation on the potential effectiveness of wellness coaching. A review of published studies identified a large multicenter randomized study of patients with coronary heart disease in which investigators found improvements in cardiovascular health[5] after participating in wellness coaching, and these improvements were maintained over time.[6] Wellness coaching has also been found to improve physical activity level[7] and effectively treat weight management.[8] More recently, Mettler and colleagues[9] found that participation in wellness coaching improved motivation, importance, and confidence for making positive health behavior change in such areas as life satisfaction, energy level, healthy weight, physical activity, nutrition, managing health, and mental fitness. Clearly, more outcome studies are warranted, given the increasing prevalence of wellness coaching in our country. However, given that there is limited documentation on potential psychosocial benefits associated with wellness coaching, power calculations for mood or psychosocial domains cannot be calculated, nor can attrition rates be estimated to guide the design of randomized clinical trials. In addition, participants enter wellness coaching with a range of goals, and their wellness goals may

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change during the wellness coaching process. Therefore, before conducting a large randomized clinical trial (level 1 evidence),[10] initial estimates of effect sizes of key areas of psychosocial functioning improvements should be obtained, more needs to be learned about the wellness coaching process, and level 2 evidence for wellness coaching should be established.

Quality of life (QOL) is a key area of psychosocial functioning, and QOL incorporates both physical and mental health. Quality of life consists of overall QOL and the 5 domains of physical, social, emotional, cognitive, and spiritual functioning.[11] The concept of wellness is similar to QOL because both represent more than just the absence of suffering or disease. Both incorporate happiness, meaning and purpose in life, cognitive functioning, spirituality, and having a community. Although it has been reported that participation in physical activity[9] and participation in a combined studio cycling and stress management program[12] improve QOL, how wellness coaching affects QOL is not well documented. In addition to QOL, depression and having a high stress level are important psychosocial issues in the workplace[9]; however, there is a lack of evidence regarding the potential effectiveness of wellness coaching in improving these areas of psychosocial functioning. Therefore, the primary aims of this single-arm cohort study were to examine potential improvements in QOL,[13] depressive symptoms, and perceived stress level after 12 weeks of in-person wellness coaching and to provide initial effect size estimates in these 3 areas. The secondary aims were to examine the maintenance of potential improvements over time and to contribute to the growing level 2 evidence for wellness coaching.

## PATIENTS AND METHODS

### Wellness Coaching Program

Wellness coaching at the employee wellness center is a confidential partnership that focuses on the member taking action, which moves him or her toward optimum health. Wellness coaches at the employee wellness center have 4-year degrees and received training and certification from the Mayo Clinic Wellness Coaching Training Program.[14] The wellness coaching training platform engages learners through Web-based distance learning, on-site course instruction, and peer-to-peer practice coaching applying skills and principals taught in the course work. The foundational elements provided in course instruction prepare wellness coaches in the areas of client relationship development, trust and rapport, identifying client values, strengths and health behavior desires, communication skills, motivational interviewing techniques, goal structure and assessment, and professional ethics. This wellness coaching model has a strength-based focus. Strength-based approaches are grounded in contributions from counseling psychology, positive psychology, prevention research, social work, solution-focused therapy, and motivational interviewing. Using a strength-based approach, the wellness coaches discuss with the individual the incorporation of 5 Es: (1) *e*ngage, build a trusting relationship with the individual; (2) *e*xplore, assist individuals in identifying their values and desires; (3) *e*nvision, facilitate a personal vision for wellness; (4) *e*xperiment, enhance self-confidence for wellness and transform values and goals into action; and (5) *e*volve, facilitate and promote long-term positive lifestyle changes.

The current wellness coaching program starts with a 60- to 120-minute initial session to create a vision, to discuss the participant's strengths, motivation for change, challenges and personal goals, and to determine strategies to achieve the participant's wellness goals. The initial session is followed by 11 weekly 30- to 60-minute in-person follow-up sessions to discuss and complete self-identified wellness goals. The follow-up sessions allow for the wellness coach and participant to discuss action steps taken toward the goal and lessons learned in exploring the behavior change methods to assist the individual in successful continued efforts. Employees attend the wellness coaching sessions on their own time; and, at the time of the study, wellness coaching was a no-cost benefit of the employee wellness center. Previous research[13] examined 127 participants' goals when they started wellness coaching. Many participants had more than 1 goal for wellness coaching; and these are listed in order of the most frequently identified goals for wellness coaching: lose weight or maintain current weight loss (100%), manage or prevent injury (93%), improve well-being (82%), improve family well-being (65%), improve health risks or


