AIDS and Behavior (2018) 22:3847–3858
https://doi.org/10.1007/s10461-018-2093-6

ORIGINAL PAPER

The Influence of Internalized Stigma on the Efficacy of an HIV Prevention and Relationship Education Program for Young Male Couples

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Published online: 22 March 2018

Abstract

Young MSM are at increased risk for HIV, especially in the context of serious relationships, but there is a lack of couples-based HIV prevention for this population. The 2GETHER intervention—an HIV prevention and relationship education program for young male couples—demonstrated promising effects in a pilot trial. However, there is evidence that internalized stigma (IS) can influence treatment outcomes among MSM. The current study examined the influence of IS on the efficacy of the 2GETHER intervention among 57 young male couples. The intervention led to decreases in percentage of condomless anal sex partners and increases in subjective norms regarding HIV prevention for those with low/average IS, but not high IS. The intervention also led to increases in motivation to get tested with one's partner and decreases in alcohol consumption for those with high IS, but not low/average IS. In contrast, IS did not moderate intervention effects on other motivational constructs, dyadic adjustment, or alcohol problems. In sum, IS influences the extent to which young male couples benefit from HIV prevention and relationship education depending on the outcome. Research is needed to understand how IS influences treatment outcomes.

Keywords Internalized stigma · HIV prevention · Relationship education · Same-sex couples · Young men who have sex with men

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Introduction

Men who have sex with men (MSM) are disproportionately affected by HIV [1]. In 2015, MSM accounted for 70% of new HIV diagnoses [1] and young MSM are the demographic group in which rates of new infections are increasing the most [2]. Historically, casual sex was thought to represent the greatest risk for HIV transmission, but accumulating evidence indicates that HIV transmission often occurs in the context of a serious or main partnership [3, 4]. In fact, it has been estimated that 79-84% of new HIV infections among young MSM can be attributed to serious/main partners [4], highlighting the urgent need to extend HIV prevention to young male couples. To address this, Newcomb and colleagues developed the 2GETHER intervention—an HIV prevention and relationship education program for young male couples—which demonstrated promising effects in a pilot trial [5]. While encouraging, there is also evidence that internalized stigma (i.e., the internalization of negative societal attitudes toward a stigmatized group) can influence

the extent to which MSM benefit from behavioral health interventions [6, 7]. These findings call attention to the importance of examining individual differences in treatment outcomes in order to refine interventions to maximize their benefits and to understand who will benefit the most from them. As such, the goal of the current study was to examine the influence of internalized stigma on the efficacy of the 2GETHER intervention.

HIV Transmission Among Young Male Couples

Findings from previous research support several explanations for why serious/main partnerships present the greatest risk for HIV transmission [3, 4]. First, young MSM are more likely to engage in condomless anal sex (CAS) with serious/main partners compared to casual partners [4, 8, 9], which they do as a way to express trust and intimacy and because they perceive their relationship to be monogamous/low-risk [10, 11]. Given that male couples report infrequent HIV testing, even when they engage in CAS with outside partners [12, 13], and that many young MSM are HIV-positive and unaware of their status [14], young MSM may unknowingly put their serious/main partners at risk. Second, it is common for male couples to develop agreements that describe the conditions under which outside partners are permissible in an effort to reduce HIV transmission risk in their main partnerships [15, 16]. However, a large proportion of male couples do not have an agreement or disagree about the rules [17–19], and breaks in agreements are common [18], all of which can increase exposure to HIV/STIs. Further, HIV prevention tends to focus on reducing CAS with casual partners [20], leading to a lack of preparedness to navigate the complexities of HIV prevention in relationships (e.g., timing of HIV testing, condom and PrEP use, developing a sexual agreement).

