Reducing Health Disparities in Persons with Mental Illness by Engaging Patients, Peers Mobile Technology and Implementation Science

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Disclosures

• Grant Funding:
  – NIMH
  – CDC
  – HRSA
  – AHRQ
  – CMS

• Consultant:
  – Substance Abuse and Mental Health Administration
  – National Council of Behavioral Health Care
Overview

• Serious mental illness as a health disparity
• Serious mental illness as a high cost health condition
• The failure of conventional treatment to reduce early mortality and costs
• The challenge of implementation
• The promise and potential of peers and technology
Serious Mental Illness: The Nation’s Greatest Hidden Health Disparity?

THE LANCET Psychiatry

Volume 4, Issue 5, May 2017, Pages 351-352

Comment

Why serious mental illness should be designated a health disparity and the paradox of ethnicity

Stephen J Bartels a✉, Peter DiMilia a
The Epidemic of Premature Death in Middle-aged Persons with Mental Illness

The average life expectancy in the US has steadily increased to 77.9 years (increasing by almost 5 years since the 90s alone).

At the same time………..

Mentally ill die 25 years earlier, on average
By Marilyn Elias, USA TODAY

Adults with serious mental illness treated in public systems die about 25 years earlier than Americans overall, a gap that’s widened since the early ’90s when major mental disorders cut life spans by 10 to 15 years, according to a report due Monday.

For people with major mental illness: The average life expectancy is 53 yrs.
“50 is the New 75”
### The Hidden Health Disparity of Early Mortality for Patients with Major Mental Illness

#### Mean Years of Potential Life Lost

<table>
<thead>
<tr>
<th>Year</th>
<th>AZ</th>
<th>MO</th>
<th>OK</th>
<th>RI</th>
<th>TX</th>
<th>UT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>26.3</td>
<td>25.1</td>
<td></td>
<td></td>
<td>28.5</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>27.3</td>
<td>25.1</td>
<td></td>
<td></td>
<td>28.8</td>
<td>29.3</td>
</tr>
<tr>
<td>1999</td>
<td>32.2</td>
<td>26.8</td>
<td>26.3</td>
<td></td>
<td>29.3</td>
<td>26.9</td>
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<tr>
<td>2000</td>
<td>31.8</td>
<td>27.9</td>
<td></td>
<td>24.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compared with the general population, persons with major mental illness lose 25-30 years of normal life span.

Colton CW, Manderscheid RW. Prev Chronic Dis [serial online] 2006 Apr [date cited]. Available at: URL:http://www.cdc.gov/pcd/issues/2006/apr/05_0180.htm
Cardiovascular Disease Is Primary Cause of Death in Persons with Mental Illness*


Colton CW, Manderscheid RW. Prev Chronic Dis [serial online] 2006 Apr [date cited]. Available at URL: http://www.cdc.gov/pcd/issues/2006/apr/05_0180.htm
• 203 studies including 29 countries over six continents
• mental health disorders 2.22 times higher mortality risk compared to general population or people w/o mental illness.
• average of 10 years of potential life lost
• Medical causes 2/3 (67.3%) of deaths, 17.5% “unnatural causes; remaining unknown.
Cardiovascular Disease (CVD) Risk Factors and Major Mental Illness
A Paradigm for High Complexity and Risk

<table>
<thead>
<tr>
<th>Modifiable Risk Factors</th>
<th>Prevalence Compared to General Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious Mental Illness</td>
<td></td>
</tr>
<tr>
<td>Abdominal Obesity</td>
<td>4.4X</td>
</tr>
<tr>
<td>Smoking</td>
<td>3-4X</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2X</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1.4X</td>
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<tr>
<td>Metabolic Syndrome</td>
<td>2.4X</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>2.7X</td>
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</tbody>
</table>

Vancamfort et al., 2013: Meta-analysis of 136 studies
Factors Contributing to Longevity vs. Premature Death in the General Population

The 2007 National “10 By 10” National Campaign

Aim: To Increase the Life Expectancy of People with Mental Illness by 10 Years in 10 Years

SAMHSA, HRSA, CDC, Healthy People 2020, and Numerous Organizations and Advocacy Groups

A Decade Later there has been no change in life expectancy
**Health Care Costs of Mental Illness**

