

Whole Health Action Management: A Randomized Controlled Trial of a Peer-Led Health Promotion Intervention

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Objective: Adults with serious mental illness have high rates of general medical comorbidity and encounter challenges in dealing with multiple health conditions. Chronic illness self-management programs may help them more effectively cope with comorbid illnesses, especially when instructors are certified peer specialists. This study assessed the longitudinal effectiveness of a peer-delivered health promotion program.

Methods: Community mental health program clients in Georgia and Illinois with serious mental illness and health impairments were randomly assigned to receive either Whole Health Action Management (WHAM), a medical illness self-management program led by peer specialists, or care as usual, resulting in a sample of N=139 (WHAM N=68, control N=71). Assessments were conducted at study baseline and at 3 and 6 months. Generalized estimating equations were used to examine change over time in the primary outcome of patient activation and secondary outcomes of general health, hope, and employment.

Results: Longitudinal analysis indicated that compared with control participants, WHAM participants demonstrated significantly greater improvement over time in patient activation for health care. Intervention participants also demonstrated greater improvement in their self-assessed general health, overall hopefulness, and paid employment. Reactions to the WHAM program were positive, with 97% reporting being very or somewhat satisfied, and almost two-thirds (63%) reporting that their health was better than before they joined the program.

Conclusions: The WHAM program improved patient activation, perceived general medical health, hopefulness, and likelihood of paid employment among people with serious mental illness and co-occurring medical conditions. Results suggest that peer-delivered health self-management education is effective and well received by participants.

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The high rate of comorbid general medical conditions among people with serious mental illness accounts for a large proportion of the excess mortality experienced by this group (1–4). Illness self-management programs seek to increase individuals' ability to cope with chronic medical conditions by giving them the practical knowledge and problem-solving skills they need to better manage troublesome symptoms, maintain higher levels of health and functioning, and enhance their emotional well-being (5, 6). A recent systematic review of 58 randomized controlled trials (RCTs) evaluating self-management support interventions delivered by health care providers found that they are effective in improving outcomes in the following areas: disease-specific clinical indicators; health-related quality of life; physical, psychological, or social functioning; patient self-efficacy; health management behaviors; and disease knowledge. (7).

HIGHLIGHTS

- Peer-led health promotion programs are a promising approach to help adults with serious mental illness better manage their chronic health conditions.
- Whole Health Action Management (WHAM) is a peer-led self-management program delivered in weekly group sessions followed by individual meetings.
- WHAM participants experienced improvement in patient activation, self-perceived health, hopefulness, and employment status, compared with individuals in the study's control condition.
- WHAM participants expressed high satisfaction with the program, and most rated their general medical health as better than it was before the program.

Illness self-management programs delivered in group settings offer the additional advantage of social support from classmates, given evidence that social support plays a significant role in successful health behavior change (8, 9). Moreover, use of peer instructors in illness self-management education may enhance its efficacy, because peer-delivered support and education have been shown to promote behavior change in a number of chronic illnesses, including diabetes, arthritis, HIV, and spinal cord injury (10–13). Peers who are successfully managing similar health challenges may provide others with an incentive to develop their own self-management skills and a greater sense of optimism (14–16). This may be especially true for people with serious mental illness who deal with disease chronicity, the effects of stigma, and the organizational separation of mental and general medical care (17, 18).

A small number of randomized studies have shown the effectiveness of illness self-management programs for people with serious mental illness (19). Druss and colleagues (20, 21) conducted two RCTs of the Health and Recovery Peer Program (HARP), which was taught by two peer instructors in six 2.5-hour sessions. Both studies found that HARP participants experienced significantly greater increases in patient activation and visits to primary care providers, compared with control group members. Another intervention called Living Well was taught by peer and nonpeer dyads over six 75-minute sessions and tested in two RCTs. One study found significant improvement in outcomes such as health-related locus of control and healthy eating and physical activity (22), and the other study found improved illness management self-efficacy and increased behavioral and cognitive symptom management (23).