Couples-Based HIV Prevention

Couples-based HIV prevention provides couples with skills to reduce HIV transmission risk in the context of serious relationships. Despite a number of couples-based HIV prevention programs for heterosexual adults, similar programs for MSM, especially young MSM, are lacking [21]. Exceptions include couples HIV testing and counseling (CHTC), a single-session, couples-based HIV prevention program that was designed for heterosexual adults in Africa [22–24] and adapted for adult MSM in the United States [25, 26], and Connect with Pride, a seven-session, couples-based HIV prevention program for methamphetamine-using, Black adult MSM [27, 28]. These programs represent promising advances in extending couples-based HIV prevention to MSM, but neither addresses the unique developmental needs of young male couples. Recently, Newcomb and colleagues developed the 2GETHER intervention—an HIV prevention and relationship education program for young male couples [5]. The 2GETHER intervention integrates HIV prevention and relationship education content in a combined individual/group format to reduce HIV transmission risk by increasing information, motivation, and behavioral skills related to HIV prevention for couples and improving relationship functioning. It also teaches communication skills to promote relationship functioning and coping skills to use in response to stressors affecting same-sex couples (e.g., discrimination). In an uncontrolled pilot trial, the 2GETHER intervention demonstrated preliminary efficacy, including decreases in HIV risk behaviors, increases in information, motivation, and behavioral skills related to HIV prevention, and increases in relationship investment from baseline to 2-week follow-up. These findings suggest that integrating HIV prevention and relationship education has the potential to reduce HIV transmission risk among young male couples.

The Role of Internalized Stigma in HIV Prevention

While these findings are encouraging, it is likely that some young MSM benefit more from HIV prevention and relationship education than others. It is important to identify individual differences in treatment outcomes to maximize intervention efficacy and to understand who will benefit most from an intervention. One factor that has the potential to influence the extent to which young male couples benefit from HIV prevention and relationship education is internalized stigma. A meta-analysis demonstrated a small overall effect size for the association between internalized stigma and sexual risk behavior among MSM, which decreased in strength over time [29]. Still, there is evidence that MSM with higher internalized stigma report less awareness of HIV prevention interventions [7] and that internalized stigma can influence the extent to which MSM benefit from behavioral health interventions. For example, Millar and colleagues found that an LGB-affirmative mental and behavioral health intervention for gay and bisexual men led to larger reductions in heavy drinking for men who self-reported higher internalized stigma [6]. The intervention also led to larger reductions in depression, anxiety, and CAS with casual partners for men who scored higher on an implicit measure of internalized stigma. They suggested that men with higher internalized stigma may have found the intervention's focus on minority stress more relevant and helpful compared to those with lower internalized stigma. In contrast, Huebner and colleagues found that a single-session, group-based HIV prevention program for MSM led to smaller increases in condom use self-efficacy for men who self-reported higher internalized stigma [7]. These contrasting findings may be due to differences in the measurement of internalized stigma. Studies have demonstrated modest correlations between implicit and explicit measures of internalized stigma [6, 30, 31] and that

implicit measures are stronger predictors of outcomes compared to explicit measures [6, 30, 32]. Therefore, it is possible that implicit and explicit internalized stigma have different influences on the extent to which behavioral health interventions lead to changes in sexual health outcomes for MSM. Huebner and colleagues also found that self-reported internalized stigma was associated with feeling less similar and relating less well to other members of the group [7], suggesting that it may impede learning in the context of group-based HIV prevention. Finally, it is also possible that men with higher internalized stigma need more than a single session to become comfortable in a group setting, and that with more time they may have benefited more from the intervention.

In sum, there is conflicting evidence as to whether or not internalized stigma increases or decreases the efficacy of behavioral health interventions for MSM. The available evidence suggests that internalized stigma may increase the efficacy of an individual intervention specifically focused on minority stress [6], while it may decrease the efficacy of a group-based HIV prevention program [7]. These conflicting findings highlight the need for additional research to understand the nuanced ways in which internalized stigma influences the efficacy of HIV prevention programs for gay and bisexual men, especially those at greatest risk (e.g., young male couples).

The Current Study

The goal of the current study was to examine the influence of self-reported internalized stigma on the efficacy of the 2GETHER intervention. Given limited previous research on this topic and conflicting findings, we considered this study exploratory. It is possible that young MSM with higher internalized stigma will benefit more from the 2GETHER intervention, because it provides an affirming and supportive environment to interact with other young male couples and learn skills to cope with the stressors affecting same-sex relationships. Such an environment has the potential to reduce internalized negative beliefs about gay/bisexual men and, in turn, lead to greater benefits from the intervention. However, it is also possible that higher internalized stigma will prevent young MSM from benefitting from HIV prevention and relationship education, because it may inhibit them from relating to other young male couples and learning about HIV prevention and relationship functioning in a group environment.