- Mental illness and substance abuse account for 29% of all hospital days and 22% of hospital costs in the US.
- Direct cost of care for mental illness estimated at $100 billion per year, indirect costs estimated at an *additional* $193 billion.
- Hospitalization and emergency service costs (>25%) account for much of the excess in health care costs for people with SMI.
Co-Morbid Mental Illness also Doubles or Triples Health Care Costs

Medical Costs 2-3 x Greater for Beneficiaries with Co-morbid mental Health or substance Use Disorders = $293 Billion in US

Effective integrated Care estimated to result in savings of 9-16%

Bartels, Clark et al, 2003

Milliman Report, Economic Impact of integrated medical-behavioral health care, 2014
Increasing Life Expectancy and Reducing Costs for People with Serious Mental Illness

1. Integrated Illness Self-Management and Technology

2. Prevention, Health Promotion, Peer Support and Technology
Telehealth and Illness Self-Management
We Know Integrated Self-management Works

Integrated IMR for Psychiatric and General Medical Illness for Adults Aged 50 or Older With Serious Mental Illness

Stephen J. Bartels, M.D., M.S.
Sarah L. Pratt, Ph.D.
Kim T. Mueser, Ph.D.
John A. Naslund, M.P.H.
Rosemarie S. Wolfe, M.S.
Meghan Santos, M.S.W.
Haicy Xie, Ph.D.
Erik G. Riera, Ed.M., M.B.A.

Illness Self-Management Health Coaching for n=71 older adults (mean age 60) with mental disorders and chronic illness (diabetes, COPD, CHF, CVD, hypertension, arthritis)

Self-management support, cognitive behavioral, and motivational skills training
Self-Management Training and Support Outcomes

**Improved Self-management**
- Patient and provider ratings of self-management
  - Knowledge of Symptoms, Meds, Coping
  - Symptom Distress
  - Symptoms Affecting Functioning
- Improved participation in the health care encounter

**Decreased hospitalizations**

<table>
<thead>
<tr>
<th></th>
<th>BL</th>
<th>10mo</th>
<th>14mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalizations</td>
<td>31%</td>
<td>12.10%</td>
<td>17.40%</td>
</tr>
<tr>
<td>(I-IMR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(UC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
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**Graph:**
- Comparison of hospitalizations between I-IMR and UC groups at baseline (BL), 10 months (10mo), and 14 months (14mo).
Pilot 1: Automated Remote Telemedicine Supported Medical Illness Self-Management

Feasibility and Effectiveness of an Automated Telehealth Intervention to Improve Illness Self-Management in People With Serious Psychiatric and Medical Disorders

Sarah I. Pratt and Stephen J. Bartels
Dartmouth College

John A. Naslund, Rosemarie Wolfe, and Heather S. Pixley
Dartmouth College

Kim T. Mueser
Boston University

Louis Josephson
Riverbend Community Mental Health Center,
Concord, New Hampshire

Health Buddy: Electronic unit connected to a phone line provides two-way communication between healthcare providers and patients.

-100 participants age 18+ with SMI plus CHF, COPD, Diabetes, or CAD) enrolled in 12 month RCT cross-over design (HB v. wait list control)
Health Buddy
Automated Daily:
- Self-monitoring
- Health Data Entry
- Self-management
- Education
- Remote Nurse Monitoring
At Baseline: 63% FG>130

After Telehealth
Majority (2/3) in range
FG<120
Service Use Outcomes for People with Diabetes (both $p<.05$)
TeleFriend

• Tablet-based, in-home program
• Users complete daily sessions (5-10 minutes)
• Sessions include medication adherence monitoring, symptom monitoring, education about illness, training on illness self-management and healthy lifestyle behaviors, trivia question or inspirational quote
• Content & monitoring matched to users’ diagnoses
• Responses sent to secure server and reviewed daily on desktop application by Telehealth Specialist
Which Works Best for Implementing Chronic Disease Self-Management in High Risk, Complex Patients?

