

# Social marketing meets health literacy: Innovative improvement of health care providers' comfort with patient interaction

Brian A. Primack<sup>a,b,d,\*</sup>, Thuy Bui<sup>a,b</sup>, Carl I. Fertman<sup>c</sup>

<sup>a</sup> Division of General Internal Medicine, Department of Medicine, School of Medicine, University of Pittsburgh, Pittsburgh, PA, United States

<sup>b</sup> Center for Research on Health Care, University of Pittsburgh, Pittsburgh, PA, United States

<sup>c</sup> Department of Health and Physical Activity, School of Education, University of Pittsburgh, Pittsburgh, PA, United States

<sup>d</sup> Division of Adolescent Medicine, Department of Pediatrics, School of Medicine, University of Pittsburgh, Pittsburgh, PA, United States

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## Abstract

**Objective:** It is essential to train health care providers to deliver care sensitive to the needs of diverse individuals with varying degrees of health literacy. We aimed to evaluate an innovative, theory-based, educational intervention involving social marketing and health literacy.

**Methods:** In 2006 at a large medical school, all first-year students were exposed to the intervention. They completed pre- and post-test anonymous surveys including demographic data, covariates, and key outcome variables. Paired *t*-tests and multiple linear regression were used to evaluate the intervention and to determine independent associations among the key outcome variables.

**Results:** Post-intervention scores were significantly higher than pre-intervention scores for social marketing (3.31 versus 1.90,  $p < 0.001$ ), health literacy (3.41 versus 2.98,  $p < 0.001$ ), and comfort in brochure development (3.11 versus 2.52,  $p < 0.001$ ) ( $N = 83$ ). After controlling for demographic and covariate data, health literacy and comfort in brochure development were independent predictors of comfort interacting with diverse populations.

**Conclusion:** A brief intervention involving social marketing and health literacy can improve skills that improve medical students' comfort with patients of diverse backgrounds.

**Practice implications:** Health care providers can be taught educational principles and skills involved in developing effective patient education materials. These skills may improve providers' comfort with direct patient interaction.

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**Keywords:** Social marketing; Health literacy; Patient interaction; Community health; Patient education; Cultural competency; Medical student education; Patient-physician communication; Racial/ethnic diversity

## 1. Introduction

Health literacy – the degree to which individuals obtain, process, and understand basic health information and services needed to make appropriate health decisions [1] – is now recognized as a critical determinant of health care outcomes and health care costs [2]. In the United States, nearly 90 million people are considered to have limited health literacy [2], and their increased rates of hospitalization and emergency services utilization [3–5] may lead to as much as US\$ 69 billion in avoidable health care costs each year [6]. Poor health literacy is

an equally substantial concern in the international arena [7]. Although the Institute of Medicine indicates that it is essential for medical schools to train physicians and other health care providers to deliver competent care that is sensitive to the needs of individuals with limited health literacy and differing cultural backgrounds [2], there is no standardized approach for doing so [8–10].

Social marketing may provide an innovative and compelling framework for teaching medical students to be sensitive to the needs of patients with different degrees of health literacy and diverse backgrounds [11–13]. Social marketing uses concepts from commercial marketing (Table 1) to inform the planning and implementation of health promotion programs. With regard to the development of a patient education program or brochure, for instance, social marketing experts would consider key elements of the background, abilities, and desires of a particular

\* Corresponding author at: 230 McKee Place #600, Pittsburgh, PA 15213, United States. Tel.: +1 412 586 9789; fax: +1 412 692 4838.

E-mail address: bprimack@pitt.edu (B.A. Primack).

Table 1  
The five primary elements of social marketing

Element	Description
Product	Explicit definition of the desired health behavior as an “item” to be “purchased”
Person	Careful analysis of the “target audience” of the message, considering the audience’s demographic and psychological characteristics, including age, gender, race/ethnicity, socioeconomic status, and “stage of change” with regard to a chosen health behavior
Price	Consideration of the resistance to change and the particular barriers between the person and the product, with subsequent promotional attempts to minimize this “price”
Place	Creative choice of placement of messages to maximize exposure of the target audience to the promotional messages
Promotion	Use of specific strategies to engender the specific healthy lifestyle (“product”) chosen, including consideration of what types of pictures, phrases, fonts, ideas, formats, and related elements will be most successful given the objective and the target audience

group of patients in their efforts to “market” a specific health-related outcome to this “target audience”. We therefore hypothesized that a theory-based educational intervention in which medical students used principles of social marketing to design a health education brochure for a specific audience would advance our educational objectives: the medical students’ (1) knowledge of social marketing, (2) knowledge of health literacy, and (3) comfort with developing a health education brochure for patients of diverse backgrounds. The first aim of our study was to test this hypothesis.

