Assessment of Quality of Life in Obese Individuals

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Introduction

Recent reviews have described the potential adverse effects of obesity on quality of life (1,2). Impairments have been reported in physical functioning, including general health (3–6) and bodily pain (7), as well as in psychosocial status (8). In the latter domain, as many as 20% to 30% of individuals who seek weight reduction have been found to suffer from binge eating (9,10) or depression (11,12).

Over the past 20 years, numerous instruments have been developed to assess quality of life (1,2,13,14). This article briefly reviews the meaning of this term and then examines measures that are likely to be the most useful with obese persons. Four sets of instruments are examined. The first consists of generic, broad-spectrum measures that assess multiple domains including physical, social, and vocational functioning. The second set consists of condition-specific measures that assess symptoms or experiences that are most likely to occur in patients with obesity (e.g., stigmatization, body image concerns, food preoccupation). The third and fourth sets of instruments assess depression and binge eating, respectively. We believe that these two complications should be evaluated, in addition to the more general construct of quality of life.

Health-Related Quality of Life

Quality of life has become a buzz word in medicine, psychology, and society at large. The term is used to describe events that range from satisfaction with one's work or leisure activities to the physical and economic burden imposed by specific illnesses (15). Katschnig (16) has aptly conveyed the breadth of this construct, defining quality of life as a "loosely related body of work on psychological well-being, social and emotional functioning, health status, functional performance, life satisfaction, social support, and standard of living, whereby normative, objective, and subjective indicators of physical, social and emotional functioning are all used." The present review focuses on health-related quality of life (HRQOL). This domain typically assesses patients' limitations in physical, emotional, social, or vocational functioning, using either general constructs or those developed to capture dysfunction associated with specific diseases.

The HRQOL measures reviewed here were selected on the basis of their (1) relevance to obesity; (2) psychometric properties (i.e., high reliability and validity); (3) acceptance by researchers (i.e., widespread use); and (4) ease of administration (i.e., low cost and patient/administrator burdens). Although no instrument is ideal, there are several good options for use with obese individuals.

Generic Measures of HRQOL

Generic measures assess multiple domains of functioning including mobility, self-care, and physical, emotional, and social functioning. They may be used with a wide range of patient populations (17). These instruments allow investigators to compare the degree of impairment or suffering associated with different illnesses, as well as relative improvements in functioning in response to treatment. They may, however, lack precision in measuring outcomes that are specific to the concerns of obese individuals (e.g., poor body image, food preoccupation).

Medical Outcomes Study: Short Form-36. The most commonly used *generic* instrument is the Medical Outcomes Study questionnaire. It was originally developed to measure health outcomes as part of a 2-year observational study of more than 22,000 adults (18). The questionnaire was modified in 1989 (19) and again in 1992 to the current 36-item Short-Form General Health Survey (SF-36) (20).

The SF-36 assesses eight health domains: 1) limitations in physical activities because of health problems; 2) reductions in usual role activities attributable to physical or emotional problems; 3) limitations in usual role activities because of physical health problems; 4) bodily pain; 5) general mental health (i.e., psychological distress and well-

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Table 1. Reliability and validity of SF-36 scales

Scale	Internal consistency	Test–retest reliability	Validity
Physical functioning	0.92	0.81	−0.63
Role limitation (physical)	0.83	0.69	−0.46
Pain	0.81	0.78	−0.59
Social function	0.85	0.60	−0.67
Role limitation (emotional)	0.83	0.63	0.38
General health	0.79	0.80	0.45
Vitality	0.87	0.80	0.45
Mental health	0.90	0.75	0.60

Internal consistency and reliability coefficients are based on general practice patients in the United Kingdom (24). Validity coefficients are in relation to a variety of quality of life measures (24). Negative validity coefficients reflect scales that are scored in opposite directions.
SF-36, short form-36.

being); 6) limitations in role activities because of emotional problems; 7) vitality (i.e., energy and fatigue); and 8) general health perceptions (20). Six of the eight domains load on factors that assess either physical health (physical functioning, physical role, and bodily pain) or behavioral health (mental health, emotional role, and social functioning) (21). Of the 36 items, 39% evaluate activity levels (22). Time for completing the questionnaire is 5 to 10 minutes.