Peer-led chronic illness self-management programs may hold significant promise for helping people with serious mental illness better manage their general medical conditions. This study presents the results of a multisite RCT of a peer-developed and peer-delivered program called Whole Health Action Management (WHAM) that is designed to increase the skills, knowledge, and confidence needed for the self-management of general medical health and illness. We hypothesized that compared with persons in the control group, WHAM participants would experience greater increases in patient activation (primary outcome), along with greater improvement in self-rated health. Given prior research showing that mental health peer support leads to increased hope for the future (24), we hypothesized that WHAM participants would experience greater increases in hopefulness. Finally, because of prior research showing that health promotion interventions improve work performance and reduce absenteeism (25), we hypothesized that WHAM participants would have higher rates of paid employment.

METHODS

Study Procedures

Study participants were recruited at community mental health agencies in Georgia (one site) and Illinois (two sites)

by local research staff who were hired and trained by university investigators. Seven waves of recruitment for seven WHAM classes commenced in October 2013 and ended in September 2016. Written informed consent was obtained by using human subjects procedures approved by the institutional review board of the University of Illinois at Chicago (UIC). Random assignment was performed by UIC Survey Research Laboratory interviewers at the end of the baseline interviews by using a randomly generated allocation sequence that was programmed into computer-assisted interviewing software. This method permitted complete allocation concealment up to the point of assignment (26) so that interviewers and respondents had no way of knowing each participant's study condition until after assignment had occurred. Information regarding participant characteristics and outcomes was obtained during telephone interviews at baseline and at 3 and 6 months postbaseline by interviewers blinded to study condition.

Inclusion and Exclusion Criteria

Participants met the following inclusion criteria: age 18–65 years, diagnosis of serious mental illness, enrolled in a community mental health program that was participating in the study, presence of a medical condition or health impairment the participant wanted to address, and ability to provide informed consent. Exclusion criteria included intention to move away from the local area in the next 3 months and previous receipt of peer-led illness self-management education.

Study Enrollment and Retention

A total of 161 individuals consented to participate in the study after induction sessions. Of these, 146 had a baseline interview and were randomly assigned to the experimental (N=73) or control (N=73) condition. Of the 15 individuals who consented but were not randomly assigned, 12 did not respond to attempts to schedule the baseline interview, two refused the baseline interview, and one was not locatable. (A CONSORT diagram is included in an online supplement to this article). Of the 146 participants who had a baseline interview, 139 (95%) had a follow-up postintervention interview, and this proportion did not differ significantly by study condition (intervention, 93%, N=68 of 73; control group, 97%, N=71 of 73).

Intervention

WHAM participants met once a week in a group that was co-led by two certified peer specialists and once a week in an individual session with one of the peer instructors. The first three group sessions lasted 2.5 hours each, during which group members learned about whole health; how to develop a wellness goal (e.g., be more physically active, feel more rested, and develop healthy food and beverage habits); and how to formulate weekly action plans that were meaningful, specific, attainable, and measurable (e.g., walk three times a week for 30 minutes, go to bed at 10 p.m. at least five nights a

week, and drink 60 ounces of water 4 days per week). They also rated their confidence in being able to follow their action plans on a scale from a low of 1 to a high of 10.

Group sessions 4 to 11 lasted for 90 minutes each, with participants reporting on whether they accomplished the prior week's action plan and then stating the action plan for the coming week and rating their confidence level. These sessions also covered health and recovery topics, including understanding the power of peer support, communicating effectively with health providers, taking care of oneself, identifying and managing high blood pressure, identifying and managing diabetes, identifying and managing high cholesterol, taking stock, and recognizing signs of mental health recovery. Session 12 included a graduation celebration. In all 12 sessions, participants learned and practiced the relaxation response (27) for dealing with internal and external stress by calming one's body and mind through meditation, controlled breathing, and muscle tightening and release.

WHAM also involved weekly individual meetings with a peer specialist. The first three meetings lasted for 45 minutes each and involved reviewing and personalizing WHAM goal setting and weekly action planning activities. The remaining individual sessions lasted 15 minutes each and included discussion and reinforcement of health and recovery topics, as well as health check-ins that involved identifying problems requiring medical assistance, supporting participants in scheduling medical appointments, preparing participants for upcoming medical visits, and assisting participants in engaging in recommended treatment and follow-up care. Eleven individual sessions were held on the same weeks as the group sessions, with the exception of the 12th "graduation" group session.

