Development and Evaluation of a Family Nurse Practitioner-Directed Weight Management Program
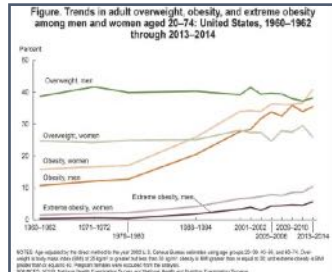
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An evidence-based scholarly project submitted in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice

Background

- Prevalence of obesity has steadily increased since 1960
- As of 2010, more than 78 million adults in the United States (US) were obese with a body mass index (BMI) >30kg/m²
- Obesity is associated with multiple co-morbidities, many of which are among the leading causes of death in the US

Figure. Trends in adult overweight, obesity, and extreme obesity among men and women aged 20–74: United States, 1960–1962 through 2013–2014

- The United States spends significantly more on healthcare than other developed nations, but has higher rates of obesity and chronic disease
- Compared with normal-weight patients, obese patients incur 46% increased inpatient costs, 27% more physician visits and outpatient costs, and 80% increased spending on prescription drugs
- As of 2008, obesity accounted for approximately $147 billion in medical spending in the United States

Problem

- Existing literature supports the impact of a 12-week comprehensive weight management program in achieving clinically significant weight loss. However, the role of the primary care provider (PCP) in this sort of program is inconsistent and poorly defined in the literature.
- Some barriers to the treatment of obesity in primary care include poor understanding of clinical practice guidelines (CPGs), time constraints, and the PCP's own sense of inadequacy in treating obesity

Available Knowledge

- Total body weight loss of at least 3-5% can correspond with clinically significant reductions in metabolic and cardiovascular risk factors
- Weight loss results in reduced risk of all-cause mortality and reduced medical spending
- Multiple studies show the effectiveness of primary-care based interventions that include behavioral, nutritional, and pharmacologic therapies to achieve significant weight loss in 12 weeks
- Available CPGs reviewing prevention and management of obesity:
  - American Heart Association (2013)
  - European Association for the Study of Obesity (2015)
  - The Endocrine Society (2015)
  - U.S. Department of Veterans Affairs (2014)
 - U. S. Preventive Services Task Force (2012)

Specific Aims

"In adults over the age of 18 with a body mass index of greater than 30, does a comprehensive primary care provider-managed weight loss program including nutritional, behavioral, and pharmacological therapies, as appropriate, compared to routine primary care and follow-up appointments, affect quality of life as measured by the SF-36 and BMI over a 12 week period?"

Rationale

Evidence-based Practice Model   Transtheoretical Model of Behavior Change
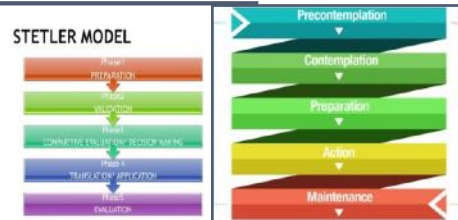
Context

- Chesapeake Health Care – Federally Qualified Health Center
- Adult medicine, primary care office servicing 1,000 patients/week
- Low income, rural population on Maryland's Eastern Shore
- Inclusion criteria:
  - 30kg/m²
  - English-speaking
  - Seen by PCP within the past year
  - Non-pregnant
  - No history of bariatric surgery

Interventions

- Informed by CPGs and USPSTF recommendations
- At least 6 contacts: 2 group sessions, 2 individual sessions, 2 telephone/electronic contacts over 12 weeks
- Track daily dietary and exercise habits with an electronic self-recorded diary
- Mediterranean diet advised to decrease caloric density of foods, increase intake of plant-based foods, reduce long-term risks of chronic diseases
- Drink at least 2 liters of water/day
- Exercise at least 150 minutes/week
- Pharmacological therapies as appropriate
- Behavioral and nutritional counseling

Goals:
3-5% total body weight loss in 12 weeks
Improved quality of life scores

Measures

- Measures at Week 0 and Week 12
  - BMI
  - Weight in kilograms
  - Calculation of percentage of total body weight change
  - 36-Item Short Form Survey (SF-36) by RAND Health

1) Physical functioning
2) Role limitations due to physical health
3) Role limitations due to emotional problems
4) Energy and fatigue
5) Emotional well-being
6) Pain
7) Social functioning
8) Perception of general health

Analysis

- Descriptive statistics
- Inferential statistics
- Paired sample *t*-test comparing means
- Statistical significance $p < 0.05$
- Single cohort study

Ethical Considerations

- Analysis using SPSS-X for Windows
- Confidentiality of data and personal health information
- Patient autonomy/Informed consent
- Non-maleficence
- Veracity in billing practices
- Copyright laws for SF-36
- Institutional approval through CHC and Wilmington University