The SF-36 has well-established internal consistency, test–retest reliability, and validity (20,23) (see Table 1), as demonstrated in a variety of patient populations throughout the world (24). In obese populations, increasing impairment (particularly on scales assessing physical dimensions; Table 2) has been reported with increasing weight (4,25–32). Improved functioning has been observed with weight loss (principally on scales assessing physical health) (28,33). Most studies of weight loss have been with surgical interventions (1,33,34), although investigations of lifestyle modification (7,35) and pharmacotherapy (36) have recently appeared.

The Nottingham Health Profile. The Nottingham Health Profile (NHP) was developed in England in 1975, based on interviews with 768 patients with a variety of chronic medical conditions. The current version was published in 1981 (37). The instrument contains 45 subjective statements divided into two parts. Part I includes 38 items that assess distress in the following six domains: 1) energy; 2) physical mobility; 3) emotional reaction; 4) pain; 5) sleep; and 6) social isolation. Part II assesses the degree to which health problems affect the following seven domains: 1) occupation; 2) ability to perform jobs around the house; 3) social life; 4) home relationships; 5) sex life; 6) hobbies; and 7) holidays (29). The instrument takes 10 to 15 minutes to complete.

The NHP has adequate internal consistency (>0.58) and strong validity (37–39). It has been translated into many languages (38,40–43) and used in diverse medical and patient populations (38,39). The NHP has not been widely used with obese individuals, although two studies found improvements on the scale after surgically induced weight loss (44,45). The instrument seems to capture treatment-related changes with other medical conditions (38,39).

The Sickness Impact Profile. The Sickness Impact Profile (SIP) is a 136-item general health status questionnaire that is widely used in the United States and Europe (46–48). It emphasizes observable behavior (e.g., "I sit during much of the day") and does not contain subjective evaluations of well-being. The SIP measures two primary dimensions: physical functioning (body care and movement, walking, and mobility) and psychosocial functioning (emotional behavior, social interaction, alertness behavior, and communication). It requires ~30 minutes to complete. Therefore, it is more burdensome to patients than the previously described instruments. Although a shorter 68-item version of the SIP has been constructed (49,50), it is not yet widely used and awaits further validation.

The SIP has strong internal consistency and test-retest reliability (r = 0.81 to 0.97), but only modest criterion validity with other clinical measures of disease (r = 0.38 to 0.48) (46). It has been translated into several languages and used in a variety of medical populations (51). As with the NHP, few studies have used the SIP with obese individuals (52,53).

Obesity-Specific Measures of HRQOL

In contrast to generic measures, condition-specific instruments are designed to capture symptoms or experiences associated with a specific disorder. There are, for example, quality of life instruments designed specifically for patients with diabetes (54), arthritis (55), and asthma (56), to name but a few. Several instruments have been developed for obesity (3–6,57–59). An obesity-specific measure has the potential advantage of capturing experiences that are frequently reported by obese individuals, such as feeling socially uncomfortable when swimming in public, shopping for clothes, or applying for a job. Such experiences are not assessed by generic measures of HRQOL or by mood inventories. In addition, condition-specific measures tend to be more sensitive to change than are generic measures (60,61). The main disadvantage of obesity-specific instruments is their limited empirical validation, which is due primarily to their having been only recently developed, and thus, not widely used.

Table 2. SF-36 scales

Concepts	No. of items	Range of functioning	
Physical functioning	10	Limited a lot in performing all physical activities including bathing or dressing due to health	Performs all types of physical activities including the most vigorous without limitation due to health
Role-physical	4	Problems with work or other daily activities as a result of physical health	No problems with work or other daily activities as a result of physical health
Bodily pain	2	Very severe and extremely limiting pain	No pain or limitation due to pain
General health	5	Evaluates personal health as poor and believes it is likely to get worse	Evaluates personal health as excellent
Vitality	4	Feels tired and worn out all of the time	Feels full of pep and energy all of the time
Social functioning	2	Extreme and frequent interference with normal social activities due to physical or emotional problems	Performs normal social activities with out interference due to physical or emotional problems
Role-emotional	3	Problems with work or other daily activities as a result of emotional problems	No problems with work or other daily activities as a result of emotional problems
Mental health	5	Feelings of nervousness and depression all of the time	Feels peaceful, happy, and calm all of the time
Reported health transition	1	Believes general health is much worse now than one year ago	Believes general health is much better now than one year ago

Adapted from Ware and Sherbourne (20).
SF-36, short form-36.