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medical conditions (56%), improve productivity (49%), improve job satisfaction (39%), increase physical activity (37%), improve sleep (26%), and improve finances (23%). During the weekly sessions, participants discuss their experiences over the past week, identify barriers they encountered, and set goals for the next week. Goals are individualized and based on the participant's motivational level. Long-term goals were reviewed at least monthly to ensure that the participants were making progress toward their long-term goals or, in light of new personal information, their long-term goals could be adapted and revised. For example, participants might enter coaching for weight management but then learn that to succeed at weight management, they need to enhance their stress management skills or achieve better work-life balance. Participants were also encouraged to use personalized tracking systems, either Web-based or written, to promote behavior change.

## Study Population

The study goal was to describe the potential psychosocial outcomes associated with the wellness coaching experience. Although a nonrandomized controlled study is unable to make causality attributions, a single-cohort study design was selected because the study aim was to document the potential outcomes from an existing clinical program in which participants are seeking a clinical service and a wellness coaching program is designed to capitalize on the participants' motivation by enrolling them in wellness coaching when they are motivated to do so. Therefore, a control group would not have been practically or ethically feasible and a wait-list control group would fail to engage participants when they are ready to make positive lifestyle changes. This study design provides level 2 evidence. The sample size was determined before the enrollment of 100 completers to obtain precise estimates of the outcome measures. With a sample size of 100 participants, the mean can be determined with an error margin of ±0.2 SD (e.g., mean QOL score). Of note, 0.5 is a clinically meaningful effect size[15] and a sample size of 100 participants provides sufficient power to detect effect sizes even smaller than 0.5. All 100 completers provide 80% power to detect effect sizes as small as 0.285 with a 2-sided paired *t* test (type I error rate of 5%). This sample size also provides greater than 99% power to detect an effect size of 0.5. Before starting recruitment for the study, a *completer* was defined as a person who participated in the 3-month wellness coaching program, demonstrated by attending 75% or more (9 of 12) of the wellness coaching sessions. Inclusion criteria included persons who were 18 years or older, an employee, a new wellness coaching participant with commitment to full participation in the 12-session 3-month wellness coaching program and the follow-up assessment, able to complete study questionnaires, a member of the wellness center, and able to provide written informed permission for participation in the study. Exclusion criteria were inability to provide informed consent or previous participation in wellness coaching. During the study enrollment period, 184 individuals participated in wellness coaching and 135 were employees; all employees who started wellness coaching were invited to participate in the study at their initial wellness coaching appointment, and of these, 130 employees (96%) enrolled in the study.

## Study Measures

This study was approved by our institutional review board, and participants provided written informed consent. Study participants completed the study questionnaires before their first wellness coaching session (baseline, week 0), at the end of wellness coaching (week 12), and at the 24-week follow-up (week 24, ±4 weeks). If they were unable or unwilling to attend an in-person follow-up session, 3 attempts were made to have the study participant complete the forms through mail or e-mail.

To obtain information regarding their medical history, their electronic medical records for the past 3 years were abstracted for the following clinical characteristics: any indicators of heart problems, diabetes, high blood pressure, or obstructive sleep apnea, as well as number of prescription medications and number of clinic visits in the past 3 years.

**Quality of Life.** Our research team developed a series of 6 QOL items that ask adults to rate their level of functioning on a scale ranging from 0 (as bad as it can be) to 10 (as good as it can be). The 6 items inquire about overall QOL and the 5 domains of QOL: (1) mental well-being, (2) physical well-being, (3) emotional well-being, (4) social well-being, and (5) spiritual

well-being.[16,17] Previous research using these items has reported that employees with a high stress level have a poor QOL[18] and usage of a wellness center improves QOL.[9]

**Depressive Symptoms.** The Patient Health Questionnaire-9 (PHQ-9)[19] was used to assess self-reported depressive symptoms. Scores can range from 0 to 27, with higher scores indicating greater depressive symptom severity. Scores of 4 to 9 indicate mild depression, 10 to 14 indicate moderate depression, and higher than 15 indicate moderate to severe depressive symptom severity.

