ORIGINAL ARTICLE

Patient–provider relationship and perceived provider weight bias among American Indians and Alaska Natives

K. L. Gonzales[1], G. E. Garcia[2], M. M. Jacob[3], C. Muller[4], L. Nelson[4] and S. M. Manson[5]

[1]Oregon Health Sciences University-Portland State University School of Public Health, Portland State University, Portland, OR, USA; [2]Department of Sociology, Portland State University, Portland, OR, USA; [3]Department of Education Studies, College of Education, University of Oregon, Eugene, OR, USA; [4]Initiative for Research and Education to Advance Community Health, Washington State University, Seattle, WA, USA; [5]Centers for American Indian and Alaska Native Health, University of Colorado Denver, Aurora, CO, USA;

Address for correspondence: KL Gonzales, Oregon Health Sciences University-Portland State University School of Public Health, Portland State University, 506 SW Mill Street, Suite 450, Portland, OR 97201, USA. E-mail: kelly.gonzales@pdx.edu

Summary

Objective

The objective of this study was to examine patient–provider relationships among American Indians and Alaska Native (AI/AN) patients by examining associations between patient activation, perceived provider weight bias and working alliance. Patient activation is generally defined as having the knowledge, skills and confidence to manage one's health.

Methods

Among a sample of 87 AI/AN adults presenting for general medical care at an urban clinic in the north-west region of the USA, ordinary least squares regression analysis was completed to examine associations.

Results

Better working alliance scores were associated with increased patient activation, while perceived provider weight bias was associated with reduced patient activation. In addition, those with class II obesity had decreased patient activation.

Conclusion

These findings point to the importance of a positive patient–provider relationship in AI/ANs. Optimal patient engagement and subsequent health outcomes warrant additional consideration of patients' perceptions of provider weight bias within the context of health promotion and interventions.

Keywords: American Indian, patient activation, therapeutic alliance, weight bias.

Introduction

Based on population surveillance studies, 70% of American adults have a body mass index (BMI) that would classify them as having overweight or obesity (1). Based on these population-level studies, it is conceivable that many adults who fall within this BMI range may have clinical obesity requiring clinical support and care. However, at the individual level, clinical diagnosis by a qualified healthcare professional is required. Although obesity is a growing concern for all groups, American Indians and Alaska Natives (hereinafter AI/ANs) experience higher burdens of obesity compared with non-Hispanic Whites (2,3), as well as pronounced disparities for obesity-related diseases such as type 2 diabetes and cardiovascular diseases (4,5). Obesity is a chronic disease (6) that can be treated, and its sequelae prevented, through comprehensive care plans, including behaviours that result in weight loss and weight management (7). Success in adhering to therapeutic goals for obesity has been marginal at best in the general population (8); similar outcomes have been observed for AI/ANs (9). Because obesity is a major cause of disability and mortality among AI/ANs, and contributes to significant and increasing healthcare costs (10), it is imperative that comprehensive interventions consider factors that influence desired health outcomes.

There is growing recognition that treating and managing chronic disease, such as obesity, requires health programming that considers health determinants more

broadly by reaching beyond individual-level factors [11–14]. For example, healthcare providers have a critical role in assessing and recommending comprehensive treatment plans for obesity, as well as engaging patients to improve health outcomes by promoting behavioural changes. Studies, including research completed by Sabin *et al.*, consistently show that some providers hold a strong weight bias [15–17], which refers to negative attitudes towards others because they have overweight or obesity [17,18]. Clinical judgment and recommendations may be shaped by these negative beliefs and reduce the quality of health care as well as compromise the patient–provider relationship [11]. Such experiences may also diminish patient engagement, which is integral to interventions that are designed to support patients towards managing their health [19].

With the exception of the recent study by Sabin *et al.* [20], which examined weight bias within the healthcare context as reported by providers – unlike this study, which examines perceived provider bias reported by patients – no other studies of this issue have been conducted among AI/ANs. However, previously published studies that included AI/ANs and examined other forms of bias in health care (such as perceived race-based discrimination during the clinical encounter) have documented that such perceptions are associated with a greater degree of patient disengagement and that individuals reporting perceived discrimination have poorer clinical measures and more unmet need for preventive services than those reporting none [21–23]. Therefore, given the paucity of this research, more work is needed to understand different forms of discrimination, including weight-based discrimination, in relation to healthcare and health disparities among AI/ANs.