Impact of Weight on Quality of Life Questionnaire. The Impact of Weight on Quality of Life Questionnaire (IWQOL) is a 74-item self-report measure that requires ~15 minutes to complete (5). The instrument asks respondents to describe the effects that their weight has on their functioning in eight areas including 1) health; 2) social/interpersonal status; 3) work; 4) mobility; 5) self-esteem; 6) sex; 7) activities of daily living; and 8) eating. A new 31-item version of the questionnaire assesses function in five areas (i.e., physical function, self-esteem, sexual life, public distress, and work) (62). Preliminary data indicate that both the long (5,63) and short (62,64,65) versions of the questionnaire have good test–retest reliability and internal consistency. Both questionnaires also revealed significant improvements in all domains of functioning with weight reduction (62–64).

The IWQOL includes scales that capture experiences that are specific to obese individuals. Examples include: "Because of my weight, I experience discrimination by others," and "Because of my weight, I am self-conscious." Potential drawbacks of the IWQOL include uncertainty concerning the clinical significance of the complaints reported. Data, for example, are needed to indicate the level at which problems with self-esteem or eating behavior meet criteria for established behavioral disorders, as described in the Diagnostic and Statistical Manual of Mental Disorders, Fourth edition (66). Such data would help practitioners distinguish experiences that may detract from optimal happiness or functioning from those that truly impair social, vocational, or mental status. Data are also needed to determine what constitutes a clinically significant change in function in each domain, and the relative contribution of each domain to overall functioning. Finally, the IWQOL asks participants to report the occurrence of negative or adverse experiences and to infer the cause of these experiences, as suggested by the wording, "Because of my weight, I . . ." It would be useful to compare responses to the instrument with and without the inclusion of this inference.

Obesity-Related Problem Scale. The Obesity-Related Problem Scale (OP) is a brief condition-specific measure that was designed for the Swedish Obese Subjects (SOS) study. This investigation is evaluating the long-term effects of weight loss (achieved by bariatric surgery or conventional dieting) on changes in physical and psychosocial health (58). As described by its authors, the OP measures the effects of obesity on psychosocial functioning in everyday life (58). The 8-item scale asks respondents how bothered they are by their obesity in relation to going to a party, going to restaurants or community activities, taking a vacation, trying on and buying clothes, swimming in public places, and having intimate relations.

The OP is psychometrically valid (67) and seems to be responsive to weight reduction in both surgically and conventionally treated patients (58,67). The SOS study found a dose-response relationship between weight loss and changes in OP scale scores (i.e., the more weight loss, the greater the reduction of obesity-related psychosocial problems) (13,67). The scale, however, has not been widely used outside of the SOS study, and convergent and discriminant validity have yet to be determined. As with the IWQOL described above, it also is difficult with the OP to determine the clinical significance of the complaints reported or of the improvements in functioning that may occur with weight loss.

Summary Evaluation and Recommendation

In summary, the SF-36, NHP, and SIP have acceptable psychometric properties and have been standardized on diverse populations. They all measure physical and social domains, and the SF-36 and NHP also assess subjective factors. The SF-36 is recommended for a short yet comprehensive measure of HRQOL. It is the least burdensome for respondents and is easy to administer. It has extensive psychometric validation and has been normed by age and gender for the United States and other populations. Its scales are responsive to treatment of numerous medical conditions, including obesity. In addition, the SF-36 will allow researchers to compare the burdens imposed by obesity with those associated with other disorders. For investigators who desire an obesity-specific measure of quality of life, we recommend the IWQOL, with the qualifications noted. The OP may be useful but needs further investigation in a broader sample of overweight and obese individuals (rather than simply those eligible for bariatric surgery).

Mood and Binge Eating

The SF-36 contains a measure of general mental health. If patients score within normal limits on this scale, further assessment may not be necessary. However, given the increased prevalence of dysthymia and depression in obese individuals who seek weight reduction (12,68–70), particularly among the severely obese (69), we believe it is appropriate to assess mood more fully. Similarly, patients should be evaluated for the presence of an eating disorder, a domain that it is not covered by the SF-36 or any other general measures of quality of life.

