



Home access to a weight scale in the Hispanic/Latino population attending a community-based free clinic

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Abstract

Background: Daily weighing has been shown to help with weight management. In primary care, the majority of virtual visits will ask patients about their weight. However, little is known about whether patients, especially those in the Hispanic/Latino population, have access to a weight scale. Our aim was to determine scale access and perceived height and weight in the Hispanic/Latino population attending a volunteer, no cost, community clinic.

Methods: Questionnaires were issued to patients attending the community clinic and a comparator group attending a medically insured primary care practice.

Results: Only 52% of the Hispanic/Latino patients attending the community clinic had access to a scale compared with 85% of patients in the primary care office. Patients underreported weight and overreported height leading to underreporting body mass index by 0.6 ± 3.2 kg/m².

Conclusions: Healthcare providers who care for uninsured Hispanic/Latino patients in community clinics may need to be aware that patients may not have access to a scale.

KEYWORDS

obesity, overweight, self-weighing, weight management

1 | INTRODUCTION

The current overall rate of adult obesity in the United States (US) is 42% with the highest prevalence seen in racial minority groups, including 47% of Hispanic adults and 46.8% of non-Hispanic black adults.^{1,2} The Hispanic/Latino community makes up 18.5% of the American population and in several states it is the predominant racial minority group.³ In numerous studies, it has been shown that many US adults underestimate their body mass index (BMI) by underreporting weight and overreporting height.^{4,5} A study using NHANES

data found that Mexican Americans underestimate BMI by -0.37 for men and -0.76 kg/m² for women.⁶ Thus, knowing a patient's measured height and weight can help in correctly identifying obesity prevalence. While obtaining measured height and weight is routine for in-person clinic visits, medicine has evolved to include more virtual visits where patients are asked to self-report their current weight. This important part of vital signs relies on patients having a scale on which to weigh themselves.

Additionally, one of the most basic lifestyle changes that health care providers (HCPs) can promote to patients is to weigh

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themselves daily. Studies have shown that in a dose-dependent manner frequently stepping on a scale significantly helps with weight management.⁷⁻⁹ Patients who weigh daily have better weight loss than patients who weigh weekly, monthly, or not all.⁷⁻⁹ In addition, weighing daily is acceptable, perceived positively by patients, and without adverse effects.¹⁰ However, implementing this weight management tool requires access to a weight scale.

The overarching purpose of this study was to evaluate scale access and reliability of reported or perceived height and weight in a community-based free clinic that serves a predominantly Hispanic/Latino population. Data obtained from these Hispanic/Latino uninsured patients were compared with medically insured primary care patients of mixed ethnicities typical of California. The primary goal of this study was to determine whether there are differences in access to a home weight scale in the Hispanic/Latino community using the community-based free clinic compared with a primary care medicine clinic that sees patients with health insurance in the same area. The secondary goal was to evaluate differences in perceived height and weight.

2 | MATERIALS AND METHODS

2.1 | Participants

Participants were recruited from two clinics in the northern San Diego, CA area. One site was a community-based free clinic (St. Leo Medical-Dental Clinic) which provides walk-in primary care to a patient base that is >98% Hispanic/Latino and lacks health insurance. The other site consisted of patients with medical health insurance attending a primary care internal medicine office run by a large multi-hospital medical system (Scripps Health). The insured group is a racially and socioeconomically mixed patient base typical of California. Participant ascertainment was conducted through a convenience sample. From 1 May 2019 to 1 December 2020, all patients presenting at both sites were invited to participate.

2.2 | Assessments

Consenting patients were issued a self-administered questionnaire before they had their height and weight measured.

The questionnaires for both clinics were part of clinical care to help guide future outpatient weight management as medicine was evolving to include virtual visits. The questionnaire assessed the patient's perceived height and weight, whether they see themselves as normal or overweight, whether they have access to a scale, and whether they have diabetes, hypercholesterolemia, or hypertension. In the community clinic, Spanish to English translators were used for all patients unless the healthcare provider was fluent in Spanish. Access was defined as having a scale at home or having access to a scale through work or a neighbor. The translators were guided through the questionnaire with one of the authors.

