Title

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Journal

Journal of Drug Issues, 47(3)

ISSN

0022-0426

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Publication Date

2017-07-01

DOI

10.1177/0022042617699196

Peer reviewed

Journal of Drug Issues
1–15

DOI: 10.1177/0022042617699196
jod.sagepub.com
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Addiction Treatment Clients' Reactions to Graphic Warning Labels on Cigarette Packs

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Abstract

Graphic warning labels (GWLs) on cigarette packs have been tested among diverse groups at high risk for tobacco use. However, little is known about the effectiveness of GWL interventions for persons with substance use disorders, whose smoking prevalence is 3 to 4 times that of the general population. After a clinical trial which exposed clients in residential addiction treatment to GWLs for 30 days, we conducted five focus groups with trial participants ($N = 33$) to explore how exposure to the labels may have impacted their readiness to quit smoking. Focus group interviews were analyzed thematically. Interviewees reported that GWLs were more effective than text-based warnings for increasing quit intentions due to greater cognitive and emotional impact. Male and female interviewees expressed gender-specific reactions to the labels. Addiction treatment programs are a strategic site for GWL and other tobacco interventions due to the tobacco-vulnerable populations they serve.

Keywords

addiction treatment, substance abuse, smoking cessation, graphic warning labels

Introduction

Graphic warning labels (GWLs) depicting the health risks of smoking are currently legislated for use in over 100 countries worldwide (Campaign for Tobacco-Free Kids, 2017), but not in the United States. Currently, U.S. cigarette packs bear only text-based warnings with messages approved by the Surgeon General and the U.S. Food and Drug Administration (FDA). In the last several years, the FDA has attempted to join other countries in implementing Article 11 of the World Health Organization (WHO) Framework Convention on Tobacco Control (WHO, 2003), which encourages the use of GWLs on tobacco products. The tobacco industry initially blocked the FDA's attempts, claiming that requiring them to use GWLs threatened their First Amendment rights. In 2012, after a protracted legal battle, the U.S. Court of Appeals for the D.C. Circuit tasked the FDA with demonstrating the effectiveness of GWLs (Public Health Law Center, 2016).

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GWLs are designed with two goals in mind: to inform consumers about the health risks of smoking and to help reduce smoking prevalence. Studies indicate that GWLs may increase knowledge of tobacco-related diseases (Thrasher, Hammond, Fong, & Arillo-Santillán, 2007), encourage quit attempts (Azagba & Sharaf, 2013; Borland et al., 2009; Hammond, Fong, McDonald, Cameron, & Brown, 2003), motivate smokers to access cessation services (Miller, Hill, Quester, & Hiller, 2009), and help prevent smoking relapse after quitting (Partos, Borland, Yong, Thrasher, & Hammond, 2013).

Studies of reactions to GWLs have been conducted with diverse populations considered vulnerable to tobacco use, including adolescents (McCool, Webb, Cameron, & Hoek, 2012), young adults (Hoek, Hoek-Sims, & Gendall, 2013), older adults (Cataldo, Hunter, Petersen, & Sheon, 2015), women (Levis et al., 2014), and low-income adults (Bigman, Nagler, & Viswanath, 2016; Mead, Cohen, Kennedy, Gallo, & Latkin, 2015). Few studies, however, have focused on populations with increased tobacco vulnerability due to mental or behavioral health disorders. Exceptions include studies of GWL reactions among persons with depression (Osman et al., 2016) and schizophrenia (Coletti et al., 2015). Both identified higher rates of emotional response to GWLs in comparison to healthy controls. Higher emotional reactivity to GWLs has been associated with increased intent to quit and reduced smoking (Hammond, Fong, McDonald, Brown, & Cameron, 2004; Kees, Burton, Andrews, & Kozup, 2010). Given the high prevalence of psychiatric comorbidity among persons in addiction treatment, reported as two-thirds by one large-scale study (Chan, Dennis, & Funk, 2008), it is conceivable that this population might also display more intense emotional responses to GWLs as compared to persons without behavioral health disorders. However, no research currently exists on emotional reactivity to GWLs among persons in addiction treatment.