Intervention Fidelity

Fidelity was monitored in two ways throughout the entire period of service delivery. The first used a checklist that was completed via telephone by a researcher with one of the teachers within 48 hours of every session. This checklist was designed to track adherence to each session's prescribed topics, time frames, and instructional modalities. Each curriculum component was scored 1 if the prescribed element occurred and 0 otherwise. Fidelity scores were computed as the proportion of prescribed elements present for that session.

The second method of fidelity assessment involved audiotaping all group and individual sessions and having researchers review the first three sessions, followed by auditing a 33% random selection ($N=3$) of the remaining nine group and individual sessions. While listening to the audio files, researchers completed the checklist for that session and then compared these scores with those reported by the teachers, noting any discrepancies. The results of both types of fidelity assessments were reviewed weekly with teachers, and refresher training was used if lapses in fidelity were observed.

Intervention Attendance

Instructors maintained attendance logs for each participant, coded 1 if the person was present (either in person or by

individual makeup session) and 0 otherwise. Total attendance was computed by summing group, individual, and combined attendance scores for each participant.

Measures

The primary outcome was improved general medical self-management, which was assessed with the short-form Patient Activation Measure (28). This 13-item scale assesses illness self-management skills, knowledge, and confidence, including the degree to which respondents proactively maintain and improve their health, endorse the importance of health management, are confident in their ability to act, and maintain healthy behaviors even during times of stress. Scores are used to calculate four levels of patient activation: level 1, passive recipients of care who are disengaged and overwhelmed; level 2, those who lack confidence and knowledge needed for health management; level 3, those who are beginning to self-manage and regain control of their health; and level 4, those who are proactive about their health (29, 30). Level of activation has been shown to predict better medical outcomes, lower use of emergency and inpatient services, and better treatment adherence (31).

A secondary outcome was general health over the past month, which was measured with the World Health Organization Disability Assessment Scale single-item health self-rating. Respondents were asked, "How do you rate your overall health in the past 30 days?" Five responses ranged from a high of very good to a low of very bad (32). This scale is a robust predictor of mortality and correlates strongly with other objective health indicators (33).

Another secondary outcome was hopefulness, assessed with the Hope Scale (34). This 12-item measure conceptualizes hope as a positive motivational state comprising respondents' belief in their capacity to initiate and sustain actions that lead to attaining goals (agency) and to generate routes by which goals may be reached (pathways). Items are rated on a 4-point response scale, ranging from definitely false to definitely true, to produce a total score and two subscale scores. Research has found that higher scores on measures of hope are significantly associated with better outcomes in general medical health, psychological adjustment, psychotherapy, and academic performance (35).

Finally, because of the strong association between health and work status (36), as well as prior evidence that health promotion programs improve work outcomes (25), we assessed the rehabilitation outcome of paid employment. We used the U.S. Department of Labor definition of an employed person, measured as any work at all for pay or profit or at least 15 hours of unpaid work in a family-operated enterprise during a reference period (37)—in this case the past 90 days.

Participant satisfaction was assessed with a ten-item scale specifically developed for this study, which asked about intervention features, such as setting achievable health goals, receiving support from peers, learning about whole health, and developing relationships with WHAM teachers.

Statistical Analysis

To assess the success of randomization, we examined differences in participant baseline characteristics by study condition by using chi-square and *t* tests. We analyzed outcome data using generalized estimating equations for ordinal (patient activation and self-rated health), linear (hopefulness), and dichotomous (employment status) outcomes. Each model included intercept, study condition, time (baseline, 3 months, and 6 months), and study condition \times time interactions. Because our preliminary analysis found that less than 1% of the variance in study outcomes was attributable to clustering within course waves, there was no need to include wave in the model as a random effect. No additional covariates were included in the models, given the statistical equivalence of study conditions on baseline characteristics (described below). Data were analyzed in SAS, version 9.4, and SPSS, version 25.

RESULTS

Intervention Fidelity

Analysis of fidelity checklist data found no significant differences in fidelity by study site, wave, or course session. Intervention fidelity across the three mental health program sites ranged from 98.4% to 99.8%. Fidelity across the seven waves of intervention delivery ranged from a low of 97.8% to a high of 100%. Fidelity by course session number ranged from 97.0% to 100%. Overall, program fidelity across the community mental health program sites, course sessions, and waves of intervention delivery was 99.2%.