The patient–provider relationship has also been associated with patient activation, defined as having the knowledge, skills and confidence to manage one's health [20,24]. Among populations with chronic disease [25] and Latinos [10,26], increased patient activation has been associated with patients reporting positive and quality interactions with their healthcare provider. Patient activation has also been associated with health outcomes. For example, studies in diverse groups of patients with chronic disease have documented that higher patient activation correlates with greater success in practicing self-management behaviours [24,25,27]. There is some evidence that patients with a higher level of activation also incur lower healthcare costs than patients with a lower level of activation [28,29]. Patient activation has particularly significant implications for conditions – such as obesity – that require a high level of patient effort and self-management to achieve desired therapeutic goals [10,24]. While patient activation is a critical attribute of

improved health outcomes, no prior studies have been conducted specifically among AI/ANs.

Therefore, this study examines the association between the patient–provider relationship, patients' perception of provider weight bias and patient activation among a sample of AI/AN patients presenting for general clinical medical care at an urban clinic located in the north-west region of the USA. Because the sample size is small and this study is one of the first to explore the patient–provider relationship, provider bias and patient activation among any population, patients of all BMI strata are included. This study explores the unique contribution of the overall patient–provider relationship and perceived provider weight bias to patient activation. It is hypothesized that perceived higher quality patient–provider relationship will be associated with higher patient activation and perceived provider bias will be associated with lower patient activation.

Methods

Research setting

This study collected data in 2012 from 150 patients at a well-established, non-profit urban community health centre that provides medical, dental, mental health, nutrition, outpatient chemical dependency and traditional Native health care to AI/AN and non-Native patients living in the Northwestern USA. The centre offers medical services Monday–Friday, with type of service (general care, specialty) varying by day. Urgent care is offered on a limited basis. Medical staff (medical doctors, provider assistants, nurse practitioners and medical residents) are mostly non-Native and participate in regular on-site cultural competency and proficiency training in the care of AI/ANs. Each year, approximately 7,000 patients receive medical care at this facility. Two-thirds of these patients are AI/AN, representing over 200 federally recognized tribes.

Participant eligibility criteria for the study were (i) at least 18 years of age; (ii) able to speak and read English; (iii) having made at least two previous visits to the health centre within the year prior to survey administration; and (iv) able to provide informed consent. Participants were recruited in the following ways. Upon check-in, patients presenting for general medicine clinic received an informational flyer about the study. At the end of their medical appointment, patients were invited to meet with the research staff to confirm eligibility criteria. Prior to data collection, informed consent was obtained, and all data collection methods and materials were administered in English. This study did not assess the type of care for which patients presented or restrict the two visits to the health centre to the same healthcare provider.

Participants received a $15 gift card to a local grocer. The privacy committee of the health centre, Institutional Review Boards of the Portland Area Indian Health Service, Portland State University, and the University of Colorado Denver, all provided approval to conduct this study, as well as for the study protocol.

Measures

Dependent variable

Patient activation, measured using the Patient Activation Measure (PAM) 13-item short form, was the outcome of interest (30). The short form has shown adequate reliability and validity in diverse groups (30–32). The PAM has been administered to AI/AN populations, although findings of these studies have not been published in peer-reviewed journals (Craig Swanson, PAM, personal communication). Within this sample, this scale exhibited excellent internal consistency, with a Cronbach's alpha coefficient of 0.91. The average inter-item correlation for these 13 items was 0.45. Example scale items included the following: 'When all is said and done, I am the person who is responsible for managing my health' and 'Taking an active role in health care is the most important factor in my health'. Participants responded to each item on a 4-point scale (1 = strongly disagree, 2 = moderately disagree, 3 = moderately agree and 4 = strongly agree) about statements referring to their role in their health care. Responses to all 13 items were averaged to produce an index of patient activation ranging from a minimum of 1 to a maximum of 4, with 1 indicating minimal patient activation and 4 indicating maximum patient activation.

Independent variables

Primary independent variables reflected factors that influence quality of care and thus included working alliance and patients' experiences of perceived provider weight bias in health care.

Working alliance was assessed using the Physician–Patient Working Alliance Scale (33), a 12-item inventory composed of three domains: goals of treatment, shared tasks needed to reach goals and emotional bond. The Physician–Patient Working Alliance Scale, adapted by Fuertes et al. (14), is based on Tracy and Kokotovic's short C-Working Alliance Inventory (34). It was developed to assess patients' perspectives on their relationship with their physician, and it has been shown to have excellent psychometric properties among a diverse sample of individuals (33). This scale had not been administered previously to AI/ANs. In this sample, this scale exhibited excellent internal consistency reliability, with a

Cronbach's alpha of 0.94; the average inter-item correlation for these 12 items was 0.56. A sample item from the scale was 'My doctor and I agree on my treatment plan'. Responses to questions ranged from 'strongly disagree' to 'strongly agree' (values of 1–5). One of the 12-scale items, 'My doctor and I have different ideas about my medical problems', was reverse coded prior to creating the scale, to ensure that higher scores reflected better outcomes. The index represents the average of all responses, with higher scores reflecting positive outcomes.

