Associations between Social Support, Perceived Food Environment, and Weight Status in the International Weight Control Registry

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Introduction

- Obesity is a multifactorial disease, characterized by high weight status and excessive adipose tissue. It is associated with higher risk of developing Type 2 Diabetes Mellitus, cardiovascular disease, cancer, and mortality.[1]
- **Social support** has been shown to correlate with weight status across multiple cohort studies, although results have been mixed.
- A meta-analysis (n=148) found that stronger social relations were associated with increased likelihood of overall survival by 50%.[2]
- Helpful social interactions yield favorable weight outcomes.[3,4,5]
- **Perceived food environment** can be defined by perception of accessibility, availability, and affordability.
- Certain aspects of food behavior, such as cultural norms or food preferences, are not quantifiable by measures of *objective* food environment.[6,7]
- There are associations between perceived *quality* of fruits and vegetables and intake of fruits and vegetables, as well as the perceived *availability* of fresh produce and fruit consumption.[6,8]

Fig 1. Relationship between social support, perceived food environment, and weight status

Objective

- Determine interactions between social support, perceived food environment and weight status.

Methods

International Weight Control Registry (IWCR)

- A web-based, cross-sectional study seeking to identify weight management strategies in an international population.[9]
- This study solely utilized data from a subset of the study population within the United States.

Perceived Food Environment

- Three-question survey to quantify *availability* and *quality* of fresh fruits and vegetables, and the *availability* of low-fat food products.[8]
- A higher score (0-12) indicates higher perceived food availability.

Social Support

- Sallis Social Support for Diet and Exercise scale, three scores:
  Diet Encouragement of healthy eating habits (5-10)
  Diet Discouragement from healthy eating habits (5-10)
  Exercise Support for habitual exercise (10-50)
  Higher scores in Diet Encouragement and Exercise Support subscales indicate more support.
  Higher score in the Diet Discouragement subscale indicates more discouragement.

Statistical Methods

- All analyses were conducted on SAS.
- Final sample size: Social Support n=1,248 , Perceived Food Environment n=1,263
- Generalized linear model with Gamma distribution of BMI
  Covariates: age, sex, race, ethnicity, education level, household income
- Chi-square test using score tertiles and BMI categories, defined as:
  Normal weight (<25 kg/m^2)
  Overweight (≥ 25 - <30 kg/m^2)
  Obese (≥ 30 kg/m^2)

Results

Table 1. Participant Characteristics

Variable	Category	n	% or Mean ± SD
Age		1,247	51.83 ± 0.41
Sex	Female	1,048	84.0
	Male	199	16.0
BMI		1,247	33.1 ± 0.2
Race	White or Caucasian	958	77.0
	Black or African American	193	15.5
	More than one race	31	2.5
	Asian	28	2.3
	Other	12	1.0
	Prefer not to specify	10	0.8
	American Indian or Alaska Native	6	0.5
	Unknown	4	0.3
	Native Hawaiian or other Pacific Islander	3	0.2
Ethnicity	Not Hispanic or Latino	1,159	93.2
	Hispanic or Latino	55	4.4
	Prefer not to specify	19	1.5
	Unknown	10	0.8
Income	Less than $25,000	111	9.01
	$25,000-$49,999	229	18.6
	$50,000-$79,999	309	25.1
	$80,000-$130,000	314	25.5
	Greater than $130,000	269	21.8

Fig 2. Chi-Square Visualization: BMI Categories vs. Exercise Score Tertiles

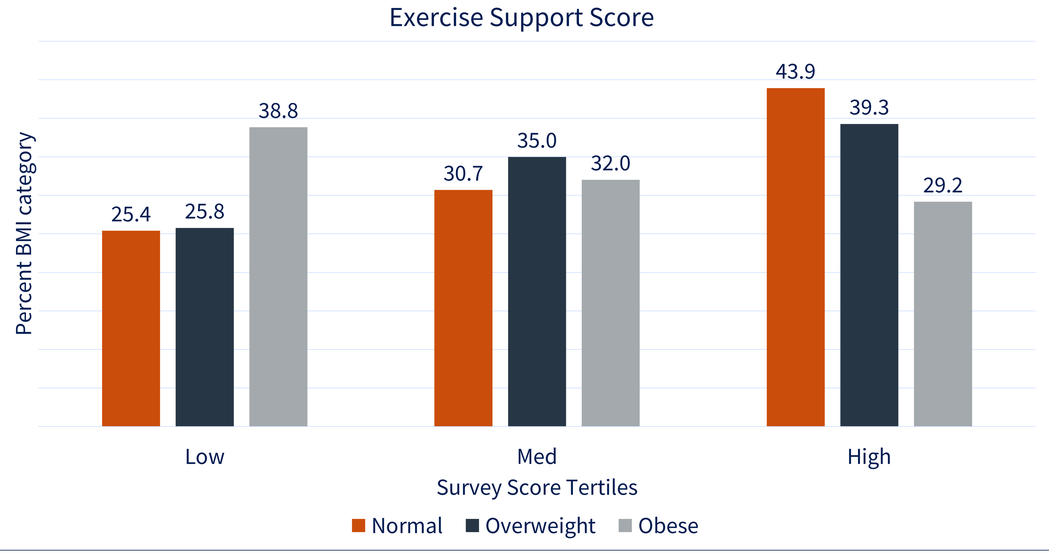

Table 2. Parameter Estimates from Gamma Regression Model with Log Link Predicting BMI

Parameter	Estimate	Standard Error	P-value
Intercept	3.417	0.043	<.0001
Diet Encouragement	0.011	0.002	<.0001
Diet Discouragement	-0.0001	0.001	0.956
Exercise Participation	-0.006	0.001	<.0001
Food Environment Score	-0.008	0.002	<.0001

Conclusions

- Parameters of social support and perceived food environment were statistically significantly associated with BMI within the U.S. cohort of IWCR.
- Higher diet encouragement is associated with a higher BMI, whereas high exercise encouragement is associated with lower BMI.
- Social support for diet encouragement might be higher in those with higher BMI due to increased need for support, similar findings to Craven et al.[10]
- Perception of positive food environment is associated with lower BMI.
- Race and ethnicity were predictive of BMI throughout all models.
- **Significance**: Increasing our understanding of non-biological determinants of health can open new avenues for targeted interventions to combat obesity.
- **Limitations**: Cross-sectional design, use of tertiles of scores limits ability to compare results with other populations.
- **Next Steps**: determine if race/ethnicity moderate the associations between social support, perceived food environment, and BMI.

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