Intervention Attendance

On average, participants attended at least ten of 12 group classes (mean \pm SD = 10.9 \pm 2.9), at least nine of 11 individual sessions (9.8 \pm 2.8), and 20 of the 23 combined group and individual sessions (20.6 \pm 5.7). There were no significant differences in group, individual, or combined attendance by wave or by site.

Participant Characteristics and Equivalence of Study Conditions

Table 1 presents participants' baseline characteristics by study condition and in total. No significant differences were found between the two groups on measured variables. Participants were recruited from three sites: 28% (N=39 of 139) at each of the two sites that delivered two waves of classes and 44% (N=61 of 139) at the site that delivered three waves.

Services as Usual

From a list of 20 services with accompanying service definitions, study participants were asked to report which they had received in the past 3 months. A total of 137 participants responded to this question at 3 months and 130 at 6 months. Overall use of services was high, with 97% (N=133) reporting use of one or more service between baseline and 3 months and 97% (N=126) reporting use of one or more between 3 and 6 months (not shown). The most frequently reported services between baseline and 3 months were as follows: case

management, 86% (N=118); medication management, 82% (N=112); psychotherapy, 79% (N=108); recovery center services, 65% (N=89); and assistance with public benefits, 65% (N=89). No significant differences by study condition were reported in service use for the periods between baseline and 3 months or between 3 and 6 months.

Participant Outcomes

A table presenting outcome means and SDs by study condition at each time point is included in the online supplement. Regarding the primary outcome of patient activation, at baseline, 17% (N=23 of 139) scored at the lowest level of activation (level 1), 13% (N=18) at level 2, 45% (N=63) at level 3, and 25% (N=35) at level 4. By the 3- or 6-month follow-up point, 34% of the total group (N=47) increased their scores by one or more levels; a higher proportion of WHAM participants than control group members demonstrated this increase (WHAM, 44%, N=30 of 68; control, 24%, N=17 of 71; $\chi^2=6.32$, N=139, df=1, *p*=0.012). To assess improvement, those with baseline scores at level 4 were removed from further analysis, following the developers' recommendation (29) and consensus standards endorsed by the National Quality Forum (38) and consistent with other change studies that removed high scorers (39–41). Analysis of the other three outcomes included data from all study participants.

Table 2 presents the results of generalized estimating equation linear, ordinal, and logistic models examining study outcomes. For patient activation, the statistically significant intervention \times time interaction indicated that WHAM participants showed greater improvement in health activation over time, compared with control group participants. Turning next to general medical health, those assigned to WHAM rated their general medical health significantly higher over time, compared with those in the control group. WHAM participants also showed significant improvement in total Hope Scale scores, compared with control participants. Regarding the two Hope Scale subscales, WHAM participants showed significantly greater improvement than those in the control group in their belief that they could generate routes to goal attainment (pathways). However, no significant differences were found by study condition in respondents' belief in their ability to initiate and sustain actions leading to goal attainment (agency). Finally, compared with the control group, the intervention group was significantly more likely to be employed over time. Across the follow-up points, 19% (N=13 of 68) of WHAM participants reported gainful employment, compared with 7% (N=5 of 71) of control group participants. Among intervention participants, 6% (N=4 of 68) were employed at baseline, 19% (N=13 of 68) at 3 months, and 19% (N=12 of 64) at 6 months. Among control group participants, 10% were employed at baseline (N=7 of 71), 7% (N=5 of 69) at 3 months, and 6% (N=4 of 66) at 6 months.

Participant Satisfaction

A total of 67 WHAM participants responded to the satisfaction survey. Most (78%, N=52) reported being very satisfied overall with the WHAM program, 19% (N=13) were

somewhat satisfied, and 3% (N=2) were somewhat dissatisfied. Almost two-thirds (63%, N=42) rated their health as better than when they started the program, 33% (N=22) rated it as about the same, and 5% (N=3) rated it as worse. Satisfaction with specific features of the intervention included learning new things about whole health (liked a lot, 85%, N=57; liked a little, 12%, N=8), setting a simple health goal (liked a lot, 76%, N=51; liked a little, 21%, N=14), and receiving peer support (liked a lot, 78%, N=52; liked a little, 15%, N=10).