Perceived provider weight bias was assessed with a nine-item measure reflecting the frequency of patients' perceived negative interactions with their providers concerning their weight (35). This measure has been administered in a racially diverse sample (35), but to our knowledge has not previously been administered to AI/ANs. Within this sample, this scale exhibited excellent internal consistency reliability, with a Cronbach's alpha coefficient of 0.94, and the average inter-item correlation for these nine items was 0.64. Patients were asked a battery of questions, including 'When I lost weight and regained it, doctors criticized me for not trying harder' and 'Doctors have said critical or insulting things to me about my weight'. The measure was scored on a 5-point scale with the following response categories: 1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time and 5 = always. The responses to these items were averaged, and higher values reflect a higher level of perceived provider weight bias.

This study further examined the association of BMI with patient activation. Research staff measured height and weight on site, and BMI scores were used to create a dichotomous measure for patients with obesity, with those in the normal/average and overweight range (≤29.99) equal to 0 and those with class I–III (30.00–34.99) (≥30.00) equal to 1. Finally, to control for the effects of known covariates, this study included age (18–49, 50–64, 65 years or higher); gender (male or female); level of education (≤high school, high school graduate/GED, some college, college degree or higher); employment status (unemployed, employed part-time, employed full-time or retired); and marital status (married, living with partner, separated/divorced/widowed or never married).

Analysis

The initial sample included responses for 150 patients from different racial and ethnic backgrounds. To specifically target outcomes among the AI/AN respondents, analysis was limited to those patients who identified as such (n = 88). Analysis was further restricted to those

who provided valid responses on the variable of interest (patient activation), resulting in an analytic sample of 87. Bivariate associations between patient activation and co-variates were examined. Patient activation was then modelled using ordinary least squares regression. Patient activation is a numeric index; therefore, ordinary least squares regression was the appropriate technique for conducting analyses to assess the accuracy of working alliance and perceived provider weight bias in predicting patient activation. Patient activation levels may vary by obesity status, and prior literature has shown variations in the quality of the patient–provider relationship according to weight status (11,36). However, no significant interactions were detected. All analyses were performed using STATA 14.0 (StataCorp. 2017. *Stata Statistical Software: Release 15*. College Station, TX: StataCorp LLC).

Results

Descriptive statistics are reported in Table 1. The sample included a total of 87 AI/AN patients. Across these patients, the average level of patient activation was 3.30, which is a relatively high level. The mean working alliance score was 3.45 for the group (higher scores indicate a higher quality relationship with provider), while the mean level of perceived provider weight bias was 1.45 (meaning provider weight bias was rarely perceived among this group). Those with BMIs in the normal (20.00–24.99) to overweight (25.00–29.99) range represented 50% of the sample (*n* = 44). Those with BMIs of 30.00–34.99 represented 25% of the sample (*n* = 22), and those with BMIs of 35.00 or higher represented 25% of the sample; thus combined, this group represented 50% of the sample. Half (50%) of patients were in the lowest age category of 18–49 years. With respect to education, the largest percentage reported a high school level (39.77%). More than half reported being unemployed (52.67%). A greater percentage of female participants were represented overall (62.5%). Finally, the majority of patients reported being either widowed/divorced/separated or single (41.38% and 28.74%, respectively).

Table 2 presents the results of bivariate analyses of the relationship between the independent variables of interest and the dependent variable, patient activation. Both variables of interest, working alliance and perceived provider weight bias, evidenced significant correlations with the outcome. Specifically, working alliance had a strong, positive relationship with patient activation. In other words, higher (or better) scores on working alliance were associated with higher patient activation scores. On the other hand, a strong, negative correlation was observed between patients' perception of provider weight bias and patient activation. In fact, patients who perceived any

