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The Gravity of Weight

Measure for Measure: A Madness in Method for Weight Control

Why don't we know more about obesity than we do?

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In this season of excessive consumption and overindulgence, we might want to consider why control of our weight continues to seem so daunting for most people. Over the years, we have been inundated with news reports almost daily of new studies about obesity and overweight that either contribute little to our existing knowledge or provide information that overtly contradicts previous studies. While there have been literally thousands of published reports, ranging from large epidemiological research to small case studies in peer-reviewed journals, why don't we have more answers and a greater understanding about obesity than we do? Researchers clearly have been trying.

The answer lies in the fact that obesity research, unfortunately, lends itself particularly well to methodological difficulties. Admittedly, there are no impediments that are specific to obesity research. In fact, in his classic 1970s paper, Canadian Professor Dr. David Sackett, delineated 55 categories of potential bias that can occur at any stage of a clinical research study, from conducting an initial literature review and selection of a sample population to measuring and interpreting data collected, and even publishing a study's results.

What exactly is bias in research? It is any systematic error (as opposed to an error by chance) in the design or implementation of a study that can interfere with its validity. In other words, validity, whether internal or external, is essentially the degree to which a study is free from bias. Obviously, when the validity of a study

is compromised in any way, researchers must become much more cautious in making inferences or issuing recommendations to clinicians and patients.

Major impediments to obesity research are of particular importance in the areas of measurement of body composition (particularly of adipose tissue); food and caloric consumption; and physical activity. For example, most obesity studies rely on self-report data that are notoriously inaccurate: people tend to overestimate their height and underestimate their weight, particularly when they are obese. Furthermore, the use of body mass index (BMI) as the standard measure of obesity (weight in kilograms divided by height in meters ^{2}, with obesity defined as a BMI of 30 kg/m2 or greater) is controversial. Since BMI measures not only adipose tissue but also muscle and bone, it can be highly inaccurate in many populations, including athletes (with increased muscle mass) or the elderly, as well as in very tall or short people or even in children. Measuring adipose tissue by use of skin calipers is also potentially inaccurate: it depends on the skill of the examiner and may vary from one examination to another or from one observer to another.

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Measurement of food and caloric consumption, other than on a metabolic hospital unit, whose artificial setting has its own set of complications, is also potentially highly inaccurate. Researchers collect information through food diaries, 24-hour recall, or food-frequency questionnaires. These are subject to distortion either inadvertently due to subjects' faulty memory or intentionally due to subjects' embarrassment over their behavior so that they may tell researchers what they think they want to hear, rather than how they actually behave. Further, subjects may also change their style of eating while they are in the study and fail to adhere to protocol, particularly over the course of a prolonged time-period and so bias their answers. Sometimes, even the control population changes its behavior to follow the protocol of the experimental group.

Likewise, measurement of physical activity also lends itself to inaccuracy: for example, devices such as a pedometer, capture only certain kinds of movement, and people often overestimate how much physical activity they are engaging in or even fail to judge whether an activity is vigorous or moderate. Standard activity tables are actually only general estimates of caloric expenditure, as no two people engage in the same activity similarly.

Of course, inaccuracy in measurement is not the only source of bias. Non-randomization of the sample population is another. For example, those who volunteer for a study may be different from those who don't. Typically, they may be more health-conscious. One of the most publicized long-term studies, for example, is the National Weight Control Registry. Even though this study, begun in the 1990s, has yielded considerable information regarding those successful at weight maintenance, its original sample began as a non-random population solicited through advertisements and not representative of the typical American population.

High attrition (i.e. drop-out) rates, as well, are common in obesity studies, particularly when data collection extends over many years' duration. Typical attrition rates hovering around 50% are not uncommon and can severely compromise the integrity of clinical research. These are only some examples of the limitations involved in obesity research.

Remarkably, given these impediments, we know as much as we do.

About the Author

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In Print: *The Gravity of Weight: A Clinical Guide to Weight Loss and Maintenance*

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