DISCUSSION

In this RCT, compared with control group members who received services as usual, WHAM participants experienced significantly greater improvement in the primary outcome of general medical self-management. They endorsed the importance of taking responsibility for their own health, proactively monitoring their physical status, and maintaining healthy behaviors even during stressful times. Compared with control group members, intervention participants also had significantly greater increases in the secondary outcome of self-rated general medical health. Moreover, when WHAM participants were queried about changes in their health, most reported that it had improved since joining the program. This confirms WHAM's positive effects on enhancing health management and on improving the perceptions of people with serious mental illness about their overall health.

WHAM participants also improved significantly more than control group members on the secondary outcome of hope, measured as a person's perceived ability to derive pathways to desired goals and to use those pathways successfully for goal attainment. Because a large part of the curriculum involves helping participants identify a health goal and develop and follow weekly plans to reach that goal, this finding supports another of WHAM's major aims. At the same time, it is interesting that there was no difference by study condition on the Hope Scale subscale measuring agency. Thus, although our results confirm WHAM's

positive impact on participants' perceived ability to plan for better health, WHAM did not enhance participants' perceptions that they could follow these plans to successful goal attainment, at least as measured by this scale. This finding may be a result of the well-documented social determinants of health (42) faced by people with serious mental illness, such as poverty, unstable housing, low health literacy, and barriers to accessing health care. These forces may be less amenable to change by interventions with active ingredients of planning and peer support and may require more intensive and costly structural remedies, delivered over longer periods.

The fourth outcome affected by WHAM participation was employment. This is not surprising given considerable research evidence that good health and paid work are strongly associated with one another (36). In our study, the proportion of WHAM participants working for pay was more than twice as high as the proportion in the control group. At the same time, this proportion was modest, at 19%, and may have been partly attributable to the use of

TABLE 1. Baseline characteristics of study participants (N=139), by study condition

Characteristic	Total (N=139)		Intervention (N=68)		Control (N=71)		χ^2	df	p
	N	% ^a	N	% ^a	N	% ^a			
Race							5.62	3	.13
Black/African American	91	66	44	65	47	66			
White	43	31	19	28	24	34			
Native American	2	1	2	3	0	0			
Asian	3	2	3	4	0	0			
Latinx	7	5	5	7	2	3	1.49	1	.22
Female	63	45	35	52	28	39	2.03	1	.15
High school or GED	113	81	53	78	60	85	.99	1	.32
Married or living with partner	12	9	9	13	3	4	3.68	1	.06
Living in own house or apartment	85	61	38	56	47	66	1.56	1	.21
Parent	54	39	26	38	28	39	.21	1	.89
Employed	11	8	4	6	7	10	.75	1	.38
Annual income <\$10,000	69	53	34	53	35	53	.00	1	.99
Diagnosis category							1.28	3	.74
Schizophrenia spectrum	63	45	33	49	30	42			
Bipolar disorder I or II	44	32	22	32	22	31			
Major depressive disorder	23	17	9	13	14	20			
Other	9	7	4	6	5	7			
Ever treated overnight for a mental health condition	117	84	57	84	60	85	.12	1	.91
Ever treated for substance use	51	37	21	31	30	42	1.93	1	.16
Public health insurance (Medicaid or Medicare)	124	89	60	88	64	90	.13	1	.72
Study site									
1	39	28	19	28	20	28	.21	2	.90
2	61	44	31	46	30	42			
3	39	28	18	27	21	30			
	M±SD		M±SD		M±SD		t	df	p
Age at baseline	51±10		50±10		52±9		.96	137	.34
Household size (including participant)	1.3±1.2		1.3±1.0		1.4±1.4		.38	133	.71

^a Percentages may not sum to 100 because of rounding.