Table 1 Patient characteristics

Characteristic	AI/AN patients (*n* = 88)	
	Total	Missing
Quality of care		
Patient Activation Scale		1
Mean (standard deviation)	3.299 (0.577)	
Working Alliance Scale		0
Mean (standard deviation)	3.452 (0.656)	
Perceived weight bias		0
Mean (standard deviation)	1.446 (0.725)	
Perceived weight bias		0
Never	48.86%	
Rarely or more	51.14%	
BMI		0
Mean (standard deviation)	31.264 (6.648)	
BMI category		0
Normal/overweight (≤29.99 kg m^{-2})	50.00%	
Class I–III (≥30.00 kg m^{-2})	50.00%	
Demographic characteristics		
Age (years)		0
18–49	50.00%	
50–64	38.64%	
≥65	11.36%	
Education		0
<High school	25.00%	
High school	39.77%	
Some college	18.18%	
College degree, 2 years+	17.05%	
Employment status		0
Unemployed	52.67%	
Part-time	14.67%	
Full-time	6.67%	
Retired	26.00%	
Gender		0
Male	37.50%	
Female	62.50%	
Marital status		1
Married	11.49%	
Living with partner	18.39%	
Widowed, divorced, separated	41.38%	
Never married	28.74%	

AI/AN, American Indians and Alaska Native; BMI, body mass index.

level of weight bias from healthcare providers had significantly lower levels of patient activation (mean = 3.10) compared with those reporting that they never perceived any weight bias (mean = 3.50).

The results of the regression analyses are shown in Table 3. Model 1 presents the association of working alliance and perceived provider weight bias with patient activation; model 2 incorporates all covariates (BMI category, age, education level, employment status, gender and marital status). Here, it is observed that both working alliance and perceived weight bias evidence significant associations with patient activation. The full

Table 2 Patient activation by patient characteristics

Characteristic	Correlations		
	Correlation coefficient		p-value
Working Alliance Scale	0.418		<.001
Perceived weight bias	−0.296		0.005
BMI	0.530		0.621
	Patient activation scores		
	Mean	SD	p-value
Perceived weight bias			0.001
Never	3.504	0.421	
Rarely or more	3.098	0.639	
BMI category			0.799
Normal/overweight (≤29.99 kg m^{-2})	3.315	0.498	
Class I–III (≥30.00 kg m^{-2})	3.283	0.650	
Age (years)			0.004
18–49	3.456	0.513	
50–64	3.045	0.595	
≥65	3.485	0.503	
Education			0.414
Less than high school	3.304	0.657	
High school	3.198	0.659	
Some college	3.328	0.402	
College degree, 2 years+	3.497	0.331	
Employment			0.423
Unemployed	3.336	0.547	
Part-time	3.192	0.702	
Full-time	2.923	1.001	
Retired	3.345	0.488	
Gender			0.090
Female	3.218	0.612	
Male	3.438	0.489	
Marital status			0.110
Married	3.346	0.616	
Living with partner	3.149	0.754	
Widowed, divorced, separated	3.213	0.522	
Single	3.529	0.444	

Correlations coefficients are presented for associations between continuous covariates; mean values are presented for associations between categorical covariates and patient activation, with p-values reflecting results of F-tests.
BMI, body mass index; SD, standard deviation.

model (model 2) indicates that the impact of working alliance on patient activation retained significance despite the inclusion of covariates. Formally, after adjusting for other factors, a one-unit increase in working alliance score was associated with a 0.271-unit increase in the patient activation score. With respect to perceived provider weight bias, a significant negative association with patient activation was observed prior to adding covariates. Accordingly, a one-unit increase in perceived provider weight bias was associated with a −0.207-unit decrease in the patient activation score. However, this particular association was diminished to marginal significance with the inclusion of other factors ($p \leq 0.10$).

Among the sociodemographic characteristics, it was observed that age was associated with patient activation such that being in the middle age range was associated with decreased patient activation. The covariates were not significantly associated with patient activation.

Discussion

This study found that a favourable patient–provider relationship, as perceived by the patient and measured by working alliance, had a statistically significant and positive association with patient activation among this sample of AI/ANs. This finding was expected and is consistent with those reported previously among other groups (25). Therefore, positive patient–provider relationships may represent a promising means through which to increase patient activation among AI/ANs and improve their health outcomes. Indeed, one of the most important features of the patient–provider relationship is the concept of working alliance, a collaborative partnership that encompasses agreement on explicit goals of treatment and tasks, and the degree of trust and bonding (23,24). A strong working alliance is key to activating patients and fostering greater engagement in healthcare processes, including treatment adherence and retention (28–32). Some studies have shown that interpersonal factors that emerge during the medical encounter may strongly influence the extent to which patients adopt and sustain healthy behaviours for prevention, including secondary conditions of obesity (11,30). For example, our previous work among AI/ANs with type 2 diabetes who were participants in a cardiovascular risk reduction programme described the important role of a participatory medical model with regard to mitigating mistrust and promoting engagement and retention and discussed several culturally based strategies to ensure strong engagement and retention in health interventions that may be important to AI/ANs and useful for programmes that target other diverse populations as well (37). Currently, programmes to support patients towards activation and engagement are not well developed or are lacking in availability (24,38), and these resources are particularly scarce for AI/ANs. Therefore, future research into these issues is urgently needed.

