Oral Abstract

Continued Use of the 3500-kcal Rule in Textbooks

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Background: The 3500-kcal rule, though often overly simplistic, is used to linearly predict weight or adipose change in clinical or research settings. We sampled textbooks to assess how quantitative energy balance models (QEBM) are taught, emphasizing the 3500-kcal rule.

Methods: Top 15 Amazon best-selling textbooks in nutrition, diet therapy, preventive medicine, physiology, and physical therapy were identified resulting in 53 unique recent editions. QEBM text was identified and extracted via manually reviewing weight- or energy-balance- related sections and keyword searching in hardcopy- and e-textbooks. Ten books were piloted for text extraction and double coded via a semi-structured coding template. QEBMs (e.g., 3500-kcal rule) were compared to the validated NIDDK body weight planner (BWP) and the Weight Loss Predictor Calculator by Pennington Biomedical Research Center (PBRC) for the average 30 y.o. adult American female (63.5′; 170.8 lbs) and male (69.0′; 199.8 lbs) from NCHS.

Results: We developed 16 coding items, including energy amount; amount and time of weight change; positive/negative QEBM; whether predicting body weight (BW)/fat mass/adipose tissue; approximate/exact predictions; and whether the text prominently acknowledged weight change complexity. Six of 10 piloted textbooks included QEBMs, five of which proposed a 3500-kcal based equation to change BW; specifically, lowering caloric intake by 200-1000 kcal/d to lose 0.4-2 lbs BW/wk. Four of six models presented approximate changes; three of six acknowledged physiological complexity. Compared to BWP and PBRC, the 3500-kcal rule underestimated energy deficits required to lose weight in relatively longer durations (e.g., at 500 kcal/d deficit for 180 days, 3500-kcal rule predicts 26 lbs loss in the average male, while BWP and PBRC predict 18.2 and 14.8 lbs, respectively). We identified at least five other textbooks mentioning the 3500-kcal rule

through digital previews; extraction of texts is ongoing.

Conclusions: Our pilot sample of top-selling textbooks suggests despite availability of more sophisticated-yet-accessible web-based tools to estimate weight change dynamics, the 3500-kcal rule continues to be a basis for energy balance education.