• Automated Telehealth?
  Or

• Health Coaching and Self-management Training

NIMH Randomized Trial with VinFen (n=300)
Bartels, PI
What About Peers, Mobile Technology And Illness Self-management?
Pilot Study of Integrated Medical and Psychiatric Self-Management mHealth for Adults with SMI

• Psychoeducation
• Coping skills training
• Relapse prevention training
• Behavioral tailoring

Improved Self-management

What About Prevention?
Cardiovascular Disease (CVD) Risk Factors and Major Mental Illness

Vancamfort et al., 2013: Meta-analysis of 136 studies

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The InSHAPE Program
Integrated Health Promotion and Health Behavior Change: In SHAPE

- Nurse Evaluation and Consultation
- Initial Fitness Assessment
  - Individualized fitness and healthy lifestyle assessment
- Individual Meetings with a “Health Mentor”
- Vouchers to Local Fitness Centers
- Individual and group nutrition education
- Smoking cessation referrals
- Group Education/Motivational “Celebrations"

Promoting Health and Functioning in Persons with SMI: CDC - R01 DD000140 (PI: Bartels)
Health Promotion and Fitness for Younger and Older Adults With SMI: R01 MH078052-01 (PI: Bartels)
1st RCT (n=133) :
At 12 months: **49%** in intervention group achieved either clinically significant increased fitness (>50 m on 6MWT) or weight loss (5% or greater)
2nd RCT Boston, Mass
(Multiple Sites: n=210; half underserved minorities)
51% achieved either clinically significant increased fitness
(>50 m on 6MWT) or weight loss (5% or greater)

Pragmatic Replication Trial of Health Promotion Coaching for Obesity in Serious Mental Illness and Maintenance of Outcomes

Stephen J. Bartels, M.D., M.S.
Sarah I. Pratt, Ph.D.
Kelly A. Aschbrenner, Ph.D.
Laura K. Barre, M.D.
John A. Naslund, M.P.H.
Rosemarie Wolfe, M.S.
Haixi Xie, Ph.D.
Gregory J. McGuire, Ph.D.
Daniel E. Jimenez, Ph.D.
Ken Yue, M.S.S.A.
James Feldman, M.D., M.P.H.
Bruce L. Bird, Ph.D.

Objective: Few studies targeting obesity in serious mental illness have reported clinically significant risk reduction, and none have been replicated in community settings or demonstrated sustained outcomes after intervention withdrawal. The authors sought to replicate positive health outcomes demonstrated in a previous randomized effectiveness study of the in SHAPE program across urban community mental health organizations serving an ethnically diverse population.

Method: Persons with serious mental illness and a body mass index (BMI) >25 receiving services in three community mental health organizations were recruited and randomly assigned either to the 12-month In SHAPE program, which included membership in a public fitness club and weekly meetings with a health promotion coach, or to fitness club membership alone. The primary outcome measures were weight and cardiorespiratory fitness (as measured with the 6-minute walk test), assessed at baseline and at 3, 6, 9, 12, and 18 months.

Results: Participants (N=210) were ethnically diverse (46% were nonwhite), with a mean baseline BMI of 36.8 (SD=8.2). At 12 months, the In SHAPE group (N=104) had greater reduction in weight and improved fitness compared with the fitness club membership only group (N=106). Primary outcomes were maintained at 18 months. Approximately half of the In SHAPE group (59% at 12 months and 46% at 18 months) achieved clinically significant cardiovascular risk reduction (a weight loss ≥5% or an increase of >50 meters on the 6-minute walk test).

Conclusions: This is the first replication study confirming the effectiveness of a health coaching intervention in achieving and sustaining clinically significant reductions in cardiovascular risk for overweight and obese persons with serious mental illness.
Weight Loss and Fitness Outcomes

FIGURE 1. Weight Loss in the In SHAPE Intervention Group and the Fitness Club Membership Only Group

FIGURE 2. Change in Fitness as Assessed by the 6-Minute Walk Test in the In SHAPE Group and the Fitness Club Membership Only Group
Research Review of Health Promotion Programs for People with Serious Mental Illness

http://www.integration.samhsa.gov/health-wellness/wellnesswhitepaper

Health Promotion Resource Guide: Choosing Evidence-based Practices for Reducing Obesity and Improving Fitness for People with Serious Mental Illness

It’s Hard Enough to Change Health Behaviors………..

But Even Harder to Change the Behavior of Organizations…..

What does it take to implement health promotion?

(especially when it is not in the mission, competency, scope of practice, or financing of a health care organization)
Can Behavioral Health Organizations Change Health Behaviors?

Rediscovering the Neck
Are Learning Collaboratives the Most Effective Approach to Implementing a New Practice that Requires a Significant Change in Organizational Culture?