To further understand associations between patient–provider interpersonal factors and patient activation, this study considered specific perceptions of provider weight bias according to patient experience. Patients' perceptions of provider weight bias in the patient–provider interaction were found to have a statistically significant negative association with patient activation, although the association was reduced to marginal significance with

Table 3 Estimated net effects of quality of care and covariates on patient activation scores

Characteristic	Model 1	Model 2
	Coefficient (confidence interval)	
Quality of care		
Working alliance score	0.327 (0.156, 0.498)***	0.271 (0.081, 0.460)**
Perceived weight bias	−0.207 (−0.389, −0.025)*	−0.169 (−0.351, 0.012)
BMI category (normal/overweight = reference)		
Class I–III (≥30.00 kg m^{-2})		−0.029 (−0.248, 0.190)
Sociodemographic characteristics		
Age (18–49 = reference)		
50–64		−0.359 (−0.600, −0.117)**
65 or more		0.120 (−0.246, 0.486)
Education (college degree or higher = reference)		
Less than high school		−0.103 (−0.444, 0.239)
High school		−0.294 (−0.601, 0.011)
Some college		−0.127 (−0.498, 0.245)
Employment status		
Unemployed		0.186 (−0.042, 0.414)
Gender		
Male		0.217 (−0.010, 0.444)
Marital status (widowed/divorced/separated = reference)		
Married		0.120 (−0.230, 0.471)
Living with partner		−0.156 (−0.462, 0.151)
Single		0.115 (−0.164, 0.394)
Missing		−0.387 (−1.422, 0.647)
Constant	2.461 (1.766, 3.157)***	2.744 (1.902, 3.587)***
Adjusted R^2	0.203	0.313

Model 1: working alliance and weight bias; model 2: all covariates (age, education, employment status, gender and marital status) added.
*$p \leq 0.05$.
**$p \leq 0.01$.
***$p \leq 0.001$.
BMI, body mass index.

the inclusion of covariates. Again, based on the published research, this finding was expected (11).

Nonetheless, exploring provider weight bias among AI/ANs promises to be a fruitful line of inquiry. The available evidence suggests that provider bias may influence treatment of patients with obesity and that patients' perceived experiences of provider weight bias may undermine patient engagement. For example, several studies show that people with obesity have low rates of weight-related counselling (12–17), are less likely to undergo age-appropriate preventive cancer screenings (12–15) and receive less time and less frequent intervention from medical providers in the clinical setting than patients without obesity (16,17). Among AI/ANs, weight bias in the context of health care has not been fully characterized. The one published study of these issues found that provider weight bias does not negatively contribute to the quality of care and obesity treatment for AI/AN patients (18). However, that study assessed weight bias from the point of view of the healthcare provider and not

from the perspective of the patient. AI/AN patients may also have unique concerns related to the level of culturally responsive care received from non-Native providers (37,39).

This study found that the perception of a positive overall relationship and the perception of provider weight bias can co-exist within the same patient–provider interaction. In our view, this finding warrants further examination, as it may have profound implications for healthcare and obesity interventions in the following ways. First, when patients with obesity report positive patient–provider relationships overall, providers and investigators may assume that weight bias was not experienced. The co-existence of perceived positive relationships and perceived weight bias in this study indicates that this may be a false assumption. The operation of perceived provider weight bias may be masked by patients' reports of positive patient–provider relationships, and the positive patient–provider relationship may not benefit patients with obesity in the way it benefits other patients –

especially patients who are classified as having severe obesity or being AI/AN and having obesity. This finding may be due to internalized weight bias among patients with obesity, which could lead those patients to mentally justify the weight-biased attitudes and negative assumptions they perceive coming from the healthcare provider and the medical neglect that may result. These findings may also apply to AI/ANs (40,41). The current understanding of these relationships remains undefined and deserves further clarification.

Finally, in this sample of AI/AN patients, it was observed that approximately half of the sample reported some level of perceived weight bias. It is important to note that these data were collected from a culturally centred healthcare programme that primarily serves AI/ANs, where providers have undergone cultural responsiveness training. This finding that approximately half of the patients reported some level of weight bias suggests that provider bias may be present even within a healthcare context that is positive in other ways. As such, this represents an area in need of improvement with respect to the development of models of culturally centred care.