**Perceived Stress.** The Perceived Stress Scale is a 10-item scale designed to measure the degree to which life situations are appraised as stressful. Respondents indicate how often they felt or thought a certain way: 0 (never), 1 (almost never), 2 (sometimes), 3 (fairly often), and 4 (very often). The scale was created for use in the general population (those with at least a junior high school education level). Scores can range from 0 to 40, with higher scores indicating greater stress. The mean score for female participants in a national area probability—based telephone survey of 1427 female residents 18 years or older was 13.7±6.6[20-22]; and in a 2009 telephone survey of 1037 employed adults living in the United States, the mean score was 16.2±7.3.[23]

### Statistical Analyses

The data were summarized at baseline, 12 weeks after enrolling in the study (completion of wellness coaching), and 24 weeks, with means and SDs for continuous measures and frequencies and percentages for categorical measures. The magnitude of the change from baseline to follow-up was illustrated with effect sizes[15] defined as the absolute value of the difference in means from baseline to follow-up divided by the baseline SD. Comparisons of the outcomes between baseline and each follow-up were assessed with repeated-measures regression models using generalized estimating equations to account for within-individual correlation. Linear regression was used for the continuous outcomes (QOL, Perceived Stress Scale, PHQ-9), and logistic regression was used for depression severity (dichotomized as mild vs mild-severe). Within each regression model, the primary predictor was time (1, 2, or 3). Furthermore, analyses were adjusted for the following characteristics via multivariable regression models: age, body mass index (BMI), marital status (married or not), education level (23-level ordinal variable), individual health conditions (high blood pressure or obstructive sleep apnea), and number of clinician visits in the past year (ordinal). Interactions between each adjustment variable with time were considered to determine whether the effect from baseline to follow-up differed by these other characteristics. *P* values of less than .05 were considered statistically significant. All analyses were performed using SAS version 9 (SAS Institute Inc, Cary, NC).

## RESULTS

A total of 130 participants were recruited and enrolled in the study; of these, 100 participants completed at least 9 wellness coaching sessions and provided data at 12 weeks and 92 participants provided follow-up data at 24 weeks. The completion rate for wellness coaching in this project (77%) is similar to the completion rates of other wellness coaching studies (72%,[5] 83%,[8] 88%[24]). The 100 wellness coaching completers were the primary focus of these analyses. The majority (90%) were female participants, and the mean age was 41.8±12.0 years. The mean BMI at baseline was 32.3±7.9, with the majority being obese (55%) or overweight (23%). Most were married (56%) or living with a partner (9%). Nearly all participants had at least some college or university education (59%), graduate school education (32%), or postgraduate school education (5%). The most common health condition noted in the medical record was high blood pressure (20%), followed by obstructive sleep apnea (18%), and heart disease and diabetes were less common (6% each). The participants were found to be high users of health care in general, with many having had 7 to 10 clinic visits in the past 3 years (19.2%) or more (66.7%). In addition, the mean number of prescription medications was 3 (Table 1).

Significant differences in mean score from baseline to 12-week follow-up were found for overall QOL, 5 domains of QOL, depressive symptoms, and perceived stress level ($P<.0001$). No significant differences were found between 12 and 24 weeks, suggesting that any improvements made were maintained through the 24-week follow-up visit. At


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**TABLE 1. Demographic characteristics of 100 Wellness Coaching Participants[a,b]**

| Variable | Values |
|---|---|
| Age at enrollment (y) | |
| Mean ± SD | 41.8±12.0 |
| Range | 22.0-66.0 |
| Sex: female | 90 (90.0) |
| White | 94 (94.0) |
| BMI | |
| Mean ± SD | 32.3±7.9 |
| Range | 19.5-57.4 |
| BMI category | |
| Normal | 22 (22.0) |
| Overweight | 23 (23.0) |
| Obese | 55 (55.0) |
| Marital status | |
| Married | 56 (56.0) |
| Widowed | 1 (1.0) |
| Separated | 1 (1.0) |
| Divorced | 11 (11.0) |
| Not married, living with partner | 9 (9.0) |
| Not married | 22 (22%) |
| Education level | |
| High school (coded as 9-12) | 4 (4.0) |
| College or university (coded as 13-17) | 59 (59.0) |
| Graduate school (coded as 18-22) | 32 (32.0) |
| Postgraduate (coded as 23) | 5 (5.0) |
| Health status information | |
| Heart problems | 6 (6.0) |
| Diabetes | 6 (6.0) |
| High blood pressure | 20 (20.0) |
| Sleep apnea | 18 (18.2) |
| No. of clinic visits in past 3 y | |
| Missing | 1 |
| 1-3 | 6 (6.1) |
| 4-6 | 8 (8.1) |
| 7-10 | 19 (19.2) |
| >10 | 66 (66.7) |
| No. of prescription medications | |
| 0 | 21 (21.0) |
| 1 | 20 (20.0) |
| 2-4 | 35 (35.0) |
| 5+ | 24 (24.0) |
| Mean ± SD | 3.0±3.1 |
| Range | 0-12 |