TABLE 2. Effect of intervention versus control condition over time, by outcome (N=139)

Outcome	OR or estimate	95% CI or SE	p
Patient activation level (reference: lowest level) ^a			
Intercept	2.48	0.10	<.001
Intervention	.82	.44–1.53	.52
Time	.99	.92–1.06	.80
Intervention × time	1.12	1.01–1.24	.04
Self-rated health (reference: lowest level) ^a			
Intercept	3.69	0.12	<.001
Intervention	.64	.36–1.15	.14
Time	1.00	.95–1.05	.99
Intervention × time	1.10	1.01–1.19	.03
Hope Scale ^b			
Total score			
Intercept	32.81	.70	<.001
Intervention	-.07	.98	.94
Time	.05	.07	.48
Intervention × time	.20	.10	.04
Pathways subscale			
Intercept	11.88	.26	<.001
Intervention	.02	.36	.95
Time	-.03	.03	.29
Intervention × time	.11	.04	.01
Agency subscale			
Intercept	11.56	.29	<.001
Intervention	.27	.40	.50
Time	.04	.03	.12
Intervention × time	.02	.05	.57
Employed (reference: not employed) ^c			
Intercept	-2.25	0.39	<.001
Intervention	.85	.30–2.42	.76
Time	.95	.90–1.00	.07
Intervention × time	1.21	1.08–1.36	.001

^a Generalized estimating equation ordinal logistic model.^b Generalized estimating equation linear model.^c Generalized estimating equation binary logistic model.

employment services by one-third of WHAM participants (38%, N=26 of 68). This finding suggests that combining peer-led health-management education with evidence-based supported employment services may provide simultaneous health and vocational improvement in a synergistic manner (43). The recent trend toward including peer providers in evidence-based supported employment services, such as the individual placement and support model (44, 45), offers one such avenue for the blending of services aimed at both health and career recovery.

This study had a number of limitations. First, study participants were not drawn from a national probability sample of people with serious mental illness, which limits the generalizability of our results. Second, although randomization resulted in study conditions that were equivalent on demographic and other baseline measures, additional factors that we did not measure may have influenced participant outcomes. Third, we did not assess the longer-term effects of the intervention, which is a direction for future research. In

particular, our finding regarding employment would benefit from replication over a longer follow-up period. A fourth limitation was the use of a services-as-usual control condition; a more robust test of the intervention would have used an active control condition. Fifth, our study's design did not allow us to test for any differential effects of the group versus individual sessions, which is another topic for future research. Finally, many of the study's outcomes were measured by self-report and were thus subject to potential biases and distortions due to factors such as poor memory or social desirability.

CONCLUSIONS

Peer-led chronic illness self-management programs appear to hold significant promise for helping people with serious mental illness achieve lasting health behavior change. Our study's findings contribute to a growing evidence base confirming the effectiveness of this approach (19–23). Since 2012, more than 3,000 people in 30 states have received training in the delivery of WHAM in partnership with community behavioral health centers, federally qualified health centers, health homes, correctional facilities, and Department of Veterans Affairs programs (46, 47). WHAM facilitators are linked to a national listserv to foster ongoing peer support, share tips and tools for success, and provide new resources for peer services and integrated health. In June 2012, the Centers for Medicare and Medicaid Services approved Georgia as the first state to have Medicaid-recognized WHAM services provided by the state's certified peer specialists (48). As a part of this Medicaid design, peer specialists in Georgia can elect to receive specialized training to provide WHAM as part of their recovery services. Since implementation, approximately 400 Georgia peer specialists have added WHAM certification to their professional credentials.

The funding of peer specialist services using Medicaid dollars is a growing phenomenon in the United States. As of 2018, a total of 32 states included behavioral health peer specialist services in their fee-for-service programs for categorically needy recipients of traditional Medicaid who are age 21 and older (49). With widespread training in the delivery of WHAM, the stage is set for development of a peer workforce capable of delivering effective illness self-management education funded by state and federal dollars as part of a comprehensive array of community mental health services. Therefore, future research should address both the costs and the cost-effectiveness of WHAM, including costs associated with training, delivery, and wide-scale implementation.