Methods

Participants

The pilot trial of the 2GETHER intervention included 57 young male couples recruited from the Chicago area (individual $N = 114$). Detailed information about participants and procedures have been reported elsewhere [5]. In brief, inclusion criteria for both members of the couple were: (1) cisgender men (i.e., assigned male at birth and identified as male); (2) gay, bisexual, or same-sex attracted; (3) at least 18 years old (and one member of the couple was required to be 18–29 years old); (4) considered each other primary partners; (5) reported oral or anal sex with each other in the previous 3 months; and (6) agreed to have intervention sessions audio recorded. Participants were recruited using venue-based recruitment (e.g., local Pride events) and targeted advertisements on Facebook.

The mean age of participants was 26.4 years ($SD = 4.6$) and most participants were 18–29 (86.0%). The sample was racially/ethnically diverse (51.8% White, 11.4% Black/African American, 23.7% Hispanic/Latino, 7.0% Asian, and 6.1% multiracial). Most participants identified as gay (87.7%), while 7.0% identified as bisexual and 5.3% identified as queer. In regard to HIV-status, 80.7% of participants were HIV-negative, 11.4% were HIV-positive, and 7.9% did not know their HIV status. Of the 101 participants who were HIV-negative or did not know their HIV status, 8 reported using pre-exposure prophylaxis (PrEP) in the past 12 months at baseline. Of the 13 participants who were HIV-positive, all of them reported being on antiretroviral (ARV) medications and having an undetectable viral load at baseline. Relationship length ranged from 3 months to over 6 years ($M = 1.6$ years; $SD = 1.3$ years).

Procedure

Participants completed a baseline assessment, the 2GETHER intervention (described below), and a follow-up assessment 2 weeks after the intervention. Two couples withdrew after completing the first intervention session and all but one participant completed the follow-up assessment. Participants received up to $75 in compensation based on their participation level. All procedures were approved by the affiliated Institutional Review Board.

The 2GETHER intervention consisted of four weekly, in-person sessions. The first two sessions were psychoeducational groups for up to eight couples. The group format was intended to foster a sense of community and to facilitate learning from other couples. Two facilitators, at least one of whom identified as a sexual or gender minority, led the group sessions. Facilitators came from diverse educational backgrounds, participated in a two-day training, and received biweekly group supervision. Session 1 focused on defining healthy and unhealthy relationship characteristics, teaching effective communication skills, providing couples-based sexual health information (including HIV/STI prevention), and discussing strategies for increasing couples' connectedness (e.g., scheduling dates). Session 2 focused

on cognitive-behavioral and acceptance-based strategies for coping with stressors affecting young male couples. The group sessions were highly interactive and the content was delivered in diverse formats (e.g., a Prezi presentation, video clips, worksheets, quizzes, facilitated discussions, role-plays).

The last two sessions were skills coaching sessions in which each couple was paired with one facilitator to focus on applying the skills that they had learned in the first two sessions to their relationship. Session 3 focused on applying effective communication and problem-solving skills to relationship issues identified by the couple, while Session 4 focused on sexual health, including optimizing sexual satisfaction and drafting a relationship agreement. Participants who were HIV-negative or unsure of their status were also offered couples-based HIV testing, while participants who were HIV-positive received a brief medication adherence intervention [33]. At the end of each of the four sessions, participants were assigned homework focused on applying the skills that they had learned in that session to their everyday lives. Additional information about the 2GETHER intervention can be found elsewhere [5].

Measures

Demographics and internalized stigma were only assessed at the baseline assessment, while all other constructs were assessed at both the baseline and follow-up assessments.

Demographics

Participants reported their age, sexual orientation, race/ethnicity, HIV status, use of biomedical HIV prevention (i.e., PrEP use for HIV-negative participants and those who did not know their HIV status, ARV use and viral load for HIV-positive participants), and relationship length.