[a]BMI = body mass index.
[b]Values are presented as mean ± SD and as No. (%).

baseline, the mean QOL measures ranged from 6 to 7.6 on a scale ranging from 0 (lowest QOL) to 10 (highest QOL). The effect size from baseline to 12 weeks was highest for physical well-being (0.8) and lowest for spiritual well-being (0.4). The perceived stress level decreased between baseline and 12 weeks from a mean of 14.3 to 11.0 (effect size 0.5). Depression scores (PHQ-9) also decreased in the first 12 weeks from a mean of 4.6 to 2.1 (effect size 0.6). Furthermore, the percentage of participants with mild (32%) or moderate to severe (12%) category of depressive symptoms decreased to 11% and 1%, respectively, at 12 weeks. Of those who noted being bothered by at least 1 symptom on the PHQ-9 at baseline, 47.9% noted that these problems made it "somewhat" to "very difficult" to do work or take care of things at home or get along with other people. This percentage decreased to 28.2% at 12 weeks. The self-reported number of mental stress management or relaxation techniques performed in the "past week" increased from a mean of 2.7 to 5.5 (effect size 0.7; Table 2).

By using multivariable regression models, we adjusted for age, BMI, marital status, education, high blood pressure, obstructive sleep apnea, number of clinic visits, and number of prescription medications. Because very little change was observed between 12 and

**TABLE 2. Improvements in Quality of Life, Depressive Symptoms, and Perceived Stress Level[a,b]**

| Variable | Baseline (N=100) | Postcoaching (12 wk) (N=100) | 3-mo follow-up (n=92)[c] |
|---|---|---|---|
| Overall mental well-being | | | |
| Mean ± SD | 7.6±1.4 | 8.3±1.1 | 8.3±1.0 |
| Range | 3.0-10.0 | 5.0-10.0 | 6.0-10.0 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.5 | 0.5 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Overall physical well-being | | | |
| Mean ± SD | 6.0±1.6 | 7.3±1.4 | 7.3±1.3 |
| Range | 1.0-10.0 | 3.0-10.0 | 3.0-10.0 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.8 | 0.8 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Overall emotional well-being | | | |
| Mean ± SD | 7.1±1.6 | 7.9±1.2 | 8.1±1.1 |
| Range | 3.0-10.0 | 4.0-10.0 | 5.0-10.0 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.5 | 0.6 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Level of social activity | | | |
| Mean ± SD | 6.7±1.9 | 7.7±1.4 | 8.0±1.5 |
| Range | 2.0-10.0 | 4.0-10.0 | 4.0-10.0 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.5 | 0.7 |
| *P* value[d] | Reference | <.0001 | <.0001 |