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REFERENCES

1. Cook JA, Razzano LA, Swarbrick MA, et al: Health risks and changes in self-efficacy following community health screening of adults with serious mental illnesses. *PLoS One* 2015; 10:e0123552
2. Bahorik AL, Satre DD, Kline-Simon AH, et al: Serious mental illness and medical comorbidities: findings from an integrated health care system. *J Psychosom Res* 2017; 100:35–45
3. Druss BG, Chwastiak L, Kern J, et al: Psychiatry's role in improving the physical health of patients with serious mental illness: a report from the American Psychiatric Association. *Psychiatr Serv* 2018; 69:254–256
4. Walker ER, McGee RE, Druss BG: Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. *JAMA Psychiatry* 2015; 72:334–341
5. Lorig KR, Ritter P, Stewart AL, et al: Chronic Disease Self-Management Program: 2-year health status and health care utilization outcomes. *Med Care* 2001; 39:1217–1223
6. Brady TJ, Murphy L, O'Colmain BJ, et al: A meta-analysis of health status, health behaviors, and health care utilization outcomes of the Chronic Disease Self-Management Program. *Prev Chronic Dis* 2013; 10:120112
7. Dineen-Griffin S, Garcia-Cardenas V, Williams K, et al: Helping patients help themselves: a systematic review of self-management support strategies in primary health care practice. *PLoS One* 2019; 14:e0220116
8. Vassilev I, Rogers A, Kennedy A, et al: The influence of social networks on self-management support: a metasynthesis. *BMC Public Health* 2014; 14:719
9. Gallant MP: The influence of social support on chronic illness self-management: a review and directions for research. *Health Educ Behav* 2003; 30:170–195
10. Tang TS, Funnell M, Sinco B, et al: Comparative effectiveness of peer leaders and community health workers in diabetes self-management support: results of a randomized controlled trial. *Diabetes Care* 2014; 37:1525–1534
11. Boucher LM, Liddy C, Mihan A, et al: Peer-led self-management interventions and adherence to antiretroviral therapy among people living with HIV: a systematic review. *AIDS Behav* 2019; 24: 998–1022
12. Crotty M, Prendergast J, Battersby MW, et al: Self-management and peer support among people with arthritis on a hospital joint replacement waiting list: a randomised controlled trial. *Osteoarthritis Cartilage* 2009; 17:1428–1433
13. Houlihan BV, Brody M, Everhart-Skeels S, et al: Randomized trial of a peer-led, telephone-based empowerment intervention for persons with chronic spinal cord injury improves health self-management. *Arch Phys Med Rehabil* 2017; 98:1067–1076.e1
14. Fisher EB, Ballesteros J, Bhushan N, et al: Key features of peer support in chronic disease prevention and management. *Health Aff* 2015; 34:1523–1530
15. Heisler M: Overview of peer support models to improve diabetes self-management and clinical outcomes. *Diabetes Spectr* 2007; 20: 214–221
16. Embuldeniya G, Veinot P, Bell E, et al: The experience and impact of chronic disease peer support interventions: a qualitative synthesis. *Patient Educ Couns* 2013; 92:3–12
17. Sterling EW, von Esenwein SA, Tucker S, et al: Integrating wellness, recovery, and self-management for mental health consumers. *Community Ment Health J* 2010; 46:130–138
18. Swarbrick MA: Wellness-oriented peer approaches: a key ingredient for integrated care. *Psychiatr Serv* 2013; 64: 723–726
19. Lawn S, Battersby MW, Pols RG, et al: The mental health expert patient: findings from a pilot study of a generic chronic condition self-management programme for people with mental illness. *Int J Soc Psychiatry* 2007; 53:63–74
20. Druss BG, Zhao L, von Esenwein SA, et al: The Health and Recovery Peer (HARP) Program: a peer-led intervention to improve medical self-management for persons with serious mental illness. *Schizophr Res* 2010; 118:264–270
21. Druss BG, Singh M, von Esenwein SA, et al: Peer-led self-management of general medical conditions for patients with serious mental illnesses: a randomized trial. *Psychiatr Serv* 2018; 69: 529–535
22. Goldberg RW, Dickerson F, Lucksted A, et al: Living Well: an intervention to improve self-management of medical illness for individuals with serious mental illness. *Psychiatr Serv* 2013; 64: 51–57
23. Muralidharan A, Brown CH, E Peer J, et al: Living Well: an intervention to improve medical illness self-management among individuals with serious mental illness. *Psychiatr Serv* 2019; 70: 19–25
24. Schrank B, Bird V, Rudnick A, et al: Determinants, self-management strategies and interventions for hope in people with mental disorders: systematic search and narrative review. *Soc Sci Med* 2012; 74:554–564
25. Mills PR, Kessler RC, Cooper J, et al: Impact of a health promotion program on employee health risks and work productivity. *Am J Health Promot* 2007; 22:45–53
26. Gluud LL: Bias in clinical intervention research. *Am J Epidemiol* 2006; 163:493–501
27. Benson H, Klipper MZ: *The Relaxation Response*. New York, Morrow, 1975
28. Hibbard JH, Mahoney ER, Stockard J, et al: Development and testing of a short form of the Patient Activation Measure. *Health Serv Res* 2005; 40(suppl 6 pt1):1918–1930
29. Zill JM, Dwinger S, Kriston L, et al: Psychometric evaluation of the German version of the Patient Activation Measure (PAM13). *BMC Public Health* 2013; 13:1027
30. Greene J, Hibbard JH, Sacks R, et al: When patient activation levels change, health outcomes and costs change, too. *Health Aff* 2015; 34:431–437
31. Greene J, Hibbard JH: Why does patient activation matter? An examination of the relationships between patient activation and health-related outcomes. *J Gen Intern Med* 2012; 27: 520–526
32. Sousa RM, Dewey ME, Acosta D, et al: Measuring disability across cultures—the psychometric properties of the WHODAS II in older people from seven low- and middle-income countries: the 10/66 Dementia Research Group population-based survey. *Int J Methods Psychiatr Res* 2010; 19:1–17
33. Subramanian SV, Huijts T, Avendano M: Self-reported health assessments in the 2002 World Health Survey: how do they correlate with education? *Bull World Health Organ* 2010; 88:131–138