Smoking prevalence is alarmingly high among persons with mental and/or substance use disorders (Kalman, Morissette, & George, 2005), and has not followed the decline observed in the general U.S. population in recent years (Cook et al., 2014; Secades-Villa et al., 2013). Tobacco use prevalence among addiction treatment clients is 3 to 4 times greater than that of the general population (Guydish et al., 2011). Consequently, persons in addiction treatment have higher mortality rates from tobacco-related causes in comparison with the general population (Bandiera, Anteneh, Le, Delucchi, & Guydish, 2015) and are more likely to die of tobacco-related causes than from abuse of alcohol or other drugs (Hurt et al., 1996). They are therefore a vulnerable population of interest for GWL development and testing.

Few studies (Brewer et al., 2016; Guydish et al., 2016; Malouff, Schutte, Rooke, & MacDonell, 2012) have evaluated the effectiveness of GWLs using a behavioral outcome, and only one clinical trial (Guydish et al., 2016) has tested GWLs among addiction treatment clients. This clinical trial, conducted by our research team, found that participants whose cigarette packs were labeled with GWLs for 30 days were more likely to attend a post-study smoking cessation group than those who received clear labels on their packs for the same amount of time (odds ratio [OR] = 1.58, 95% confidence interval [CI] = [1.02, 2.44]). The qualitative study reported here aimed to explain how and why exposure to GWLs increased participants' readiness to quit smoking.

Method

Parent Study Methods

The parent study, described fully elsewhere (Guydish et al., 2016), was conducted in three residential addiction treatment programs in San Francisco. These programs serve low-income persons who are uninsured or publicly insured. Consistent with national data, smoking prevalence in these programs ranged from 76% to 80%. Participants were male and female clients who self-identified as current cigarette smokers, had been in the program for at least 2 weeks, and had at least 60 days until program completion.

Figure 1. Example of an experimental condition graphic warning label (L) and a control-condition transparent label (R).

From 2014 to 2016, parent study participants ($N = 601$) were assigned to have either GWLs (experimental) or clear (control) labels affixed to their cigarette packs for 30 days. Participant cohorts alternated sequentially between study conditions, and each cohort completed a baseline survey, 4 weeks of labeling, a follow-up survey, and assessments of expired carbon monoxide (CO) at baseline and follow-up. Three times per week, participants reported to labeling sessions during which research team members placed either graphic (experimental) or clear (control) labels on their cigarette packs (Figure 1). In the experimental condition, one of the nine FDA GWLs (Figure 2) was selected using a table of random numbers, and placed on the front and back of each pack. Control-condition participants received only clear labels on their packs.

Focus Group Participants

Twenty men and 13 women ($N = 33$) participated in focus group interviews (Table 1) within 1 to 2 weeks after completing the parent study. All had been in their treatment program for a minimum of 6 weeks. Participants' mean age was 41 years. Thirty-nine percent identified as White/Caucasian, 27% as Black or African American, and 21% as Hispanic or Latino. Thirty-six percent had less than a high school education, and the same percent had never been married. Alcohol (27%) and amphetamines (24%) were the most common drugs for which participants were in recovery. Participants had smoked for 27 years on average, and their mean number of cigarettes per day (CPD) was 11.5. About 12% had attempted to quit smoking in the month prior to their focus group.

Focus Group Recruitment

Clinical trial participants were invited to focus group interviews 1 to 2 weeks after their cohort had completed all research activities. All groups except one (Group 3) were drawn from experimental cohorts. We included one focus group from the control condition to assess whether control participants had been inadvertently exposed to the GWLs during the study, and also to

Figure 2. Nine U.S. Food and Drug Administration (FDA)–proposed graphic warning labels.

compare control participants' interview responses with those of experimental participants. Focus Groups 1, 2, and 4 were women-only, while Groups 3 and 5 were men-only. Participants were separated by gender since treatment facilities were either all-male or all-female. Each focus group participant received a US$20 gift card.

Data Collection

We conducted five focus groups between October 2015 and March 2016 at the treatment facilities. The first author facilitated the groups, and other research team members observed and took detailed notes. Focus Groups 2 through 5 were digitally recorded and transcribed. During focus groups, the facilitator passed around a sheet with the nine FDA-proposed GWLs to refresh participants' memory of the labels (if applicable) and elicit their reactions to labels they had not previously seen.

We used two focus group interview guides, one for experimental condition cohorts and one for the control cohort. For the experimental group, interview questions elicited participants' reactions to graphic images on their own or others' packs, any changes in their smoking behavior during the study, whether and how they believed the labels might have affected their smoking behavior, whether they had talked about or shared their labels with other clients in their treatment program, whether they had purposely tried to avoid looking at the labels, whether they had attended all labeling sessions, and whether they planned to attend upcoming smoking cessation groups.