Clinicians confirmed these diagnoses during chart reviews. Participants' height and weight were measured using a medical weight scale and stadiometer (Seca, Chino, CA).

2.3 | Statistical analysis

The association between categorical variables and clinic type was evaluated with a Chi-square test for independence. Odds ratios were estimated to gauge the effect size and the cornfield method was used to estimate the confidence interval.¹¹ Comparison of continuous variables between groups was conducted with a two-sample *t*-tests assuming equal population variance. Differences between self-reported height and weight with clinical measurements were evaluated using one-sample *t*-tests. Where reported confidence intervals are estimated at 95% confidence. Two height measurements were discarded because they evidenced an errant record; these records deviated by >15.25 cm. Thirty patients (1 from primary care, 29 from the clinic) were excluded due to missing data for either reported height or weight. 52% of the Hispanic/Latino community-based patients and 85% medically insured patients responded yes to having access to a scale.

The study was approved by the Scripps Institutional Review Board as a minimal risk.

3 | RESULTS

One hundred patients at the primary care clinic and 117 patients at the free community clinic consented to participate. All patients at the primary care clinic were health-insured, and all of the patients at the community clinic were without medical insurance. The demographic characteristics of all respondents are shown in Table 1. Only patients with complete height and weight data were included in the final analysis (99 health-insured patients and 86 community-clinic patients).

Community-clinic patients had less access to a scale than primary-care patients ($\chi^2_1 = 21.8, p < 0.001$) (Table 1). The odds of having access to a scale were 5.2 (95% CI; 2.6, 10.5) higher for primary-care as compared to community-clinic patients. Thus, approximately half (52%) of the community-clinic patients reported having access to a scale and 48% did not.

For the group as a whole (both primary-care and community-clinic ($N = 185$)) the measured mean BMI and standard deviation was 29.0 ± 7.09 kg/m². The mean BMI of the community-clinic group was 29.8 ± 6.73 kg/m². The mean difference for the group as a whole ($N = 185$) between actual BMI and reported (perceived) BMI was -0.58 ± 2.39 kg/m². For the community-clinic group, the mean BMI difference was -0.6 ± 3.21 kg/m² ($N = 86$). Both groups underreported BMI. Height difference between reported height and measured height was overreported by a mean of 0.57 ± 3.88 cm for the group ($N = 185, t_{(df = 184)} = 1.99, p = 0.024$) and 0.24 ± 5.28 cm for the community-clinic patients ($N = 86, t_{(df = 85)} = 0.415, p = 0.34$). The

TABLE 1 Patient characteristics and access to a weight scale.

	Primary-care patients (N = 100)	Community-clinic patients (N = 117)	p-value
Female (%)	84	58	<0.001
Age (years)			<0.001
18–25 (%)	4	8	
25–40 (%)	14	21	
40–55 (%)	24	37	
55–65 (%)	11	21	
65–75 (%)	30	13	
75+ (%)	17	0	
Race			<0.001
Asian (%)	21	0	
Black (%)	4	0	
White (%)	48	0	
Other (%)	27	100	
Ethnicity			<0.001
Hispanic (%)	31	100	
Comorbidities			
High cholesterol (%)	18	26	0.22
Hypertension (%)	19	42	<0.001
Type 2 diabetes (%)	6	26	<0.001
	Primary-care patients (N = 99)	Community-clinic patients (N = 83)	
Proportion with scale access (95% CI)	0.85 (0.78, 0.92)	0.52 (0.41, 0.63)	<0.001
Medical health insurance	100%	0%	

weight difference between reported and measured weight was underreported by a mean of -1.10 ± 4.76 kg for the group ($N = 185$, $t_{(df = 184)} = -3.14$, $p = 0.99$) and -1.48 ± 6.23 kg for the community-clinic patients ($N = 86$, $t_{(df = 85)} = -2.21$, $p = 0.98$).