Internalized stigma

In a previous study [34], Puckett and colleagues examined the factor structure of 22 items from existing measures of internalized stigma including the Homosexual Attitudes Inventory [35] and the Internalized Homosexual Stigma Scale [36]. They identified three factors: (1) desire to be heterosexual; (2) fear of coming out; and (3) fear of stereotypical perception. The "desire to be heterosexual" subscale demonstrated the strongest psychometric properties (internal consistency and test-retest reliability) and most closely reflected the definition of internalized stigma as the internalization of negative societal attitudes toward sexual minorities [37]. In contrast, the other subscales more closely reflected related but distinct experiences of minority stress, including fears of coming out and being stereotyped. Based on their recommendation, we used the eight-item "desire to be heterosexual" subscale as our measure of internalized stigma. Participants were asked how much they agreed with statements such as, "Sometimes I wish I were not gay." Items were rated on a 4-point scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) and responses were averaged ($\alpha = .88$). Scores ranged from 1.00 to 3.50 ($M = 1.57$, $SD = 0.56$).

Sexual Risk Behavior

The HIV-Risk Assessment of Sexual Partnerships (H-RASP) [38] was used to measure sexual risk behavior. Participants were asked to report the number of partners they had anal sex with during the 2-month reporting period and the number of those partners for whom anal sex was condomless. For analyses, we calculated the percentage of CAS partners out of the total number of anal sex partners for each participant. Percentage of CAS partners ranged from 0 to 100% at baseline ($M = 90.1\%$, $SD = 25.7\%$) and follow-up ($M = 85.8\%$, $SD = 32.8\%$).

Motivation to Engage in HIV Prevention

Participants completed several measures of constructs related to motivation to engage in HIV prevention. First, to measure subjective norms regarding HIV prevention acts, participants completed a 10-item scale assessing perceived social support for HIV preventative behaviors [39]. This measure includes items such as, "Most people who are like me think I should take an HIV test," which are rated on a 1–5 scale (1 = very untrue, 5 = very true) and averaged ($\alpha = .80$ at baseline and .82 at follow-up). Scores ranged from 1.70 to 5.00 at baseline ($M = 3.82$, $SD = 0.61$) and from 2.10 to 5.00 at follow-up ($M = 3.96$, $SD = 0.60$).

Then, participants completed a series of questions focused on dyadic motivation to engage in four HIV prevention behaviors: (1) receive couples-based HIV testing; (2) use condoms; (3) use PrEP; and (4) discuss relationship agreements. For each behavior, participants were asked to rate the likelihood of four scenarios on a 1–5 scale (1 = very unlikely, 5 = very likely): (1) "You are afraid of what your partner might do to you if you ask to [behavior];" (2) "Your partner will think you don't trust him if you ask to [behavior];" (3) "Your partner won't trust you if you ask to [behavior];" and (4) "It will ruin the mood or interfere with romance in your current relationship if you ask to [behavior]." Mean composites were computed for each behavior. For dyadic motivation to receive couples-based HIV testing, scores ranged from 1.50 to 5.00 at baseline ($M = 4.70$, $SD = 0.64$) and from 2.00 to 5.00 at follow-up ($M = 4.77$, $SD = 0.56$). For dyadic motivation to use condoms, scores ranged from 1.50 to 5.00 at baseline ($M = 4.22$, $SD = 0.93$) and

from 1.25 to 5.00 at follow-up ($M = 4.04$, $SD = 1.07$). For dyadic motivation to use PrEP, scores ranged from 1.00 to 5.00 at baseline ($M = 4.02$, $SD = 1.19$) and from 1.25 to 5.00 at follow-up ($M = 4.28$, $SD = 1.08$). For dyadic motivation to discuss relationship agreements, scores ranged from 1.25 to 5.00 at baseline ($M = 4.40$, $SD = 0.92$) and from 2.00 to 5.00 at follow-up ($M = 4.48$, $SD = 0.87$). Cronbach's alpha was at least .79 for each scale.