For the control group, interview questions asked participants why they thought we had placed clear labels on their packs, whether they thought the clear labels may have affected their smoking behavior in any way, whether/how much they had seen graphic labels on the packs of experimental condition participants, their reactions to graphic labels seen on others' packs and on the sheet passed around during the focus group, whether they had attended all labeling sessions, and whether they planned to attend upcoming smoking cessation groups. All research activities were approved by the University of California, San Francisco Institutional Review Board.

Data Analysis

Data analysis was inductive and informed by grounded theory (Glaser & Strauss, 1967). The first author reviewed focus group transcripts and notes several times to identify recurrent themes.

Table 1. Demographic Characteristics and Smoking Behaviors among Clients Participating in Focus Group Discussion (N = 33).

Characteristic	M (SD) or n (%)
Age	41.4 (10.40)
Gender	
Female	13 (39.4%)
Male	20 (60.6%)
Education	
Less than high school	12 (36.4%)
High school/General Educational Development (GED)	11 (33.3%)
Some college	10 (30.3%)
Race/ethnicity	
Hispanic	7 (21.2%)
Black/African American	9 (27.3%)
White	13 (39.4%)
Asian/Pacific Islander	1 (3.0%)
Other/Multiple	3 (9.1%)
Employed	0 (0%)
Marital status	
Never married	12 (36.4%)
Married/long-term relationship	10 (30.3%)
Separated/divorced/widowed	11 (33.3%)
Primary drug used	
Alcohol	9 (27.3%)
Amphetamines/methamphetamines	8 (24.2%)
Crack/cocaine	3 (9.1%)
Heroin/methadone/opiates	10 (30.3%)
Other	3 (9.1%)
Years smoked	27.2 (9.93)
Cigarettes per day (CPD)	11.5 (7.25)
Any quit attempts/past 30 days	4 (12.1%)
Ever used NRT[a] products	10 (30.3%)

[a]"NRT" refers to nicotine replacement therapy. "NRT products" include nicotine patches, gum, and lozenges.

After discussing these themes with other research team members who had been present at the focus groups and reaching consensus, she uploaded the documents into ATLAS.ti (Muhr, 2013), created codes using the identified themes, and applied the codes electronically to corresponding sections of text. After completing within-text coding, she applied category codes to designate documents as "experiment" or "control" and "male" or "female." Next, she reviewed the coded text sections once again and compared them across gender and cohort condition to identify patterns associated with these variables. Finally, she selected interview quotes to exemplify and help explicate the most frequently occurring themes. Themes and quotes are discussed below.

Findings

"Planting the Seed"

Several focus group participants stated that seeing GWLs on their packs helped to "plant the seed" in their minds about smoking cessation. These participants described a gradual move from a "precontemplation" to a "contemplation" stage of change, in which they began to seriously consider quitting (Prochaska & Velicer, 1997):

> [The labels] are to make you think, to plant the seed. When you see pictures like that, they get engraved in your brain . . . it makes you more conscious. (Male, FG #5, graphic)

> I would say it's the first time that I actually brought the thought into my head, about maybe quitting at some point. (Female, FG #4, graphic)

> So of course, now that [the label] has sparked it in me to start questioning when I am going to quit, it would eventually speed up the process for me to at least make an attempt . . . walkin' around, watchin' death, black lungs—I definitely would make an attempt sooner rather than later. (Male, FG #5, graphic)

Other participants used the phrase "planting the seed" in reference to GWL images counteracting the allure of smoking among younger smokers. Some were unsure that GWLs would help established smokers to quit but thought they might deter young people from starting to smoke:

> Just 'cause it brings some awareness to them, that maybe some people don't know. Younger ones that have just started, you might catch them pretty quick that way. (Female, FG #4, graphic)

> P1: I'm sure there's some people who maybe are just pickin' up a pack of cigarettes for the first time that may be like "whoa," they just don't know [the risks].

> P2: Children. The kids would see it.

> P1: I was young when I started, I'd probably—I think I probably wouldn't pick up if I [saw the labels]—I was so young when I started smoking. I was like 7, and I'm 28 now so—yeah. (Female participants, FG #4, graphic)

Participants in both excerpts emphasized the GWLs' health education function, and specifically mentioned young people, which was more common among women participants. Participant 1 from the second excerpt also displayed self-referential thinking, an important cognitive mechanism by which GWLs may affect consumers (McQueen et al., 2015).