Patients belonging to racial and ethnic minority groups may have unique concerns, arising not from isolated incidents but from structural inequities, that can be addressed by culturally responsive care (37). This may be particularly important in AI/AN healthcare settings, in which providers are typically non-Indian and serve AI/AN patients. Cross-racial and cross-cultural clinical encounters are part of a broader societal trend wherein AI/ANs navigate systems in which they possess less political, economic and social power. Similarly, issues of weight bias are macro-level issues that transcend the micro level of interpersonal interaction (17). Thus, examining the patient–provider relationship from a sociocultural perspective may help providers to cultivate stronger relationships with their patients and to understand how broader societal messages can be at work in patient experiences and healthcare decisions (22,37,39,42).

These findings recommend that providers and healthcare organizations consider how patient perceptions of provider weight bias may occur and how provider weight bias may be playing a role in working alliance and patient activation. Closer examination of provider weight bias in the healthcare setting may also elucidate barriers to addressing inequities that characterize the quality of health care for AI/ANs. Such information will be useful to inform the design of prevention and intervention programmes that are relevant to the healthcare experiences of AI/ANs and may be useful to help support patients towards activation for optimum obesity management and health improvement. Future work into

these issues may consider other fields such as mental health and diabetes, where the quality of the patient–provider interaction is well recognized as central to engagement processes and subsequent health outcomes (43–46).

The potential limitations of this study are as follows. First, an inherent limitation in a cross-sectional analysis is the inability to infer causality or temporality of associations. However, the results of these analyses align with prior work that suggests a positive association between working alliance and patient activation, and a negative association with weight bias, and thus contribute to the expanding body of literature documenting these associations. Second, there are possible limits to the generalizability of these findings. The study sample was drawn from a healthcare clinic, the services and resources of which may differ from those offered by other Indian healthcare facilities, such as smaller service units, programmes managed by the Indian Health Service and tribes and programmes located in rural areas. However, this study's analyses revealed relationships that were consistent with previously published studies of patient activation among non-AI/AN groups. Third, because data were collected from a convenience sample of patients, selection bias may influence reported outcomes. For example, the sample may over-represent patients able to take time after a medical appointment to participate in the study. Fourth, the design of the participant survey may further influence these findings. While the participants were recruited from general medical clinic days, the type of care patients were presenting for was not assessed; nor was the intersection between cultural differences and body size ideals and preferences among participants or their providers taken into account. Also, while the survey instructed participants to consider working alliance and weight bias with regard to their primary care provider, it is possible that respondents answered the items in reference to different types of providers they may have encountered, especially given the range of specialties offered at the participating healthcare facility. Finally, data were drawn from measures with previously unknown psychometric properties among diverse groups, including AI/AN populations. Additionally, the PAM-13 scale is lacking a neutral option for participants to consider, which may limit its ability to fully capture patient perceptions. However, the measures employed here exhibited acceptable validity and reliability consistent with prior studies. These findings contribute to the body of literature on research instruments that may be useful among AI/AN populations. Future research among AI/ANs may consider performing additional analyses to further examine the psychometric properties of the respective measures used in this study. Such information

will ameliorate a significant and persistent gap in the current understanding of their performance characteristics.

The findings reported herein suggest several opportunities for further investigation. Importantly, among a sample of AI/AN patients, the perception of a positive patient–provider relationship was associated with increased patient activation. The positive association of working alliance remained strong and statistically significant after adjustment for a number of covariates. Thus, a strong working alliance may represent an important means through which to improve the overall health of AI/AN populations. On the other hand, the perception of weight bias was associated with decreased patient activation (although the association was reduced to marginal significance with the inclusion of covariates). This study was limited by its smaller sample size, but given prior work documenting the importance of this factor and the fact that the association was approaching significance, this may merit more in-depth investigation. Although beyond the scope of these data, the presence of weight bias within a setting that has been designed to be culturally responsive suggests the importance of future research into the effect of weight bias on the patient–provider relationship, the possible role of internalized weight bias and the buffering influence of culturally responsive care. These findings further substantiate and support broader calls to reduce weight bias among healthcare professionals (47), the need to develop evidence-based obesity interventions that do not encourage weight bias (48), and to understand the role of internalized weight bias and culturally responsive care.

Conflict of Interest Statement

There is no conflict of interest for any of the authors of this manuscript.

Acknowledgements

Funding

References

1. Yang L, Colditz GA. Prevalence of overweight and obesity in the United States, 2007–2012. *JAMA Intern Med* 2015; **175**: 1412–1413.