34. Snyder CR, Sympton SC, Ybasco FC, et al: Development and validation of the State Hope Scale. *J Pers Soc Psychol* 1996; 70:321–335
35. Snyder CR: Hope theory: rainbows in the mind. *Psychol Inq* 2002; 13:249–275
36. Hergenrather KC, Zeglin RJ, McGuire-Kuletz M, et al: Employment as a social determinant of health: a systematic review of longitudinal studies exploring the relationship between employment status and physical health. *Rehabil Res Policy Educ* 2015; 29:2
37. Labor Force Statistics From the Current Population Survey. Washington, DC, US Bureau of Labor Statistics, 2019. <https://www.bls.gov/cps/lfcharacteristics.htm#emp>
38. Gains in Patient Activation (PAM) Scores at 12 Months. Washington, DC, National Quality Forum, 2015. <http://www.qualityforum.org/QPS/MeasureDetails.aspx?standardID=2483&print=0&entityTypeID=1>
39. Costello RE, Anand A, Jameson Evans M, et al: Associations between engagement with an online health community and changes in patient activation and health care utilization: longitudinal web-based survey. *J Med Internet Res* 2019; 21:e13477
40. Linden A: Estimating measurement error of the Patient Activation Measure for respondents with partially missing data. *BioMed Res Int* 2015; 2015:270168
41. AuYoung M, Ponce NA, Duru OK, et al: Patient activation is inconsistently associated with positive health behaviors among obese safety net patients. *J Immigr Minor Health* 2016; 18:1489–1497
42. Braveman P, Gottlieb L: The social determinants of health: it's time to consider the causes of the causes. *Public Health Rep* 2014; 129(1 suppl 2):19–31
43. Pinto AD, Hassen N, Craig-Neil A: Employment interventions in health settings: a systematic review and synthesis. *Ann Fam Med* 2018; 16:447–460
44. Kern RS, Zarate R, Glynn SM, et al: A demonstration project involving peers as providers of evidence-based, supported employment services. *Psychiatr Rehabil J* 2013; 36:99–107
45. Balogun-Mwangi O, Rogers ES, Maru M, et al: Vocational peer support: results of a qualitative study. *J Behav Health Serv Res* 2019; 46:450–463
46. WHAM: Whole Health Action Management—Peer Support Training Participant Guide. Rockville, MD, Center for Integrated Health Solutions, 2015
47. Lerner-Wren G: The need for health activism in the criminal justice system. *Huffington Post*, March 30, 2015. https://www.huffpost.com/entry/the-need-for-health-activ_b_6965274
48. Swarbrick M, Tunner TP, Miller DW, et al: Promoting health and wellness through peer-delivered services: three innovative state examples. *Psychiatr Rehabil J* 2016; 39:204–210
49. Medicaid Behavioral Health Services: Peer Support Services. Washington, DC, Kaiser Family Foundation, 2018. <https://www.kff.org/other/state-indicator/medicaid-behavioral-health-services-peer-support-services/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>