Mood

Early population studies generally found few significant differences in psychopathology between obese and nonobese individuals (12). However, a recent well-designed investigation showed that excess weight in women was associated with an increased risk of major depression, suicide attempts, and suicidal ideation (71). (Surprisingly, in men the inverse was found; excess weight was associated with a decreased risk of depression and suicidality.) Increased levels of depression and other psychopathology are common in obese men and women who seek weight-loss treatment (11,72).

The Beck Depression Inventory-II (BDI-II) (73) is a 21-item questionnaire that measures specific symptoms of depression. It is easy to complete (in ~5 minutes), score, and interpret, and its internal consistency, test–retest reliability, and validity are well established (73). Other measures of depression are available, including the Hamilton Rating Scale for Depression (74) and the Center for Epidemiological Studies measure of Depression (75). However, we recommend the BDI-II because of its widespread use and minimal inclusion of items biased by obesity. The BDI-II has been used extensively with obese individuals and is responsive to both weight reduction (76,77) and cognitive interventions (78).

Eating Disorders

Approximately 20% to 30% of obese individuals who seek weight loss report problems with binge eating (9,10,79), usually in association with a depressed mood or related complications (9,80–84). Binge-eating disorder (BED) is characterized by the consumption of large amounts of food in a discrete period of time and by the patient's report of loss of control during the episode. The overeating is not followed by compensatory behaviors (such as vomiting or laxative abuse), thus distinguishing BED from bulimia nervosa. Marked distress must occur in at least three areas, including eating very rapidly, eating until uncomfortably full, eating when not hungry, eating alone, or feeling guilty after a binge (66). Binge eating is a reliable marker of symptoms of depression. By contrast, multiple studies have shown that mood is essentially normal in obese individuals who do not suffer from binge eating (68).

At least three self-administered questionnaires are currently used to assess BED. The Questionnaire on Eating and Weight Patterns-Revised (QEWP-R) (9,10) is a 28-item instrument that provides decision rules for diagnosing BED, bulimia nervosa, and related eating disorders. It has been

found to have adequate validity and reliability (9). The principal drawback of the QEWP-R is that diagnosis should be confirmed by a brief interview. Alternatively, the Binge Eating Scale (BES) (85) is an easily administered 16-item questionnaire that assesses symptoms of binge eating. The scale has adequate internal consistency and validity (85). The BES, however, was developed before the introduction of criteria for BED, and the scale does not include several items needed to diagnose this condition. The BES and QEWP-R are only moderately correlated ($\kappa = 0.58$) (86).

A third option is the Eating Disorder Examination Questionnaire (EDE-Q) (87), a self-report version of the 30- to 60-minute structured interview developed by Cooper and Fairburn (88) to assess bulimia nervosa and related disorders, including BED. The validity of the EDE-Q for diagnosing BED in obese individuals is still being determined (89–91). If favorable results are obtained, this may be the preferred instrument because, in addition to yielding diagnoses, it includes subscales that measure dietary restraint, shape concerns, and related variables. However, until additional data are available, we recommend the use of the QEWP-R in conjunction with a 5- to 10-minute interview. The interview allows the practitioner to confirm that patients who report binge eating, in fact, routinely eat an objectively large amount of food and experience loss of control. The QEWP-R and self-report questionnaires, in general, may overestimate the frequency of binge episodes (92). The interview serves, in part, to address this limitation.

Summary

To assess the impact of obesity on general quality of life, we recommend the SF-36 because of its brevity, ease of administration and coverage of both physical and psychosocial domains. In addition, it provides norms for numerous age groups and patient populations. We also recommend the use of the BDI-II and QEWP-R to assess depression and binge eating, respectively. These latter complications are frequently observed in obese patients who seek treatment.

Current findings indicate that a substantial portion of obese individuals in the general population experience undesired physical or social consequences of their weight that diminish their quality of life in one or more areas (68,70). These complications typically do not require professional attention, but nevertheless, are likely to detract from the individual's optimal enjoyment of work and leisure activities. Further research is needed to identify those individuals who are at greatest risk of progressing from decreased quality of life to clinically significant impairment in physical, social, vocational, or mental status. We believe these individuals are most likely to be encountered in clinical settings and to have a body mass index $\geq$40 kg/m^2 (11,69). It is imperative that they receive appropriate medical and behavioral care, independent of their desire or ability to lose weight.

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