Dyadic Adjustment

The Dyadic Adjustment Scale (DAS) [40] was used to measure relationship functioning. The DAS is a well-validated measure of romantic relationship functioning across four domains: satisfaction, cohesion, consensus, and affectional expression. Items were rescaled, such that 0 was the minimum value, and responses were summed to compute a total score. Responses could range from 0 to 156 ($\alpha = .90$ at baseline and .92 at follow-up) and higher scores reflected greater dyadic adjustment. DAS scores in our sample ranged from 84 to 152 at baseline ($M = 123.24$, $SD = 12.67$) and from 75 to 151 at follow-up ($M = 122.89$, $SD = 15.01$).

Alcohol use and problems

Alcohol use and problems were measured using the 10-item Alcohol Use Disorders Identification Test (AUDIT) [41], which was adapted to focus on the previous 2 months. Items were rated on a 0–4 scale and responses were summed, giving a maximum possible score of 40 ($\alpha = .83$ at baseline and .84 at follow-up). Scores ranged from 0 to 28 at baseline ($M = 6.25$, $SD = 4.86$) and from 0 to 29 at follow-up ($M = 5.73$, $SD = 4.58$). We also computed a measure of alcohol consumption (commonly referred to as a measure of quantity by frequency). To compute this measure, we multiplied responses to the first two items: "How often do you have a drink containing alcohol?" and "How many drinks containing alcohol do you have on a typical day when you are drinking?" Of note, for the measure of quantity by frequency, responses to the second item were re-scaled to 1–5, because the lowest possible value represented "1 or 2 drinks" rather than 0 drinks. Therefore, total scores could range from 0 to 20. Scores ranged from 0 to 16 at baseline ($M = 4.01$, $SD = 2.54$) and from 0 to 12 at follow-up ($M = 3.75$, $SD = 2.28$).

Analytic Plan

We used mixed-effects repeated measures models in SPSS 24 to test whether baseline levels of internalized stigma (IS) moderated the associations between time and intervention outcomes. Our models specified fixed effects of time (0 = pre-intervention, 1 = post-intervention), internalized stigma (mean-centered), and their interaction. Additionally, we included the following covariates: relationship length and dummy-coded race/ethnicity (White as the reference group compared to Black, Latino, and "other"). To control for dependency within couples, we designated "couple" as a random effect, thereby modeling the variance within couples at the same time as modeling the differences between individuals. When the time by internalized stigma interaction was significant, simple slopes were plotted and tested at low (− 1 SD), moderate (mean) and high (+ 1 SD) levels of internalized stigma. In sensitivity analyses, we included use of biomedical HIV prevention (0 = no biomedical HIV prevention use, 1 = PrEP use or undetectable viral load) as an additional covariate in the analyses focused on sexual risk behavior and motivation to engage in HIV prevention. Given that this covariate did not change the significance of the results and that most participants did not report using biomedical HIV prevention, we did not include it as a covariate in the primary analyses.

Results

Results of the mixed-effects models are presented in Table 1, results of the simple slope analyses are presented in Table 2, and graphical representations of the simple slopes are presented in Figs. 1, 2, 3, and 4. Results indicated that internalized stigma moderated intervention effects for four outcomes: the percentage of CAS partners, subjective norms regarding HIV prevention acts, motivation to get tested with one's partner, and alcohol use.

Sexual Risk Behavior

For the percentage of CAS partners, there was a significant main effect of time [$b = -0.04$, $p < .05$, 95% CI (-0.08, -0.004)], indicating that the percentage of CAS partners decreased from pre- to post-intervention. There was not a significant main effect of internalized stigma, but there was a significant time by internalized stigma interaction, which indicated that lower internalized stigma was associated with a larger decrease in percentage of CAS partners from pre- to post-intervention [$b = 0.07$, $p < .05$, 95% CI (0.001, 0.14)] (see Fig. 1). Simple slope analyses demonstrated that the proportion of CAS partners significantly decreased for those with low internalized stigma ($b = -0.08$, $z = -3.00$, $p < .01$) and average internalized stigma ($b = -0.04$, $z = -2.22$, $p < .05$), but not for those with high internalized stigma ($b = 0.00$, $z = -0.14$, $p = .90$).