The second aim of our study was to test the hypothesis that improvements in each of the three constructs of our first hypothesis (social marketing, health literacy, and comfort with brochure development) would be associated with increased comfort interacting with patients of diverse backgrounds. We hypothesized that this would be true even when controlling for relevant covariates, such as age, gender, and previous experience in health care settings—whether that experience was from the perspective of caring for patients or being a patient. To test our hypotheses, we designed a study instrument to be used in conjunction with a brief, theory-based educational intervention for medical students at a large urban university.

## 2. Methods

### 2.1. Participants and setting

With approval from the Institutional Review Board of the University of Pittsburgh, we recruited medical students from the Clinical Experiences Course at the University to participate in our study from January to April 2006.

The Clinical Experiences Course, which is required of all first-year medical students, is designed to be an introduction to clinical medicine. It involves 2 months of primary care office experience and 1 month of a community-based service-learning experience. Students are given a short set of didactic lectures at the beginning and at the end of the course. Our intervention consisted of 2 didactic sessions of one hour each and a required longitudinal project integrated into this course.

### 2.2. Intervention curriculum

During the first didactic session of the intervention, in a 1 h lecture we described the principles of social marketing and illustrated how these principles could be used effectively to

develop a health education brochure for individuals with low health literacy. We then asked each student to develop a patient education brochure as a long-term project. The brochure could focus on a topic of their choice, preferably a topic of relevance to their 3-month clinical experience. We allowed students to choose their own topics to improve their intrinsic motivation for the project and to reflect the rich diversity of student interests. Each completed patient education brochure was required to be accompanied by a two-page informational cover sheet outlining how the student used each of the five principles of social marketing in developing key aspects of the brochure. The students were also required to include relevant demographic and behavioral information on this cover sheet concerning the “target market” of the brochure. During the closing didactic session, we reviewed the principles of social marketing and health literacy and displayed examples of particularly successful student brochures. This overall curriculum was guided by the three guiding educational objectives of the intervention: (1) to improve knowledge of principles of social marketing; (2) to improve knowledge of health literacy; (3) to improve students’ comfort developing patient education materials. Ultimately, we also aimed in the long-term to improve a fourth educational objective: comfort interacting with patients of diverse backgrounds.

### 2.3. Procedures

We invited all 147 students enrolled in the first year medical school class to participate in our study by completing a self-administered survey at the beginning of the course and completing an identical survey at the end of the course. Students were informed of the purpose of the data collection. We indicated that the surveys contained no unique identifying information and that students would receive no reward or penalty for completing them and returning them to a dropbox. Thus, only the students who wanted to participate in the study completed the surveys.

### 2.4. Study instrument

Our survey measured demographics, covariates, and items concerning our four constructs of interest. Demographics included date of birth and gender. We were able to use these demographic data to match students’ pre- and post-tests without having to obtain unique identifiers. Other covariates included

students' self-reported previous experience caring for patients (for instance, by volunteering in an emergency room before attending medical school) and previous experience in the role of a patient. We also developed 17 items measuring our four constructs of interest: (1) knowledge of social marketing; (2) knowledge of health literacy; (3) comfort with developing a health education brochure for patients of diverse backgrounds ("brochure comfort"); (4) comfort in interacting with patients of diverse backgrounds ("patient comfort"). Each item asked for a response on a 4-point Likert scale (Strongly Disagree/Disagree/Agree/Strongly Agree). To help insure reliability and content validity of these items, we incorporated or adapted items and constructs from the most recent Cross-Cultural Counseling Inventory [14] and from earlier models of health literacy and social marketing [2,15]. We also pilot-tested the items and made alterations based on input from experts.

### 2.5. Factor analysis and scale reliability

We performed exploratory factor analysis with varimax rotation on the 17 items measuring the constructs of interest to determine the underlying factor structure produced by these items (Table 2) [16]. This analysis revealed a strong four-factor solution with eigenvalues of 6.9, 3.0, 1.7 and 1.5 explaining 77% of the variance in the data. Only one item (item 9) was dropped because it did not fit clearly into any one particular factor. The 4 social marketing items loaded strongly on factor 1; the 3 health literacy items loaded strongly on factor 4; the 5 brochure comfort items loaded strongly on factor 2; the 4

patient comfort items loaded strongly on factor 3. When we computed Cronbach's alpha for the four subscales, we found that each had good to excellent internal consistency: 0.98 for social marketing, 0.66 for health literacy, 0.90 for brochure comfort, and 0.89 for patient comfort.