2. Broussard B, Johnson A, Himes J, et al. Prevalence of obesity in American Indians and Alaska Natives. *Am J Clin Nutr* 1991; **53**: 1535S–1542S.

3. Welty T. Health implications of obesity in American Indians and Alaska Natives. *Am J Clin Nutr* 1991; **53**: 1616S–1620S.

4. Howard BV, Lee ET, Cowan LD, et al. Rising tide of cardiovascular disease in American Indians: the strong heart study. *Circulation* 1999; **99**: 2389–2395.

5. Welty TK, Lee ET, Yeh J, et al. Cardiovascular disease risk factors among American Indians. *Am J Epidemiol* 1995; **142**: 269–287.

6. Allison DB, Downey M, Atkinson RL, et al. Obesity as a disease: a white paper on evidence and arguments commissioned by the Council of the Obesity Society. *Obesity* 2008; **16**: 1161–1177.

7. Johnson DB, Gerstein DE, Evans AE, Woodward-Lopez G. Preventing obesity: a life cycle perspective. *J Am Diet Assoc* ; **106**: 97–102.

8. Booth HP, Prevost TA, Wright AJ, Gulliford MC. Effectiveness of behavioural weight loss interventions delivered in a primary care setting: a systematic review and meta-analysis. *Fam Pract* 2014; **31**: 643–653.

9. Gittelsohn J, Rowan M. Preventing diabetes and obesity in American Indian communities: the potential of environmental interventions. *Am J Clin Nutr* 2011; **93**: 1179S–1183S.

10. Alegria M, Polo A, Gao S, et al. Evaluation of a patient activation and empowerment intervention in mental health care. *Med Care* 2008; **46**: 247–256.

11. Phelan SM, Burgess DJ, Yeazel MW, Hellerstedt WL, Griffin JM, van Ryn M. Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obes Rev* 2015; **16**: 319–326.

12. Burgess DJ, Warren J, Phelan S, Dovidio J, van Ryn M. Stereotype threat and health disparities: what medical educators and future physicians need to know. *J Gen Intern Med* 2010; **25**: 169–177.

13. Nápoles AM, Chadiha LA. Advancing the science of recruitment and retention of ethnically diverse populations. *Gerontologist* 2011; **51**: S142–S146.

14. Link B, Hatzenbuehler ML. Stigma as an unrecognized determinant of population health: research and policy implications. *J Health Polit Policy Law* 2016; **41**: 653–673.

15. Teachman BA, Brownell KD. Implicit anti-fat bias among health professionals: is anyone immune? *Int J Obes Relat Metab Disord:*

Journal of the International Association for the Study of Obesity 2001; **25**: 1525–1531.

16. Schwartz MB, Chambliss HO, Brownell KD, Blair SN, Billington C. Weight bias among health professionals specializing in obesity. *Obes Res* 2003; **11**: 1033–1039.

17. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J Public Health* 2010; **100**: 1019.

18. Sabin JA, Moore K, Noonan C, Lallemand O, Buchwald D. Clinicians' implicit and explicit attitudes about weight and race and treatment approaches to overweight for American Indian children. *Child Obes* 2015; **11**: 456–465.

19. James J. Health policy brief: patient engagement. *Health Aff* 2013: 1–6.

20. Hibbard JH, Mahoney E. Toward a theory of patient and consumer activation. *Patient Educ Couns* 2010; **78**: 377–381.

21. Gonzales KL, Noonan C, Goins RT, et al. Assessing the everyday discrimination scale among American Indians and Alaska Natives. *Psychol Assess* 2015; **28**: 51–58.

22. Gonzales KL, Lambert WE, Fu R, Jacob M, Harding AK. Perceived racial discrimination in health care, completion of standard diabetes services, and diabetes control among a sample of American Indian women. *Diabetes Educ* 2014; **40**: 747–755.

23. Johansson P, Jacobsen C, Buchwald D. Perceived discrimination in health care among American Indians/Alaska Natives. *Ethn Dis* 2006; **16**: 766–771.

24. Hibbard JH, Mahoney ER, Stock R, Tusler M. Do increases in patient activation result in improved self-management behaviors? *Health Serv Res* 2007; **42**: 1443–1463.

25. Wong ST, Peterson S, Black C. Patient activation in primary healthcare: a comparison between healthier individuals and those with a chronic illness. *Med Care* 2011; **49**: 469–479.