"A Picture Is Worth a Thousand Words"

Several participants indicated that GWLs delivered antismoking messages more effectively than text-based warnings. They described a different cognitive process taking place when they viewed the graphic images as opposed to reading the Surgeon General's text-based warnings, for instance, stating that GWLs "imprinted" differently on the brain, became "more ingrained," were processed more directly than words, or were retained more easily than words. A female participant (Group 4) believed GWLs were processed by "a different part of your brain that I think is . . . more profound." When asked whether the labels would help people quit smoking, a male participant responded:

> I think they definitely will, because human beings are definitely visual people . . . that's the first thing that draws our attention . . . in this room, we have two paintings up here, one of some roses and one of some written words. Now, if we both glanced at 'em for two seconds and turned our head, I would be able to remember the roses, [but] I would not be able to tell you what the words are. (Male, FG #5, graphic)

A female participant made a similar observation:

> If I was to be asked right now, before I look at [the refresher sheet of images], I could probably off the top—name quite a few of 'em just by the initial interaction with them being put on the pack, without really studying them. (Female, FG #4, graphic)

A few participants commented that the GWLs' shock value would affect consumers unconsciously, even if they had no overt thoughts or feelings about the health risks of smoking while viewing them:

> We're human, everybody—you're gonna be affected by 'em one way or another. If it's conscious or unconscious, you're gonna get an effect. (Male, FG #5, graphic)

> It's like a subconscious message, once it's in your brain, it's there, it's not like you obsess about it per se, but in the society that we live in, we're well aware of all the harms [of smoking]. (Female, FG #4, graphic)

Participants often mentioned that their own or their families' smoking-related health problems increased the salience of certain labels for them—another form of self-referential thinking. For example, one female participant from Group 2 disliked the image of a male cadaver with a stitched-up chest because it reminded her of a male relative who had died from smoking-related causes. Another participant also associated certain images with her family's extensive tobacco-related health problems:

> I think my family may have a lot of mouth and throat cancer, so a lot of those pictures really hit home in that sense, because I've seen all that—trachea tubes, and my mother died from lung cancer, and my father, emphysema. I have cousins and aunts, all have had [similar problems]—so it's really impactful, probably, to someone like me who has seen that. (Female, FG #2, graphic)

In addition to their comments about the GWLs' cognitive effects, a few participants noted that GWL images would be more accessible to consumers who either could not read, or had difficulty reading the fine print of the Surgeon General's text-based warnings. Other studies have also reported this benefit of GWLs, especially within low-income countries with high rates of illiteracy (Fong, Hammond, & Hitchman, 2009; Singh, Owusu-Dabo, Britton, Munafò, & Jones, 2014).

"Out of Sight, Out of Mind"

In each focus group, there was considerable discussion of techniques used to avoid looking at the GWLs affixed to participants' packs. These included turning over the packs so as to hide the images with their hands, keeping the packs in their pockets or purses so they would not see the GWLs when retrieving a cigarette, storing packs in their rooms, discarding the plastic wrapper to which the GWL was affixed, and trying to finish their labeled packs as quickly as possible, either by smoking more or sharing more cigarettes:

> I tried to get through the packs as quick as possible [laughs] . . . If I have a surplus . . . I'm kinda generous with the other brothers, especially guys who just got here. But I tried to run through 'em, get that pack up off me. I just did 'cause I don't want to look at it, especially when I had the baby [image]. I was racin' through those packs. You know, like I say, it was an expensive survey [laughs]. (Male, FG #5, graphic)

Another participant initially tried to avoid the GWLs by keeping his pack in his pocket, but his strategy proved insufficient:

> At first, [the labels] didn't bother me 'cause [my pack] was always in my pocket, but . . . I started seeing other people's, so I started paying more attention to mine, especially the [image of the] lady with the secondhand smoke—that was horrible because now, I started being more conscious of when

> I was smoking on the street 'cause I get these looks and I don't like getting looked at like that . . . I didn't smoke all day yesterday, I haven't smoked today, because I'm tired of the people givin' me the funny looks and I really do feel bad about blowin' smoke in people's faces. Those stickers are frickin' horrible. (Male, FG#5, graphic)

Besides developing intensified concern with nonsmokers' judgment, this participant experienced "secondhand" GWL effects, such that seeing other participants' GWLs caused him to think more about the ones on his own packs and smoke fewer cigarettes.