Motivation to Engage in HIV Prevention

For subjective norms regarding HIV prevention acts, there was a significant main effect of time [$b = 0.15$, $p < .01$, 95%

Table 1 Internalized stigma as a predictor and moderator of treatment outcomes

Outcome variable	Pre-treatment		Post-treatment		Time (main effect)			IS (main effect)			Time × IS (interaction effect)		
	M	SD	M	SD	Est.	*p*	95% CI	Est.	*p*	95% CI	Est.	*p*	95% CI
% condomless anal sex partners	0.90	0.26	0.86	0.33	−0.04	0.029	[−0.08, −0.004]	0.08	0.141	[−0.03, 0.19]	0.07	0.046	[0.001, 0.14]
Subjective norms regarding HIV prevention acts	3.82	0.61	3.96	0.60	0.15	0.006	[0.05, 0.26]	0.02	0.883	[−0.19, 0.22]	−0.21	0.035	[−0.40, −0.02]
Motivation to use condoms	4.22	0.93	4.04	1.07	−0.17	0.076	[−0.37, 0.02]	−0.37	0.028	[−0.69, −0.04]	0.03	0.878	[−0.32, 0.37]
Motivation to use relationship agreements	4.40	0.92	4.48	0.87	0.08	0.403	[−0.11, 0.28]	−0.37	0.012	[−0.66, −0.08]	−0.02	0.891	[−0.38, 0.33]
Motivation to get tested with one's partner	4.70	0.64	4.77	0.56	0.05	0.454	[−0.09, 0.19]	0.01	0.924	[−0.17, 0.18]	0.24	0.049	[0.001, 0.49]
Motivation to use PrEP	4.02	1.19	4.28	1.08	0.25	0.038	[0.01, 0.48]	−0.27	0.155	[−0.65, 0.11]	0.21	0.299	[−0.19, 0.61]
Dyadic adjustment	123.24	12.67	122.89	15.01	−0.38	0.723	[−2.48, 1.73]	−6.90	0.005	[−11.71, −2.08]	0.40	0.834	[−3.34, 4.13]
Alcohol problems	6.25	4.86	5.73	4.58	−0.51	0.048	[−1.03, −0.004]	0.33	0.693	[−1.33, 1.99]	−0.29	0.532	[−1.21, 0.63]
Alcohol consumption	4.01	2.54	3.75	2.28	−0.22	0.247	[−0.60, 0.16]	−0.46	0.272	[0.03, 1.38]	−0.70	0.042	[−1.38, −0.03]

M mean, *SD* standard deviation, *CI* confident internal, *Est.* estimate, *IS* internalized stigma

Table 2 Simple slope analyses at conditional values

Outcome variable	Simple slope		
	b	*z*	*p*
% condomless anal sex partners			
Low IS	−0.08	−3.00	0.003
Mean IS	−0.04	−2.22	0.027
High IS	0.00	−0.14	0.892
Subjective norms regarding HIV prevention acts			
Low IS	0.27	3.50	0.001
Mean IS	0.15	2.80	0.005
High IS	0.04	0.53	0.595
Motivation to get tested with one's partner			
Low IS	−0.08	−0.82	0.412
Mean IS	0.05	0.75	0.453
High IS	0.19	1.91	0.056
Alcohol consumption			
Low IS	0.16	0.61	0.543
Mean IS	−0.22	−1.16	0.244
High IS	−0.60	−2.27	0.023