The community-clinic population had a higher disease burden than the health insured population for the three diseases recorded (Table 1). Diabetes was noted in 26% of the community-clinic patients and in 6% of the health-insured patients. Hypercholesterolemia was noted in 26% of the community-clinic patients versus 18% of primary-care patients, and hypertension was reported in 42% of community-clinic patients versus 19% of primary-care patients.

4 | DISCUSSION

This research identifies a previously unrecognized barrier to weight management in the Hispanic/Latino population attending a community-based free clinic. Approximately half of the Hispanic/Latino patients from the community clinic did not have access to a scale. This is an important finding because daily weighing is a well-documented form of lifestyle management for weight loss and

prevention of weight gain.^{7,8} Simply put, HCPs working at similar community clinics need to be aware that patients may not have access to a scale.

As medicine has evolved to include virtual visits, having access to a scale can help with obtaining an important vital sign that is usually obtained at most in-person primary care visits. Many diseases benefit from knowing recent weight changes (e.g., diabetes, hypertension, fluid overload, etc.) and healthcare providers need to be aware that patients may simply not have access to a scale.

Similar to a previous report comparing subjective and objective measures of height and weight, we found that self-reported height was usually taller than measured and self-reported weight was less than measured.⁵ In our study, this led to a BMI that was 0.6 kg/m² lower than that measured. In a previous study by Opichka and Smith in a predominantly low-income US population, overreporting of height and underreporting of weight led to misclassification of BMI in 3%–8% of Hispanic/Latino patients.⁴ It should be noted that underreporting weight and overreporting height is common and our findings were similar to other studies regardless of race or income.^{4–6}

In looking at the disease burden, it was noted in our study that the disease burden was higher in the primarily Hispanic/Latino

community-clinic group versus the racially mixed primary-care group. There are many potential reasons for this difference. It is possible that health-insured primary-care patients have access to specialists for diabetes and other conditions, whereas patients attending the community clinic do not. It is also well recognized that diseases related to obesity, such as diabetes, hypertension, and cardiovascular disease disproportionately, affect the Hispanic/Latino community. The prevalence of type 2 diabetes in the Hispanic/Latino population is about twice that of non-Hispanic whites.¹²⁻¹⁴ Additionally, the comorbid diseases commonly associated with obesity are seen at a lower BMI in the Mexican population relative to Caucasians.¹⁵ These factors highlight the need to address weight management in this underserved group.

This study is limited by the small number of patients. The other limitation is that although patients at the community clinic were 98% Hispanic/Latino, due to the close proximity to the Mexican border, the vast majority were Mexican, and this population represents a specific subset of the Hispanic/Latino community. Also, although our translators were Mexican and fluent in Spanish and English, the questionnaire was not specifically written to be culturally Mexican.

Self-monitoring of weight has been a cornerstone of weight management as well as a lifestyle tool recommended in obesity medicine guidelines.¹⁶ Although HCPs can educate patients to weigh daily, only half of the patients surveyed in the community clinic had access to a scale. Thus, for this lifestyle intervention to be implemented, HCPs need to be aware that patients may not have access to a scale and the clinic would need to provide the scale.