In addition to physically concealing packs, a few participants avoided the GWLs' messages cognitively through counterarguments (statements meant to call into question or deny the veracity of the messages on the labels):

> I have a hard time with [believing the labels] because I was told before that . . . the disease emphysema was around before cigarette smoking ever started. So I kind of have this belief that if we're predisposed to these problems, cigarette smoking is gonna cause more problems. But if a person is not predisposed, then they don't for sure cause all these problems. (Female, FG #4, graphic)

> My grandpa didn't smoke and he still had to get that—trach. He didn't smoke, though . . . So you know what I mean, like—and my mom never drank and she got that stomach cancer. I mean, either way—I don't know. (Female, FG #2, graphic)

> P1: I heard one doctor say sittin' in second-hand smoke is worse than smoking.

> P2: It is, because it has extra carbon dioxide. You don't have a filter. When we smoke, there's a filter. (Females, FG #2, graphic)

Another recent study of GWL reactions also identified these two types of counterargument: "message rejection," or doubting the veracity of a message perceived as unpleasant or personally threatening (Excerpt 1), and "normalizing the harm," in which the individual downplays the risk of a specific behavior (Excerpts 2 and 3) (McQueen et al., 2015).

Gender-Specific Reactions

Male and female participants differed somewhat in their assessments of image salience. Male participants found images of men less emotionally salient than images of women or children. Some observed that hypermasculine advertising tropes have linked smoking to rugged masculinity, making it more difficult to view male smokers as vulnerable to the health risks of smoking:

> I think women and children move people more than men . . . because that was the original thing that helped propagandize people into smokin', was the Marlboro man and tough guys smoking cigarettes, and it was just cool to smoke cigarettes. So women and children being hurt, seein' that picture of them in distress, will [affect] most people—more so than a big heavy 300-pound biker guy. (Male, FG #5, graphic)

> . . . [H]ow many of you guys remember the old Tareyton commercials, where the guy's got a black eye and is saying, "I'd rather fight than quit"? [It's] part of the machismo of being a smoker . . . It was always a tough-looking guy, he got a black eye, cigarette's broken at the end, but he's still puffin' on it. (Male, FG #5, graphic)

Female participants reacted most negatively to the image depicting smoke being blown into an infant's face but were unmoved by the image of a woman crying. Discussing the baby image led several women to speak about the negative health effects their smoking had on their children,

or about how their mothers' smoking had affected them. One female participant from Group 2 described her mother as the "postcard" of a typical 1960s housewife with a "beehive hairdo, a drink in one hand and a cigarette in the other." As a result of her mother's smoking, this participant had developed chronic asthma and bronchitis during childhood. Several female participants from Groups 1 and 2 reported feeling disturbed by the baby image because they had smoked during their pregnancies. One woman (Group 2) attributed her infant's respiratory problems at birth to her smoking, whereas another woman (Group 1) feared her smoking might have contributed to her infant's premature death.

No Reaction

A few participants claimed they were indifferent to the images:

> . . . [Y]ou guys just put it on there and I would just forget about it. It's not like I tried to—I would just—my intentions are not to look at the label. My intentions are to get a cigarette out of my pack and put it back in my pocket and smoke. (Male, FG #5, graphic)

> Everybody's different. Like for me, I look at them like, "oh, it's just another sticker, you know, the study, whatever . . ." With just stickers like that, honestly how I felt, it didn't really touch me. But I don't think it would really touch anybody unless they know in reality anyone in their family, their close friends or—that's been through something in particular, you know. (Female, FG #2, graphic)

The male participant's comment supports the finding of a recent ethnographic study (Bell, Dennis, Robinson, & Moore, 2015) that many smokers may interact with their packs primarily through touch ("handiness") rather than visually. The female participant reinforced the importance of self-referential thinking and exemplification as mechanisms for GWL salience. Another male participant in Group 3 (control) who had spent time in Canada and bought packs with GWLs initially claimed they had no effect on him, but acknowledged that he might be avoiding unpleasant feelings prompted by the labels: "As an addict I'm pretty good at pushing away feelings that come to mind, pretty neatly." During focus groups, participants often referred to themselves as "addicts" while suggesting they might have a harder time quitting tobacco than the average smoker due to their greater "addictive tendencies." Several participants also stated that it was particularly difficult to give up tobacco in addition to their primary drug of addiction since cigarettes were "all [they] have left."