IS internalized stigma, *conditional values: low IS* −1 SD, *high IS* +1 SD

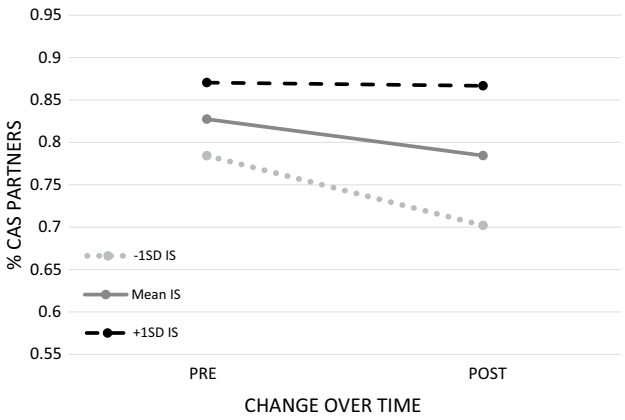

Fig. 1 Treatment change in the percentage of condomless anal sex (CAS) partners for high (+1 SD), mean, and low (−1 SD) internalized stigma (IS)

CI (0.05, 0.26)], indicating that subjective norms regarding HIV prevention acts increased from pre- to post-intervention. There was not a significant main effect of internalized stigma, but there was a significant time by internalized stigma interaction, which indicated that lower internalized stigma was associated with a larger increase in subjective norms regarding HIV prevention acts from pre- to post-intervention [$b = -0.21$, $p < .05$, 95% CI (−0.40, −0.02)] (see Fig. 2). Simple slope analyses demonstrated that subjective norms regarding HIV prevention acts significantly increased for those with low internalized stigma ($b = 0.27$, z = 3.50, p

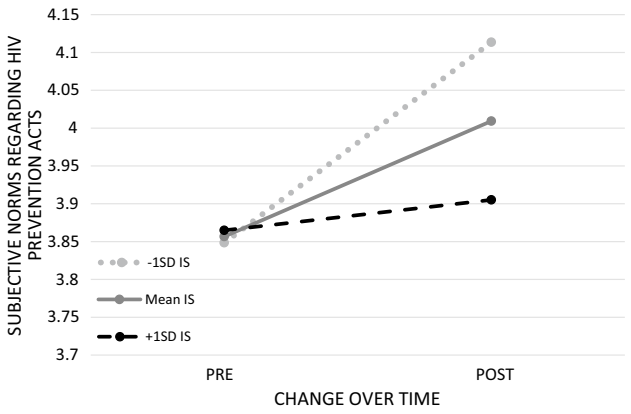

Fig. 2 Treatment change in subjective norms regarding HIV prevention acts for high (+1 SD), mean, and low (−1 SD) internalized stigma (IS)

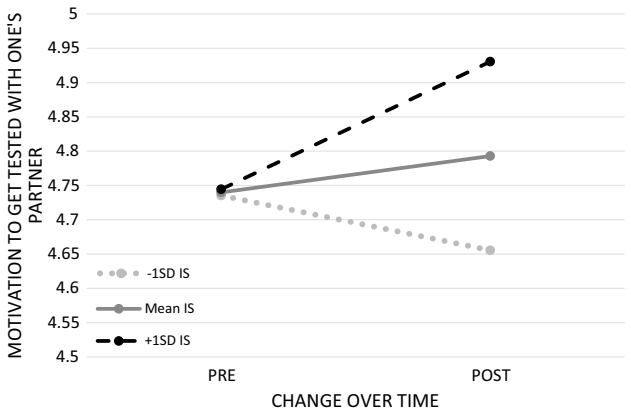

Fig. 3 Treatment change in motivation to get tested with one's partner for high (+1 SD), mean, and low (−1 SD) internalized stigma (IS)

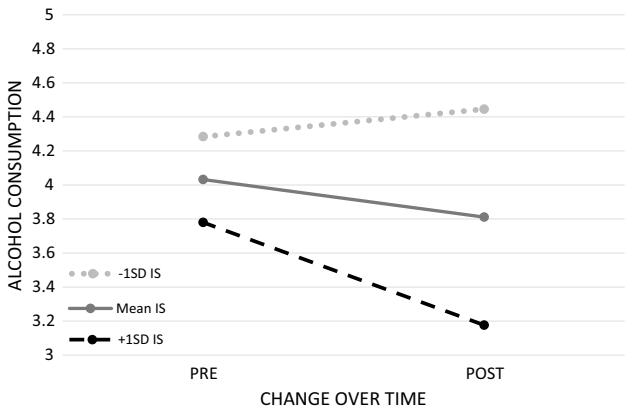

Fig. 4 Treatment change in alcohol consumption for high (+1 SD), mean, and low (−1 SD) internalized stigma (IS)

< .001) and average internalized stigma ($b = 0.15$, z = 2.80, $p < .01$), but not for those with high internalized stigma ($b = 0.04$, z = 0.53, $p = .60$).