AUTHOR CONTRIBUTIONS

Ken Fujioka: Conceptualization; methodology; investigation; writing - original draft; writing - review & editing; supervision; project administration; funding acquisition. **Jacob Fujioka:** Conceptualization; methodology; investigation; supervision. **Kaley Mafong:** Investigation. **Nicole Wetherhold:** Investigation. **Sally Kim:** Investigation. **Amin Rasul:** Supervision. **Alyssa Lopez:** Formal analysis; writing - review & editing. **Kevin Cummins:** Formal analysis; writing - review & editing.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

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REFERENCES

- Hales CM, Carroll MD, Fryar CD, Ogden CL. Prevalence of obesity among adults and youth: United States, 2015-2016. *NCHS Data Brief*. 2017(288):1-8.
- Ogden CL, Fryar CD, Martin CB, et al. Trends in obesity prevalence by race and Hispanic origin-1999-2000 to 2017-2018. *JAMA*. 2020; 324(12):1208-1210. <https://doi.org/10.1001/jama.2020.14590>
- United States Census Bureau. QuickFacts: United States. 2021. <https://www.census.gov/quickfacts/fact/dashboard/US/PST045219>
- Opichka K, Smith C. Accuracy of self-reported heights and weights in a predominately low-income, diverse population living in the USA. *Am J Hum Biol*. 2018;30(6):e23184. <https://doi.org/10.1002/ajhb.23184>
- Connor Gorber S, Tremblay M, Moher D, Gorber B. A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review. *Obes Rev*. 2007;8(4):307-326. <https://doi.org/10.1111/j.1467-789x.2007.00347.x>
- Gillum RF, Sempos CT. Ethnic variation in validity of classification of overweight and obesity using self-reported weight and height in American women and men: the Third National Health and Nutrition Examination Survey. *Nutr J*. 2005;4(1):27. <https://doi.org/10.1186/1475-2891-4-27>
- Linde JA, Jeffery RW, French SA, Pronk NP, Boyle RG. Self-weighing in weight gain prevention and weight loss trials. *Ann Behav Med*. 2005; 30(3):210-216. https://doi.org/10.1207/s15324796abm3003_5
- Shieh C, Knisely MR, Clark D, Carpenter JS. Self-weighing in weight management interventions: a systematic review of literature. *Obes Res Clin Pract*. 2016;10(5):493-519. <https://doi.org/10.1016/j.orcp.2016.01.004>
- Zheng Y, Burke LE, Danford CA, Ewing LJ, Terry MA, Sereika SM. Patterns of self-weighing behavior and weight change in a weight loss trial. *Int J Obes*. 2016;40(9):1392-1396. <https://doi.org/10.1038/ijo.2016.68>
- Steinberg DM, Tate DF, Bennett GG, Ennett S, Samuel-Hodge C, Ward DS. The efficacy of a daily self-weighing weight loss intervention using smart scales and e-mail. *Obesity*. 2013;21(9):1789-1797. <https://doi.org/10.1002/oby.20396>
- Agresti A. *Categorical Data Analysis*. 2nd ed. Wiley-Interscience; 2002.
- Walker RJ, Strom Williams J, Egede LE. Influence of race, ethnicity and social determinants of health on diabetes outcomes. *Am J Med Sci*. 2016;351(4):366-373. <https://doi.org/10.1016/j.amjms.2016.01.008>
- Menke A, Casagrande S, Geiss L, Cowie CC. Prevalence of and trends in diabetes among adults in the United States, 1988-2012. *JAMA*. 2015;314(10):1021-1029. <https://doi.org/10.1001/jama.2015.10029>
- Centers for Disease Control and Prevention. *CDC VitalSigns: Hispanic Health*. Centers for Disease Control and Prevention; 2015.
- Berber A, Gomez-Santos R, Fanghanel G, Sanchez-Reyes L. Anthropometric indexes in the prediction of type 2 diabetes mellitus, hypertension and dyslipidaemia in a Mexican population. *Int J Obes Relat Metab Disord*. 2001;25(12):1794-1799. <https://doi.org/10.1038/sj.ijo.0801827>
- Jensen MD, Ryan DH, Apovian CM, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American college of Cardiology/American heart association task Force on practice guidelines and the obesity society. *Circulation*. 2014;129(25 (Suppl 2)):S102-S138. <https://doi.org/10.1161/01.cir.0000437739.71477.ee>

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