48 mental health organizations:

Three phases of 16 organizations over two years

Estimated Patient Participants: 2400

Randomized

Virtual Learning Collaborative
• Coaching organizations to work together to share processes and outcomes, engage in group problem solving, and apply systems improvement

Training and Individual Technical Assistance
• Individually tailored, phone-based implementation technical assistance

R01MH102325, PI: Bartels
## Participation Over 24 Months

<table>
<thead>
<tr>
<th>Individual Technical Assistance (18 months)</th>
<th>Ongoing engagement with research team (until 24 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Collaborative (18 months)</td>
<td>Ongoing engagement with research team (until 24 months)</td>
</tr>
</tbody>
</table>
Site Selection

Sites selected for each phase to achieve an optimal mix of the following:

- Organizational readiness
- Geographic distribution
- Diversity of patient population
- Organizational size
- Urban vs. rural
In SHAPE Implementation Study

INTEGRATING HEALTH PROMOTION FOR OBESITY IN MENTAL HEALTH ORGANIZATIONS

Download Frequently Asked Questions

Watch a recording of our In SHAPE Informational Webinar

Applications for the In SHAPE Implementation Study are not being accepted at this time.

The Problem: People with serious mental illness (SMI) in publicly funded mental health organizations have a reduced life-expectancy of 25-30 years compared to the general population. Obesity and tobacco use are major causes of this dramatic health disparity. Obesity rates are twice as prevalent among persons with SMI compared to those without SMI — placing this high-risk, high-cost group at substantial risk for diabetes and cardiovascular disease.

The Project: Through a competitive application process, 48 mental health organizations from across the United States will be selected to implement In SHAPE within their organizations — a wellness program designed to improve the physical health of people with serious mental illness, and participate in a research study to advance understanding of how to better address the physical health needs of individuals with serious mental illness.

Benefits to Participating Organizations: The organizations selected to participate will receive (at no cost) —

» Training in the In SHAPE Program;

» Personal trainer certification reimbursement for one designated Health Mentor at a local or online AAFA, NASM, ACE, or ACSM chapter;

» Implementation support through expert technical assistance, and ongoing weekly Health Mentor supervision;

» An iPad to assist the Health Mentor in tracking participant progress and program outcomes.

For more information on In SHAPE:

» Visit: www.kenjue.com/In SHAPE

» Watch: youtube.com/watch?v=R3Ky2baotko&feature=youtu.be

Have additional questions or want more information? Contact Nina Marshall, Director of Public Policy, at NinaM@TheNationalCouncil.org.

http://www.thenationalcouncil.org/training-courses/dartmouths-shape-implementation-study/
InSHAPE
From Community Need, to Research, to Implementation
(The 16 Year Science to Practice Gap!)

Community Development
- Identification of Need, Community Coalition (2002)

Effectiveness Research
- Effectiveness RCT Studies (CDC, NIMH) (2006-2012)

Implementation Research
- Statewide Implementation and Evaluation (2009-2014); Statewide Medicaid Incentives Grant (2011-2016)
- Nationwide Implementation Project (2014-2018)
Is Fidelity the Gold Standard for Successful and Sustainable Implementation?

What About Adaptation and Innovation?

"Adapt what is useful, reject what is useless, and add what is specifically your own."

-Bruce Lee, Martial Artist, Instructor, and Actor
Paradox of Ensuring Fidelity While Promoting Contextually Relevant Change

• Adherence to core intervention (fidelity) vs. the modification (adaptation) of a program to improve the fit for a specific health care setting.

• Chambers et al. assert the goal of long-term program sustainability needs to reflect real-world challenges in the fit between the intervention and the context.

• Fidelity consistent vs. fidelity inconsistent modifications to InSHAPE health promotion program.
What if Organizations Change The Intervention? When are Adaptations Harmful? When do They Improve Outcomes and Sustainability?

• Semi-structured telephone interviews with InSHAPE supervisors and mentors to identify and describe modifications 18 months post-implementation training.

• Identify fidelity-consistent adaptations and fidelity-inconsistent modifications.

• Explore relationships of fidelity-consistent adaptations and fidelity-inconsistent adaptations to:
  (a) organizational predictors; (b) implementation outcomes; (c) participant outcomes; (d) sustainability.
But How Do We Spread and Sustain Health Behavior Change?
Participants wore the device for an average of 89% of the days they were enrolled in the program.

Half of participants wore the device 100% of days enrolled.