The Social Life of GWLs in Addiction Treatment Programs

Despite efforts to minimize "contamination" between experimental and control cohorts in the parent study, focus group participants reported that the GWLs had circulated throughout the programs. This may have affected their reactions, as interpersonal communication about warning label content has been shown to predict subsequent quit attempts among smokers (Thrasher et al., 2016). Participants in the experimental condition frequently discussed the graphic images they received with "control" participants, or with other program residents who were not participating in the parent study:

> Interviewer: Who did you talk about [the labels] with?
> Participant: Another person that was here, that left, another client.
> I: Was she in the study also?
> P: No.
> I: And what did that conversation look like?

P: It was a picture of a baby, and she was like, "oh, poor baby," you know. So—we just talked about the labels and how graphic they could be, and I think I had the one with the hole in the throat and—she talked about how that would suck to have to smoke from your throat, you know. (Female, FG #2, graphic)

P: I would say it's the first time that I actually brought the thought into my head, about maybe quitting at some point.
I: Why do you think that was?
P: Just it being talked about in general, and just—the thought of not smoking in my head. (Female, FG #4, graphic)

The previous two comments suggest that discussing the labels increased clients' consideration of the health risks of smoking and prompted them to consider quitting. However, this effect depended on the clients' interpretation of the labels' content. In one case, clients misunderstood a label's intended message and found it funny:

P: I think there was one day we sat and discussed the different pictures and—it was just a discussion. But that was the day where we were talking about the lady having a smoking—a nicotine fit, we thought. There was a bunch of us talking about it.
I: And what was the conversation like? What kind of things were people saying?
P: We were laughing at the lady, like if that's really what she's going through, nobody even read it so I feel kind of silly that, okay, she found out she had lung disease. I feel bad now.

Focus group participants in the "control" condition also described their reactions to the GWLs they had seen on the experimental cohorts' packs:

I saw some of the other labels that other people had, like the gum disease, that's horrid-lookin' right there . . . So when I saw the pictures on somebody else's pack, I saw those things and that really made me—It had a lot of effect on me. And I, too, want to quit. (Male, FG #3, control)

I was part of the placebo group, too . . . when I did my Breathalyzer [expired CO] test for the second time, my smoking had gone down because I had the pictures of stickers in my head still, so that kind of helped me, plus the fact that I did want to start cutting down. (Male, FG#3, control)

These comments suggest that seeing GWLs motivated control-condition participants to think about quitting and occasionally to take action, despite their lower level of GWL exposure as compared with experimental participants. However, the parent study showed significantly higher intent among experimental cohorts to attend smoking cessation groups offered after the clinical trial had ended, indicating that the level of GWL exposure was a key variable mediating the impact of GWLs on study participants.

Discussion

Persons with substance use disorders are an important tobacco use disparity group (Williams, Steinberg, Griffiths, & Cooperman, 2013). Not only are their smoking rates disproportionately high, but these individuals have more difficulty quitting in comparison with the general population (Weinberger, Pilver, Hoff, Mazure, & McKee, 2013). Addiction treatment can be a strategic point of intervention since clients may have more cessation support while in treatment.

This study examined addiction treatment clients' reactions to GWLs. Although our study was conducted in a novel population with high smoking prevalence, participants' core reactions to the

labels were similar to those reported in studies of other populations. This finding reinforces GWLs' utility in general, as well as their utility for tobacco-vulnerable priority populations. Our study participants described both cognitive and affective impacts of GWLs, which have been signaled as key mediators of smokers' increased desire to quit after GWL exposure (Emery, Romer, Sheerin, Jamieson, & Peters, 2014). Participants were more likely to recall images that were emotionally salient to them, especially those they identified with personally due to their own or family members' tobacco-related health problems. This finding is aligned with previous research showing that exemplification (the extent to which consumers identify with exemplars pictured on GWLs who share their demographic characteristics) is an important component of self-referential thinking, which in turn has been linked to increased motivation to quit (Bigman et al., 2016; McQueen et al., 2015).