*Continued on next page*

**TABLE 2. Continued**

| Variable | Baseline (N=100) | Postcoaching (12 wk) (N=100) | 3-mo follow-up (n=92)[c] |
|---|---|---|---|
| Overall spiritual well-being | | | |
| Mean ± SD | 7.3±1.8 | 8.0±1.3 | 8.0±1.4 |
| Range | 3.0-10.0 | 5.0-10.0 | 4.0-10.0 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.4 | 0.4 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Overall QOL | | | |
| Mean ± SD | 7.4±1.3 | 8.1±1.2 | 8.2±0.9 |
| Range | 3.0-10.0 | 5.0-10.0 | 6.0-10.0 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.5 | 0.6 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Perceived Stress Scale | | | |
| Mean ± SD | 14.3±6.2 | 11.0±5.1 | 10.7±4.9 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.5 | 0.6 |
| Range | 2.0-28.0 | 1.0-25.0 | 0.0-23.0 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Mental stress management or relaxation techniques, no. of times done in the past week | | | |
| Mean ± SD | 2.7±3.9 | 5.5±8.2 | 5.1±6.9 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.7 | 0.6 |
| Range | 0.0-25.0 | 0.0-50.0 | 0.0-35.0 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Depressive symptoms: PHQ-9 score | | | |
| Mean ± SD | 4.6±4.0 | 2.1±2.4 | 2.5±2.5 |
| Effect size (=\|difference from baseline\|/SD at baseline) | | 0.6 | 0.5 |
| Range | 0.0-17.0 | 0.0-15.0 | 0.0-12.0 |
| *P* value[d] | Reference | <.0001 | <.0001 |
| Depression severity (PHQ-9 score) | | | |
| 0-4 (minimal) | 56 (56.0) | 88 (88.0) | 75 (81.5) |
| 5-9 (mild) | 32 (32.0) | 11 (11.0) | 15 (16.3) |
| 10+ (moderate to severe) | 12 (12.0) | 1 (1.0) | 2 (2.2) |
| *P* value[d,e] | Reference | <.0001 | <.0001 |

[a]QOL = quality of life; PHQ-9 = Patient Health Questionnaire-9.

[b]Values are presented as mean ± SD and as No. (percentage).

[c]Those with 3-mo follow-up (n=92) were similar to the 8 without a 3-mo survey with respect to baseline characteristics with the exception of education: those with complete follow-up had slightly higher education levels: high school only (2% vs 25%), college or university (59.8% vs 50%), and graduate school or beyond (38% vs 25%) (*P*=.02). Also, slight evidence that those with complete follow-up had higher depression scores (mean PHQ-9, 4.8 vs 2.6; *P*=.053). Results in general are nearly identical among the 92 with complete follow-up (ie, subsetting all analyses discussed above to the n=92 set).

[d]All pairwise *P* values from linear or logistic regression models using generalized estimating equations to account for repeated data. The overall effect of time was highly significant at the .0001 level for each score, except for the mental stress management or relaxation techniques (*P*=.002). No significant differences between times 2 and 3 were noted (all *P* values >.05).

[e]*P* values after combining "mild" and "moderate to severe" depressive symptom levels.

24 weeks, these models focused on the effects from baseline to 12 weeks only. After adjusting for these characteristics, the effect of time on each of these scores from baseline to 12 weeks changed very little.

## DISCUSSION

In this single-arm cohort study of 100 participants who completed a 12-week in-person wellness coaching program, individuals reported significant improvements (*P*<.0001) in 3 areas of psychosocial functioning: QOL, depressive symptoms, and perceived stress level. Health behavior changes often have a high relapse rate, and participants in this project maintained these improvements at the 24-week follow-up. These findings support the growing level 2 evidence for behavioral health benefits associated with participating in wellness coaching. It is promising that participants experienced improvement in all 3 areas, that the effect size was clinically meaningful, and that these improvements were maintained over time. Given the participants' maintenance of behavioral health improvements, it is plausible that the wellness coaching participants learned skills they successfully used over time to improve their QOL, reduce their symptoms of depression, and manage their perceived stress level. Although these findings add to the growing literature supporting wellness coaching, this single-cohort study that lacked a control group cannot determine causality and provides only level 2 evidence. Therefore, randomized controlled trials are needed to further examine and establish the potential benefits of wellness coaching.

Quality of life is an important aspect of wellness and incorporates both physical and mental domains of functioning. Quality of life is associated with health status and health behaviors.[18] Quality of life consists of overall QOL and 5 domains: mental well-being, physical well-being, emotional well-being, social activity, and spiritual well-being.[11] The improvements in QOL in this study are notable because participants experienced statistically significant (*P*<.0001) improvements in overall QOL and in all 5 domains. The effect sizes were moderate to large, which is reflective of clinically meaningful changes. These results can provide effect size estimates for future randomized controlled trials.


