

Predictors Of Weight Loss Outcomes In Obesity Care

- Nikhil V. Dhurandhar**
Texas Tech University, Lubbock, TX, USA
- Lee M Kaplan**
Massachusetts General Hospital, Boston, MA, USA
- Theodore K. Kyle**
ConscienHealth, Pittsburgh, PA, USA
- Kenneth J. Tomaszewski**
KJT Group, Inc., Honeoye Falls, NY, USA

- Pernille Auerbach**
Novo Nordisk A/S, Søborg, Denmark
- Boris Stevenin**
Novo Nordisk Inc., Plainsboro, NJ, USA
- Angela Golden**
NP from Home, LLC., Munds Park, AZ, USA

Background

- Clinically meaningful, sustained weight loss (WL) is achievable for some but challenging for most people with obesity (PwO).
- To better understand factors contributing to WL outcomes, we examined attitudes and behaviors related to obesity care in a nationally representative sample of PwO from the ACTION (Awareness, Care, and Treatment In Obesity maNagement) Study.
- The ACTION study was developed by a multidisciplinary team of obesity experts from clinical practice, basic science, patient advocacy, employer, and public policy fields organized as a steering committee.

Objectives

- Determine independent factors associated with self-reported sustained weight loss (WL) success among PwO.
- Provide insight into the demographic, behavioral, and attitudinal factors that predict weight loss.

Study design

- A cross-sectional, US-based, stratified sampling of PwO was used with the following inclusion criterion: body mass index (BMI) ≥ 30 kg/m² by self-reported height and weight.
- Adult PwO (n=3,008) completed online surveys assessing recent WL outcomes and associated attitudes and behaviors.
- Respondents were recruited through an online panel.
- A multivariate logistic model compared variation in WL success (dependent variable) defined as:
 - Weight history: at least 10% WL in previous 3 years; and
 - Success: WL at the time of survey response that was maintained for at least one year (by respondent report)

Predictive Outcomes Model

- Statistical patterns were analyzed among 140 independent variables grouped into 3 domains (demographics, behavioral, attitudinal) and reduced to the core variables for the model as follows:
 - Bivariate odds ratios on the dependent variable (WL success) were computed.
 - Independent variables with large effect sizes and significant *practical* implications were identified.
 - Variance inflation factors were used to assess the degree of multicollinearity present among the remaining 32 independent variables; no variables were removed at this step.
 - To achieve a parsimonious model, a purely statistical approach was used to reduce the input space. A Bayesian variable selection approach was used to overcome the biases and shortcomings of stepwise variable selection.
 - A logistic regression model was estimated using the 9 remaining independent variables; 2 were removed for non-statistical significance and high degree of correlation with other independent variables.
 - Seven characteristics taken from demographic, attitudinal and behavioral survey domains were included in the model.

Results

Table 1. Weight History – 1 Year ago and 10 Years ago

- Self-reported weight history one and ten years prior were both significantly associated with WL success, controlling for relative weight change over time.
- Greater weight one year prior decreases odds for WL success; greater weight ten years prior increases odds of WL success.

Variable Type	Variable Description	Variable Specification	Odds Ratio and 95% CI*	Mean Weight at each Time Period (self-reported)*
Demographic	Weight history 1 year ago	Continuous	0.99 (0.99-1.00)	Mean = 248lbs
Demographic	Weight history 10 years ago	Continuous	1.02 (1.01-1.02)	Mean = 221lbs

Table 2. Negative Predictors of Weight Loss Success

- PwO who reported not receiving a formal “obesity” diagnosis and PwO who felt their lack of motivation was a barrier to WL had lower odds of reporting WL success, while controlling for other factors such as their changes in weight and attitudes towards initiating weight loss.

Variable Type	Variable Description	Variable Specification	Odds Ratio and 95% CI*	PwO Affected*
Demographic	Formal diagnosis of obesity	No, Not sure {2, 3} -> 1 Yes {1} -> 0	0.64 (0.44-0.92)	No/Not sure = 44%
Attitudinal	Barriers to initiating a weight loss effort: my lack of motivation	Agree {4, 5} -> 1 Do not agree {1, 2, 3} -> 0	0.61 (0.44-0.86)	Agree (4, 5) = 52%

Table 3. Positive Predictors of Weight Loss Success

- Compared with PwO who did not meet the criteria for WL success, PwO with WL success reported: 1) Health care providers (HCPs) more often recognized their previous WL efforts; 2) They had more motivation to lose weight; and 3) They were more inclined to discuss weight with a diabetes educator.

Variable Type	Variable Description	Variable Specification	Odds Ratio and 95% CI*	PwO Affected*
Attitudinal	Frequency of HCP recognition of previous weight management efforts	Often {4, 5} -> 1 Not often {1, 2, 3} -> 0	1.99 (1.43-2.77)	Often (4, 5) = 39%
Attitudinal	Attitudes toward weight loss: I am motivated to lose weight.	Agree {4, 5} -> 1 Do not agree {1, 2, 3} -> 0	1.81 (1.28-2.54)	Agree (4, 5) = 45%
Behavioral	HCPs discussed weight with/would discuss weight with: Diabetes Educator	Yes {1} -> 1 No {2} -> 0	1.23 (0.78-1.93)	Yes = 10%

*Odds ratios, mean number of pounds, and PwO affected percentages were calculated using weighted data and correspond to the sample used for model estimation.

Discussion

- Self-reported short-term weight history has a moderately negative impact on successful weight loss outcomes, indicating that PwO are more likely to achieve success over a longer period of time. This is supported by the positive impact of weight on a longer time scale of 10 years.
 - These variables can more generally be considered “control” variables thus ensuring other model parameters have an independent effect, after controlling for weight history.
- Discussions with HCPs who acknowledge and support previous weight loss efforts increases the odds of a successful weight loss attempt.
- Motivation is a key to patients being successful; however, it is not enough to help motivate an initial weight loss effort. If patients are continually motivated throughout the weight loss process they are more likely to be successful. This is reflected in the fact that both at the start and during, motivation remains independently relevant.
- Formally diagnosing PwO with obesity is also associated with WL success; perhaps this may ensure HCPs are engaged in supporting PwO in their WL efforts.

Conclusions

- Weight loss success by our definition was consistent with PwO-reported weight loss history.
- PwO perceived that support, motivation for weight loss, and reinforcement and engagement with HCPs are associated with weight loss success, even after controlling for weight history.
- This study underscores the potential role of motivation and engagement of PwO in weight loss success and provides a strong foundation for exploring mechanisms for these factors to predict success. Understanding these mechanisms should help identify important targets to enhance obesity treatment outcomes.