The only demographic characteristic mentioned by our focus group participants when discussing GWL exemplars was gender (i.e., female exemplars prompted more sympathy than male exemplars)—and gender was mentioned only by male participants. However, we did observe some different patterns in the images that held the most salience for men versus women. Other studies have also identified gender-specific reactions to GWLs, such as women being particularly affected by images of babies (Levis et al., 2014; O'Hegarty, Pederson, Yenokyan, Nelson, & Wortley, 2007) and by images depicting the aesthetic consequences of smoking such as rotting teeth (McCool et al., 2012; Reiter et al., 2012).

The avoidance techniques described by our focus group participants also surfaced in studies of smokers in Canada, the United Kingdom (Bell et al., 2015), and Australia (Guillaumier, Bonevski, & Paul, 2014). Although one might expect avoidance of GWLs to limit their effectiveness through reduced exposure, existing research indicates that avoidance may have no impact on smokers' cognitive elaboration about the health risks of smoking or on their cessation behavior—at least in contexts where GWLs are widely disseminated (Hammond et al., 2004).

Clients' discussions about the labels had the potential to increase their impact not only on those who had the labels on their packs but also on other clients who viewed the labels. Studies conducted in nontreatment populations have found that interpersonal communication about GWLs can increase quit intent and attempts, while diffusing the labels' messages into smokers' social networks (Hall et al., 2015; Hammond et al., 2003; Thrasher et al., 2016). Such interpersonal effects occur within the context of a "two-step" information flow (Katz & Lazarsfeld, 1966), whereby health campaign messages spread both directly (to the viewers) and indirectly (through the viewers' interpersonal communication with others) (Popova, 2016).

While our participants' GWL reactions were similar to those of other populations, their responses were also shaped by their specific social context. Many participants described smoking as part of their substance use disorder, one that was often prioritized less than their recovery from "harder" drugs that could land them in jail or lead to a fatal overdose. Participants also described a shared camaraderie around smoking within their treatment programs that presented a challenge to quitting. At the same time, the context of addiction treatment served to stimulate and reinforce discussion among clients about the health risks of smoking. Participants' identity as persons in recovery and their unique social environment (a residential addiction treatment program) surfaced continually in their responses.

Our study encountered some limitations. Due to our small sample size, our findings may not be generalizable to other addiction treatment populations. Focus group interviewees may also have reacted differently to the GWLs than parent study participants who were not in the focus groups. Furthermore, our sample included four focus groups with participants who had received experimental labels and only one with participants who had received control labels. This was done deliberately as experimental condition participants had more exposure to the GWLs used in the parent study, which lent itself more readily to a study of GWL reactions. In addition, we were unable to control interpersonal communication about the GWLs between participants and nonparticipants, and between experimental and control participants. We attempted to limit such contamination by

alternating study condition cohorts and allowing a 1-week "wash-out" period after each cohort had completed its 4 weeks of labeling, to lessen the chance that study-provided labels would still be on clients' packs. However, clients' interaction outside of the study was beyond our control. Finally, we did not ask whether participants found the labels inappropriately scary or disgusting, nor did we ask whether they believed the warnings were accurate. There has been concern among some tobacco researchers that excessive fear appeals may cause viewers to reject the veracity of health warnings (Erceg-Hurn & Steed, 2011; Ruiter, Kessels, Peters, & Kok, 2014).

Despite these caveats, this study reports novel findings on GWL reactions among an important tobacco disparity group with high smoking prevalence: addiction treatment clients. Development and testing of GWLs should continue to include tobacco use disparity groups, which may have diverse smoking cessation challenges and opportunities based on aspects of their social environments. For instance, addiction treatment clients' reactions to GWLs may be magnified due not only to the psychological and behavioral transitions they are undergoing but also to close interaction with others struggling with multiple addictions. Treatment settings can also be challenging environments for smoking cessation due to the sheer numbers of persons in recovery who smoke, and to the stress and boredom that many clients experience, particularly in residential settings. Given these conditions, GWLs may help to support smoking cessation among addiction treatment populations by evoking strong reactions that increase clients' readiness to quit.

Acknowledgments

The authors thank the leadership, staff and patients of HealthRight 360 who supported this work.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by NCI/FDA P30 CA082103-17S1, by the California Tobacco Related-Disease Research Program (TRDRP 22XT-0049), and by the NIDA/FDA R01 DA 036066. Dr. Gubner was supported by NIDA T32 DA007250.

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