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Depression is associated with poor health status, nonadherence to health care recommendations, and negative health behaviors. Although individuals should seek care for depression from their primary health care professional or licensed mental health care professional, it is possible that many individuals who enter wellness coaching will be experiencing symptoms of depression. In this study, participants significantly ($P<.0001$) reduced their level of depressive symptoms after the 12 sessions of wellness coaching and maintained improved mood at the 24-week follow-up. From a clinical perspective, it is interesting to note that at baseline, the mean score on the PHQ-9 was in the mild depressive symptom range; and at the post—wellness coaching assessments and the 24-week follow-up time point, the mean score was in the minimal depressive symptom range. The percentage of participants in the moderate to severe range decreased from 12% to 1%, and the percentage of participants in the mild range decreased from 32% to 11% over the course of wellness coaching. Our clinical model is that individuals should first seek depression care through their primary health care professional or licensed mental health care professional and then additionally focus on self-care strategies such as physical activity, healthy sleep, spirituality, and social activities with a wellness specialist. However, if future randomized controlled studies can find an effect of wellness coaching on mood management, perhaps wellness coaching can play a role in an integrated multidisciplinary approach to long-term depression management.

Stress is a prevalent and important problem in our society and at the workplace.[18] Effective strategies for stress reduction are needed in the workplace to help reduce health care costs, to address presenteeism, and to improve functioning. It should be noted that at baseline the participants were below the national mean score on the perceived stress level. However, despite this low baseline level of perceived stress, wellness coaching participants exhibited a statistically significant reduction in their perceived stress level; and they maintained this improvement at the 24-week follow-up. This effect size was moderate to large and is therefore suggestive of a clinically meaningful improvement. If confirmed by other investigators in large randomized controlled trials of employees with high baseline perceived stress levels, in addition to referral to a formal stress reduction or mindfulness-based group program, employees with a high stress level may benefit from participating in wellness coaching.

The medical record information was examined to provide a rough estimate of the health status of the wellness coaching participants. In designing future randomized clinical trials, it will be important to know the potential health problems that wellness coaching participants may be experiencing so that wellness coaches can guide the participants toward safe methods of physical activity and nutritional improvements. Our study team did not anticipate or hypothesize that wellness coaching would have a significant effect on health status at week 12 or 24, and so medical records were examined only at baseline to provide guidance for health issues that future investigators may want to consider in designing and tailoring wellness coaching programs. It will require ongoing improvements in health behaviors over many months or years for employees to report health status improvements, such as reductions in blood pressure readings or number of medications prescribed. Participants were members of a wellness center, and so it was somewhat surprising that the participants in this study did have a high level of health problems. Almost a fifth had obstructive sleep apnea, almost a fifth had hypertension, 1 in 20 had cardiovascular problems, 1 in 20 had type 2 diabetes, the mean number of medications was 3, and most had 7 or more health care visits over the past 3 years. These health status demographic characteristics indicate that high-risk employees, those with numerous health problems and high health care costs, were participating in the wellness coaching program. In addition, given the complexity of the participants' health status, how wellness coaching programs should be tailored for specific health populations, such as for people with a diagnosis of type 2 diabetes or high blood pressure, warrants investigation.

This study has several important limitations. Foremost, this was a single-arm study; and, therefore, without a control group, it is possible that the findings are due to other factors, such as natural improvements in psychosocial functioning over time, experimental effects such as the Hawthorn effect, or placebo effects because

there was no contact control condition. Causality statements cannot be made regarding the findings. Other limitations include that the sample was composed of employed individuals, who were primarily female and white participants. How these findings apply to more diverse or underserved populations is unknown. A direct measurement of health behaviors (such as activity level, diet, and adherence to medications) was not evaluated, and this would have strengthened the findings. All employees agreed to participate in 12 sessions of in-person wellness coaching, and so the effects of different lengths of wellness coaching (6 sessions vs 12 sessions) or delivery modality of wellness coaching (telephonic vs in-person) cannot be examined.

## CONCLUSION

In this single-arm cohort study, participants who completed a 12-session in-person wellness coaching program reported significant improvements in their QOL, depressive symptoms, and perceived stress level. These findings provide level 2 evidence for wellness coaching; however, further investigation of wellness coaching using large randomized controlled trials with diverse populations that include a direct measurement of health behaviors is warranted to potentially establish level 1 evidence for wellness coaching.

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**Abbreviations and Acronyms:** **BMI** = body mass index; **PHQ-9** = Patient Health Questionnaire-9; **QOL** = quality of life

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