### 2.6. Analysis

We first matched students' pre- and post-tests using date of birth and gender, and we only included matched data in the analyses. We did this instead of collecting names or unique identifiers because anonymity was crucial for obtaining high-quality data. Many of the items included in the survey were of a sensitive nature (e.g., an item asked students to respond to the statement "I feel comfortable taking care of a patient of a different race than me"), and students may not have been honest if they believed they could be easily identified. In order to determine if there was selection bias, we used *t*-tests to compare demographic and experiential data on those included in the analysis (those with both pre- and post-test data) and those excluded from the analysis (those with incomplete data).

To determine whether the brief educational intervention improved students' knowledge of social marketing and health literacy and their comfort with brochure development, we calculated the mean scores for the social marketing, health literacy, and brochure comfort subscales in surveys taken by study participants before and after the intervention. We used paired *t*-tests to compare the pre-intervention and post-intervention results.

Table 2  
Items and factor loadings

Item <sup>a</sup>	Factor 1 loading	Factor 2 loading	Factor 3 loading	Factor 4 loading
1 I feel comfortable using the principles of social marketing	<b>0.91<sup>b</sup></b>	0.04	0.18	0.05
2 I understand the social marketing concept of "person"	<b>0.96</b>	0.08	0.20	0.08
3 I understand the social marketing concept of "place"	<b>0.96</b>	0.06	0.19	0.07
4 I understand the social marketing concept of "price"	<b>0.96</b>	0.06	0.17	0.09
5 I can design a good patient education brochure	0.35	0.11	<b>0.74</b>	0.15
6 I can design patient education materials for those with a different race or ethnicity than me	0.24	0.20	<b>0.85</b>	0.04
7 I can design patient education materials for those with a different gender than me	0.19	0.19	<b>0.88</b>	0.00
8 I can design patient education materials for people of a different socioeconomic status than me	0.26	0.15	<b>0.86</b>	0.09
9 I know how to assess the reading level of a health education material <sup>c</sup>	0.56	0.09	0.46	0.17
10 I feel comfortable working directly with patients	0.11	<b>0.77</b>	0.19	0.09
11 I feel comfortable working with patients with poor reading skills	0.25	<b>0.62</b>	0.36	-0.02
12 I feel comfortable working with patients who are of a different race or ethnicity than me	0.02	<b>0.91</b>	0.10	0.01
13 I feel comfortable working with patients of a different gender than me	0.01	<b>0.90</b>	0.11	0.07
14 I feel comfortable working with patients with different socioeconomic status than me	0.10	<b>0.85</b>	0.18	0.15
15 On average, over half of the patients I will see during medical school will have poor health literacy	0.07	0.15	-0.05	<b>0.80</b>
16 Improving patients' health literacy would save the health care system a lot of money	0.19	0.10	0.21	<b>0.71</b>
17 Most Americans do not understand even very basic information about health	0.18	0.06	0.14	<b>0.72</b>

Items 1–4 formed the social marketing (SM) scale Cronbach's alpha = 0.98; items 5–8 formed the brochure comfort (BC) scale, Cronbach's alpha = 0.91; items 10–14 formed the patient comfort (PC) scale, Cronbach's alpha = 0.89; items 15–17 formed the health literacy (HL) scale, Cronbach's alpha = 0.66.

<sup>a</sup> Each item was measured with a 4-point Likert scale (Strongly Disagree/Disagree/Agree/Strongly Agree).

<sup>b</sup> Bold loadings were >0.60 and were considered significant.

<sup>c</sup> Because item 9 did not load on any one particular factor, it was not included in any scale.

To determine whether the social marketing, health literacy, and/or brochure comfort scores were predictors of patient comfort scores, we used linear regression. We first conducted simple linear regressions on patient comfort with the covariates (age, gender, experience caring for patients, experience being a patient) and the constructs of interest (social marketing, health literacy, and brochure comfort) as respective independent variables. We then used multiple linear regression with patient comfort as the dependent variable and all the other variables as independent variables. In order to avoid including redundant, correlated data, these regressions were conducted on only the post-intervention responses of the students included in the analysis.