Abstract
Obesity prevalence is nearly double among individuals with serious mental illness (SMI), including schizophrenia spectrum disorders, bipolar disorder, and depression, in the general population compared to the general population, 90% of adults own cell phones, and 58% own smartphones, with the smartphone ownership occurring among low-income individuals with SMI. Studies suggest that these trends, among individuals with SMI, may impact the potential for using these technologies such as lifestyle interventions targeting exercise may be beneficial in this vulnerable group. Studies in the general population suggest that wearable devices reporting weight loss in this vulnerable group. We evaluated the feasibility and acceptability of popular m-health technologies such as lifestyle interventions targeting exercise may be beneficial in this vulnerable group. Studies in the general population suggest that wearable devices reporting weight loss in this vulnerable group.
Finding: Step Count and Weight Loss

Significant association between average daily step count and weight loss ($p=0.0314$)

Encouraging participants enrolled in lifestyle interventions to collect more steps may contribute to greater weight loss.

Social Media for Health Promotion Among People with Serious Mental Illness?

- Over 2 billion social media users worldwide (over 1.5 billion Facebook users)
- Wide access to online communities
- Potential to:
  - Challenge stigma
  - Increase consumer activation
  - Deliver interventions for mental and physical wellbeing

Source: Aschbrenner, Naslund, & Bartels (Under Review). Psych Rehab J

The future of mental health care: peer-to-peer support and social media

J. A. Naslund¹,²*, K. A. Aschbrenner¹,³, L. A. Marsch³,⁴ and S. J. Bartels¹,³,⁵
New Project: Facebook for Smoking Cessation in Serious Mental Illness

- 8-week Facebook intervention for adults with serious mental illness
- Funded by a NIDA P30 Center
- Aim to increase motivation to quit
- Explore how peer interactions influence motivation to quit
- Enrolling 120 people across iterative pilot studies
How About Peers?  
What About Technology?

Peer Health Coaching:  
• Supporting illness self-management  
• Mutual exchange of ideas and problem solving  
• Role modeling

Technology:  
• mHealth  
• Social media
PeerFIT Overview

- Group-based behavioral weight management
- Supported exercise groups
- Technology support

Goals:
- Lose 7% of baseline body weight
- Increase physical activity to 150 minutes per week

Over 6 month period
PeerFIT mHealth

- Text Messaging Support
- Accelerometer Activity Tracking
- Use existing technology
Can lifestyle interventions lead to clinically significant cardiovascular risk reduction among young adults?
Boston Fit Forward Lifestyle Study for Young Adults

144 Young Adults
Ages 18 to 35
BMI ≥25 kg/m²
SMI Diagnosis

Randomized

12 Month Study

- Basic Education in fitness and nutrition supported by a wearable Activity Tracking device (BEAT)
- Group-based peer support and mobile health technology (PeerFIT)

Aschbrenner PI, NIMH
PeerFIT Lifestyle Program

• Group coaching with weight management sessions and exercise groups

• Private Facebook group moderated by the coach where participants can connect outside of program sessions

• Wearable fitness tracker (Fitbit) for self-monitoring physical activity

• Weekly text messages from the coach with reminders and encouragement to be physically active, eat healthy and flavorful foods, and use self-monitoring techniques
Once weekly PeerFIT exercise group sessions

- Fun and challenging
- Uses minimal equipment
- Does not require a gym
- Participants learn ways to exercise in their natural environments
Other Approaches?

Can incentives help to prevent chronic diseases in at-risk Medicaid populations?

Does paying people with complex health conditions to exercise, change their diet, and stop smoking work?
Can Financial Incentives Help?

- $10 M for 5 year CMS award to NH
- One of only 10 states funded
- 1600 Obese Adults: In SHAPE and/or Weight Watchers and Academic Detailing to Improve Prescribing
- 1200 Smokers: CBT, Quit-line or Referral
- Half Randomized to Financial Incentives
Summary

• Conventional mental health services are failing to reverse the early mortality health disparity ...and escalating costs of care are unsustainable.

• Evidence-based self-management and health promotion interventions exist– but dissemination and implementation has been limited.

• A series of studies by our group (and others) support the potential effectiveness of automated telehealth and mobile health supporting self management of physical and mental health conditions.

• Peer support and mobile health and social media hold promise for scalability and sustainability
The Dartmouth Health Promotion Implementation Research Team

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MH089811,
R01MH102325,
MH078052
R24MH102794
CDC U48DP005018

Health Promotion Research Center at Dartmouth