Results

Statistically Significant Findings

Pairings Comparing Means	Number (n)	Mean	Std. Deviation (SD)	Correlation	Significance (p)
Wk0 WtKg – Wk12 WtKg	13	3.21	2.38	0.996	0.00039
Wk0 BMI – Wk12 BMI	13	1.08	0.77	0.996	0.00027
Wk0 WtKg – Wk12 WtKg	29	1.92	2.52	0.997	0.00031
Wk0 BMI – Wk12 BMI	29	0.6	0.96	0.995	0.0022
Wk0 PF – Wk12 PF	13	-8.46	8.01	0.937	0.0025
Wk0 EF – Wk12 EF	13	-23.46	22.12	0.417	0.0024
Wk0 GH – Wk12 GH	13	-15	12.58	0.615	0.001

Note: Wk = Week. WtKg = Weight in Kilograms. BMI = Body Mass Index. PF = Physical Functioning. EF = Energy and Fatigue. GH = General Health.

Comparison of Weight Changes Between Initial and Final Samples

Weight Changes by Group	Number (n)	Mean	Min.	Max.	SD
Initial Sample					
Total weight change (%)	29	-1.56%	2.56%	-5.25%	2.31
Weight change (kg)	29	-1.91	2.38	-7.39	2.53
Final Sample					
Total weight change (%)	13	-2.7%	2.56%	-5.25%	2.19
Weight change (kg)	13	-3.21	1.8	-7.39	2.38

Note: Kg = kilograms.

Impact of MyFitnessPal (MFP) on Weight Loss Goals

Group	Number (n)	Self-reported daily/almost daily use of MFP	Met weight loss goal
Dropout	16	12.5% (n = 2)	18.75% (n = 3)
Final	13	61.54% (n = 8)	61.54% (n = 8)

Discussion

- The final sample (*n* = 13) experienced statistically significant weight loss (CI 95%) with a mean reduction in weight of 3.21 kg (-7.39 to 1.8, *SD* = 2.38) from Week 0 to Week 12 (*p* = < 0.001). Mean BMI was reduced by 1.08 kg/m² (-1.9 to 0.8, *SD* = 0.77, *p* <0.001).
- When partial data sets were considered for all participants (*n* = 29), statistically significant weight loss was also observed, with a mean reduction in weight of 1.9 kg (*SD* = 2.52, *p* = < 0.001) and a mean reduction in BMI of 0.6 kg/m² (*SD* = 0.96, *p* = 0.002).
- Eleven participants (37.9%), achieved clinically significant weight loss of at least 3% their total body weight, with the majority of these individuals (*n* = 8) in the final sample of 13 participants who met all criteria for the 12-week program.
- Statistically significant changes (CI 95%) were seen in three subscales of the SF-36 when comparing Week 0 and Week 12 scores: physical functioning (PF), energy and fatigue (EF), and general health (GH). Initial mean PF was 66.92; final mean PF increased to 75.38 (*SD* = 22.95, *p* = 0.002). Initial mean EF was 40.38; final mean EF improved to 63.85(*SD* = 21.33, *p* = 0.002). GH scores also increased from 48.84 to 63.85 (*SD* = 13.72, *p* = 0.001).
- Mean scores of other subscales of QOL also increased from Week 0 to Week 12, with a 17.34-point increase in role limitations due to physical health (RLPH), a 9.85 point increase in emotional well-being (EWB), a 9.62 point increase in social functioning (SF), and a 7.88 point increase in pain (P). The only subscale score that decreased from Week 0 to Week 12 was role limitations due to emotional problems (RLEP), with a mean score reduction of 5.13 points. None of these other subscale score changes were found to be statistically significant.

Conclusions

- A primary care provider-directed weight management program can lead to clinically and statistically significant weight loss among adult patients with obesity in a rural primary care setting.
- Participants who completed all program requirements experienced statistically significant weight loss, reduction in BMI, and improvement in QOL scores in the subscales of physical functioning, energy and fatigue, and general health.
- Participants who enrolled in the program but did not complete all requirements also had statistically significant weight loss and reduction in BMI.
- QOL scores for the final sample improved in seven out of eight subscales, including role limitations due to physical health, emotional well-being, social functioning, and pain.

Implications for Advanced Nursing Practice

- A FNP-directed weight management program can positively and significantly affect participants' BMI and QOL
- Patients can benefit from increased PCP involvement in their weight loss efforts
- Evidence-based weight loss interventions in the primary care setting can lead to clinically significant outcomes
- Multidisciplinary collaboration can lead to policy and practice change that impacts individual and population health
- Potential benefits: increased revenue and patient satisfaction, improved health outcomes, and decreased healthcare costs and spending

Sustainability

- Designated time slots for individual and group weight loss sessions
- Shared medical appointments/group medical visits
- Appropriate marketing among the established patient base at CHC
- Referrals from other adult medicine providers
- Ongoing clinical and corporate staff support
- Continuing education in obesity management

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