### 3. Results

Of the 147 first year medical students in the course, 128 (87%) returned pre-tests and 101 (69%) returned post-tests. Of all enrolled students, 83 (57%) returned both pre- and post-intervention surveys. Compared with the students who were present for both the pre-test and the post-test, those who were present for only one (and were therefore excluded from the analysis) were no different in terms of age ( $p = 0.13$ ), gender ( $p = 0.84$ ), experience caring for patients ( $p = 0.36$ ), or experience being a patient ( $p = 0.59$ ).

Mean scores and ranges for the survey subscales are shown in Table 3. *t*-Tests showed that mean post-intervention scores were significantly higher than mean pre-intervention scores for social marketing (3.31 versus 1.90;  $p < 0.001$ ), health literacy (3.41 versus 2.98;  $p < 0.001$ ), and brochure comfort (3.11 versus 2.52;  $p < 0.001$ ).

Simple linear regressions with patient comfort as the dependent variable showed that knowledge of health literacy ( $p = 0.016$ ) and comfort making a health education brochure ( $p = 0.004$ ) each had a significant linear relationship with patient comfort (Table 3). Age, gender, experience caring for patients, experience being a patient, and social marketing were not significantly related to patient comfort. Previous experience caring for patients had a linear relationship with comfort with patients approaching significance ( $p = 0.071$ ). Multiple linear regression showed that health literacy and brochure comfort

Table 3

Changes in social marketing, health literacy, and brochure comfort pre- and post-intervention

Scale	Pre-intervention	Post-intervention	<i>t</i>	<i>p</i>
Social marketing scale, 1–4	1.90	3.31	15.05	<0.001
Health literacy scale, 1–4	2.98	3.41	6.26	<0.001
Brochure comfort scale, 1–4	2.52	3.11	6.97	<0.001

These analyses were conducted using paired *t*-tests on the 83 individuals for whom both a pre-test and a post-test was available.

retained their significant linear relationship with patient comfort, even in the fully adjusted model (Table 4).

### 4. Discussion and conclusion

#### 4.1. Discussion

In our study, we found that medical students' knowledge of social marketing and health literacy and their comfort developing a health education brochure for patients of diverse backgrounds were all significantly increased after they were exposed to a theory-based intervention consisting of 2 h of didactic material and a longitudinal assignment. We also found that, among students post-intervention, knowledge of health literacy and comfort with brochure development were independent predictors of comfort with patient interaction, even after controlling for demographic and experiential data.

Although we did not have a control group, we feel confident that the changes noted regarding self-reported comfort with social marketing, health literacy, and brochure development were in fact as a result of the intervention. This is because these topics were not emphasized in other curricular components during the period of study. Students were, however, enrolled in a course (the Clinical Experiences Course) which may have affected their overall comfort with patients. It is for this reason that we choose not to report students' self-reported improvement in comfort with diverse patient interaction, which could have been due to either our intervention or other curricular components.

Table 4  
Bivariate and multivariate linear regression analyses on the patient comfort scale

	Bivariate analyses <sup>a</sup>			Multivariate analyses <sup>b</sup>		
	Coefficient	<i>t</i>	<i>p</i>	Coefficient	<i>t</i>	<i>p</i>
Age (years)	0.00	0.51	0.613	0.0057	0.35	0.726
Gender, male	−0.12	−1.13	0.261	−0.099	−0.94	0.348
Experience being a patient, 1–4	−0.033	−0.57	0.569	−0.058	−0.92	0.362
Experience caring for patients, 1–4	0.129	1.83	0.071	0.122	1.69	0.095
Social marketing scale, 1–4	0.202	1.63	0.106	−0.067	−0.44	0.664
Health literacy scale, 1–4	0.305	2.45	0.016 <sup>‡</sup>	0.268	2.01	0.048 <sup>‡</sup>
Brochure comfort scale, 1–4	0.396	2.95	0.004 <sup>‡</sup>	0.347	2.26	0.027 <sup>‡</sup>

<sup>a</sup> For these separate analyses, the patient comfort scale was the dependent variable and each of the other variables was the independent variable, respectively.

<sup>b</sup> For this analysis, the patient comfort scale was the dependent variable and all variables were included as independent variables simultaneously.

<sup>‡</sup>  $p < 0.05$ .