26. Alegria M, Sribney W, Perez D, Laderman M, Keefe K. The role of patient activation on patient–provider communication and quality of care for US and foreign born Latino patients. *J Gen Intern Med* Nov 2009; **24**: 534–541.

27. Beebe C. Patient activation: a primary care tool to tackle overweight and obesity. *Clin Diabetes* 2015; **33**: 167–168.

28. Greene J, Hibbard JH, Sacks R, Overton V, Parrotta CD. When patient activation levels change, health outcomes and costs change, too. *Health Aff* 2015; **34**: 431–437.

29. Hibbard JH, Greene J. What the evidence shows about patient activation: better health outcomes and care experiences; fewer data on costs. *Health Aff* 2013; **32**: 207–214.

30. Hibbard JH, Mahoney ER, Stockard J, Tusler M. Development and testing of a short form of the Patient Activation Measure. *Health Serv Res* 2005; **40**: 1918–1930.

31. Fowles JB, Terry P, Xi M, Hibbard J, Bloom CT, Harvey L. Measuring self-management of patients' and employees' health: further validation of the Patient Activation Measure (PAM) based on its relation to employee characteristics. *Patient Educ Couns* 2009; **77**: 116–122.

32. Skolasky RL, Green AF, Scharfstein D, Boult C, Reider L, Wegener ST. Psychometric properties of the Patient Activation Measure among multimorbid older adults. *Health Serv Res* 2011; **46**: 457–478.

33. Fuertes. The physician–patient working alliance. *Patient Educ Couns* 2007; **66**: 29–36.

34. Tracey TJ, Kokotovic AM. Factor structure of the working alliance inventory. *Psychol Assessment: A journal of consulting and clinical psychology* 1989; **1**: 207–210.

35. Wadden TA, Anderson DA, Foster GD, Bennett A, Steinberg C, Sarwer DB. Obese women's perceptions of their physicians' weight management attitudes and practices. *Arch Fam Med* 2000; **9**: 854–860.

36. Gudzune KA, Bennett WL, Cooper LA, Bleich SN. Patients who feel judged about their weight have lower trust in their primary care providers. *Patient Educ Couns* 2014; **97**: 128–131.

37. Jacob M, Poole M, Gonzales K, Jim H, Duncan G, Manson S. Exploring an American Indian participatory medical model. *J Participat Med* 2015; **7**: e8.

38. Frosch DL, Elwyn G. I believe, therefore I do. *Journal of General Internal Medicine* 2011; **26**: 2–4.

39. Simonds VW, Christopher S, Sequist TD, Colditz GA, Rudd RE. Exploring patient–provider interactions in a Native American community. *J Health Care Poor Underserved* 2011; **22**: 836–852.

40. Manson SM, Jiang L, Zhang L, Beals J, Acton KJ, Roubideaux Y. Special diabetes program for Indians: retention in cardiovascular risk reduction. *Gerontologist* 2011; **51**: S21–S32.

41. Moore K, Jiang L, Manson SM, et al. Case management to reduce cardiovascular disease risk in American Indians and Alaska Natives with diabetes: results from the special diabetes program for Indians healthy heart demonstration project. *Am J Public Health* 2014; **104**: e158–e164.

42. Gonzales KL, Harding AK, Lambert WE, Fu R, Henderson WG. Perceived experiences of discrimination in health care: a barrier for cancer screening among American Indian women with type 2 diabetes. *Womens Health Issues* 2013; **23**: e61–e67.

43. Burgess DJ, Taylor BC, Phelan S, et al. A brief self-affirmation study to improve the experience of minority patients. *Appl Psychol Health Well Being* 2014; **6**: 135–150.

44. Yang LH, Kleinman A, Link BG, Phelan JC, Lee S, Good B. Culture and stigma: adding moral experience to stigma theory. *Soc Sci Med* 2007; **64**: 1524–1535.

45. Weiss MG, Ramakrishna J, Somma D. Health-related stigma: rethinking concepts and interventions 1. *Psychol Health Med* 2006; **11**: 277–287.

46. Schabert J, Browne JL, Mosely K, Speight J. Social stigma in diabetes. *The Patient-Patient-Centered Outcomes Research* 2013; **6**: 1–10.

47. Alberga A, Pickering B, Alix Hayden K, et al. Weight bias reduction in health professionals: a systematic review. *Clin Obes* 2016; **6**: 175–188.

48. Rueda-Clausen C, Benterud E, Bond T, Olszowka R, Vallis M, Sharma A. Effect of implementing the 5As of obesity management framework on provider–patient interactions in primary care. *Clin Obes* 2014; **4**: 39–44.