Table 5  
Brochures selected for professional production and community dissemination

Brochure title	Health topic addressed (product)	Target audience (person)	Location for which material was designed (place)	Barriers brochure attempts to reduce (price)	Promotional strategy (promotion)
Can You Hear Me?	Hearing loss due to personal audio devices	Sensation seeking adolescent males (12–21)	Popular music store in particularly “hip” neighborhood of Pittsburgh	The sense that listening to music less loudly is not desirable	Compelling photographs of musical artists similar to those admired by sensation seeking youth; quotations from famous rock musicians on hearing loss
Livin’ la Vida con Vacunas	Early childhood vaccination	Hispanic women who are likely to be parents of young children (21–35)	On the waiting room table at a particular Spanish speaking clinic in Pittsburgh	Distrust of medical establishment; Concerns about the potential harm of vaccinations	Spanish language; photographs and graphics of happy Latino children and infants; graphic of child being supported by parents
Real Men Wear Helmets	Head injury due to motorcycle accidents	Risk-taking young adult males (18–24)	A motorcycle dealership in Pittsburgh	The notion that wearing a helmet is not comfortable or that it restricts vision, hearing, or “freedom”	Photos of rugged risk-taking males such as football players; cheeky adolescent-type humor; black and gold coloring of titles to suggest the Steelers; quotation from Steelers quarterback Ben Roethlisberger regarding regret over his motorcycle injury
Sister to Sister: The Truth about Sex	Healthy reproductive habits (such as limiting partners, protecting against STI’s)	African-American female adolescents (12–18)	Community center in urban African-American area of Pittsburgh	The belief that even casual sexual experiences are not associated with substantial risk and/or complexity.	Simplified “5 to survive” graphic emphasizing 5 simple points regarding healthy reproductive habits; photo of attractive young African American woman with basketball suggesting she is in control; purple color highlights
Summer Fun and Safety with Your Kids	Sunburn, skin cancer	Young fair-skinned parents, primarily women (25–40)	A community play center in the basement of a church with primarily Caucasian membership	The belief that sun protection is inconvenient, expensive, and not fun	Comes with a small pencil to play game on the back in which parents and kids together fill in word games related to sun safety; printed on non-glossy paper that can be easily written on
Want to Make the Most of Your Office Visit?	Enhancement of patient-provider communication	General internal medicine patients aged 50–70 with multiple complaints	The waiting room of the University General Internal Medicine practice	The idea that the doctor is too busy to deal with multiple complaints; the sense that certain complaints are “off limits” or not worth mentioning (such as erectile dysfunction or incontinence)	Comes with a small pencil to fill out pre-visit lists of questions and concerns for the doctor; also has specified space for doctor’s instructions to be written down; printed on non-glossy paper that can be easily written on; fun and soothing graphics to assuage anxiety
When Illness Threatens Your Life	Communication regarding preferences in end of life care	Patients and family members with the diagnosis of cancer (patients generally aged 60+)	To be given by oncologists at the Pittsburgh Cancer Institute during visits when diagnosis of cancer is made	Notion that cancer treatment is highly “medicalized” and results in powerlessness for the patient	Artwork involves beautiful photographs of flowers rather than a clinical situation such as a doctor in a lab coat; linguistic emphasis is on the patient’s power and autonomy: “Your Choices,” “Your Values”

This does not diminish the results of the regression analyses, however, which suggest that ultimate comfort with diverse patient interaction is independently associated with both knowledge of health literacy and comfort developing patient education brochures. Although we cannot assume causality from a cross-sectional study, it is valuable to know that these constructs do seem to be linked. The importance of the finding that health literacy and brochure comfort were independent predictors of patient comfort is underscored by the fact that other demographic and experiential variables were not significantly related to the outcome. Most notably, even previous experience caring for patients prior to medical school was not independently associated with ultimate comfort caring for diverse patients.

It is interesting that the regression analyses indicate that knowledge of social marketing itself was not an independent predictor of patient comfort. Social marketing appeared to provide a creative and valuable framework for this program. However, to best increase the students' ultimate comfort with patients of diverse backgrounds, these results suggest that it may be most efficient to focus – as far as content is concerned – on the principles of health literacy and on improving students' comfort with developing educational materials.

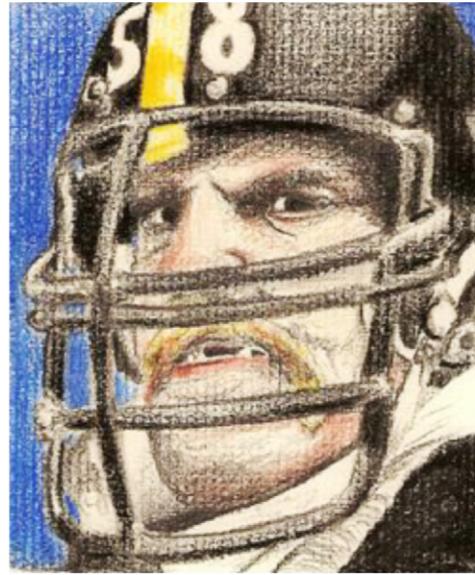
These findings suggest that brief and inexpensive educational interventions such as ours can be effective in improving key variables that may be related to students' comfort in interacting with a diverse cohort of patients, which is essential for meeting the Institute of Medicine's goal of training health care providers to provide competent care that is sensitive to the needs of individuals with limited health literacy and differing cultural backgrounds [2]. Especially since this intervention was not costly in terms of time and/or funds, it clearly merits further pilot implementation and further study. A next step may be to randomize groups of medical students to social marketing related versus standard interventions and compare the groups regarding key outcomes related to patient-provider relationship and communication.

The intervention featured additional “value added” worth noting. Specifically, a tangible outcome of the implementation aside from the students' improved knowledge and self-reported comfort were the actual 147 health education brochures that the students produced. The next phase of this project will involve professional production of several outstanding student projects and their dissemination and evaluation in the community (Table 5, Fig. 1). Projects such as this, with tangible products, can be valuable not only because they have educational value but also because their products can be creatively used in community settings.

Finally, we believe that the measurement instruments developed in this project contribute to the literature. Specifically, our factor analysis and subsequent reliability testing helped to hone scales measuring constructs important to the field of patient education and counseling. These scales could be of use in future studies.

Our study had limitations worth noting. First, it involved only one large medical school. Although our student population has a racial/ethnic profile similar to that of other medical schools, it may be useful to test the findings in other health care

## Are you calling him a sissy?



**Football players. Construction workers.  
Soliders. Firefighters. NASCAR drivers.**

Fig. 1. Example brochure graphic. This graphic is from the brochure entitled “Real Men Wear Helmets.” Despite clear evidence that helmet use reduces morbidity and mortality from motorcycle accidents, Pittsburgh currently has no law requiring helmet use. This brochure was designed to encourage young, sensation seeking males who purchase motorcycles to wear helmets. The brochure uses compelling pencil-made renditions of extremely masculine men wearing helmets in various settings in order to reduce the sense that wearing a helmet is for “sissies.” The brochure uses a black and gold color scheme since members of the target market are likely to be fans of the Pittsburgh Steelers. Finally, it creatively uses adolescent-style humor deemed to be preferred by the target market. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of the article.)

provider trainees, such as nurses and pharmacists. Second, our outcomes were self-reported, and self-evaluations can be biased. However, in the context of this study we feel that the outcomes were appropriate, since the purpose of this study was to assess the impact of the intervention on student perceptions. Finally, those students with complete data represented 57% of those eligible. Although we would prefer even higher response rates, this is a strong response rate for a medical school where attendance is not taken, where all didactic material is available on the school intranet, and where therefore many students choose not to attend class routinely. Furthermore, we performed analyses showing that those students not included in the final analysis were no different than those included in terms of key demographic and experiential data, strengthening the generalizability of our findings.

### 4.2. Conclusion

In conclusion, our study demonstrated that, after a brief and inexpensive intervention, medical students can show measurable improvement in their understanding of social marketing and health literacy, as well as their comfort in developing patient education materials for patients. Furthermore, their self-reported

comfort in dealing with patients of diverse backgrounds was independently associated with their knowledge of health literacy and their comfort developing brochures. This project may therefore represent an important step toward achieving the goal of improving medical students' care of diverse populations.

#### 4.3. Practice implications

These findings have implications for (1) professionals who train those who will be counseling patients and (2) those who provide direct patient education counseling. The results of the study suggest that those who train health care practitioners may wish to incorporate similar curricula to ours in order to improve trainees' comfort with patient education counseling. The results imply that in particular the acquisition of knowledge of health literacy and comfort developing patient education brochures may be able to transfer to the personal encounter. Additionally, those involved in training health care providers can use these measures, which have demonstrated reliability and face validity, in the assessment of their programs. The results also imply that those who provide direct counseling services to patients may find it useful to integrate the principles of social marketing and health literacy into how they think about the individual patient encounter. In particular, this framework may give them a useful framework within which to best "market" a particular "product" (health behavior) to a particular "target audience" with unique needs and potentially limited health literacy.

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