For motivation to get tested with one's partner, there were not significant main effects of time or internalized stigma. However, there was a significant time by internalized stigma interaction, which indicated that higher internalized stigma was associated with larger increases in motivation to get tested with one's partner [$b = 0.24$, $p < .05$, 95% CI (0.001, 0.49)] (see Fig. 3). Simple slope analyses indicated that there was a marginally significant increase in motivation to get tested with one's partner from pre- to post-intervention for those with high internalized stigma ($b = 0.19$, z = 1.91, $p = .056$), but not for those with low internalized stigma ($b = -0.08$, z = −0.82, $p = .41$) or average internalized stigma ($b = 0.05$, z = 0.75, $p = .45$).

There were not significant time by internalized stigma interactions for the other dyadic motivation constructs (dyadic motivation to use condoms, to use PrEP, and to discuss relationship agreements). However, there were significant main effects of internalized stigma on dyadic motivation to use condoms [$b = -0.37$, $p < .05$, 95% CI (−0.69, −0.04)] and to discuss relationship agreements [$b = -0.37$, $p < .05$, 95% CI (−0.66, −0.08)], indicating that higher internalized stigma was associated with lower dyadic motivation to use condoms and to discuss relationship agreements. There was also a significant main effect of time on dyadic motivation to use PrEP [$b = 0.25$, $p < .05$, 95% CI (0.01, 0.48)], indicating that dyadic motivation to use PrEP increased from pre- to post-intervention.

Dyadic Adjustment

There was a significant main effect of internalized stigma on dyadic adjustment [$b = -6.90$, $p < .01$, 95% CI (−11.71, −2.08)], such that higher internalized stigma was associated with lower dyadic adjustment. In contrast, there was not a significant main effect of time and there was not a significant time by internalized stigma interaction.

Alcohol Use and Problems

For alcohol use, there were not significant main effects of time or internalized stigma. However, there was a significant time by internalized stigma interaction effect, which indicated that higher internalized stigma was associated with a larger decrease in alcohol use [$b = -0.70$, $p < .05$, 95% CI (−1.38, −0.03)] (see Fig. 4). Simple slope analyses demonstrated that alcohol use significantly decreased for those with high internalized stigma ($b = -0.60$, z = −2.27, $p < .05$), but not for those with low internalized stigma ($b = 0.16$, z = 0.61, $p = 0.54$) or average internalized stigma ($b = -0.22$, z = −1.16, $p = .24$). In regard to alcohol problems,

there was a significant main effect of time [$b = -0.51$, $p < .05$, 95% CI (-1.03, -0.004)], indicating that alcohol problems decreased from pre- to post-intervention. In contrast, there was not a significant main effect of internalized stigma and there was not a significant time by internalized stigma interaction. Of note, in the main outcome paper [5], the intervention effect on alcohol problems was only marginally significant. This difference is likely due to the fact that the current analyses included variables that were not included in the main outcome paper analyses (internalized stigma and the time by internalized stigma interaction).

Discussion

The goal of the current study was to examine the influence of self-reported internalized stigma on the efficacy of the 2GETHER intervention—an HIV prevention and relationship education program for young male couples [5]. Overall, we found evidence that internalized stigma did have an influence on the extent to which young male couples benefited from the intervention, though the direction of the effect differed depending on the outcome. In some cases, internalized stigma appeared to impede the ability of participants to change health behaviors, while in other domains, those with higher internalized stigma actually benefited more from the intervention.

First, the 2GETHER intervention led to a decrease in the percentage of CAS partners and an increase in subjective norms regarding HIV prevention acts for men with low and average internalized stigma, but not for men with high internalized stigma. These findings are consistent with Huebner and colleagues' finding that a single session, group-based HIV prevention program for MSM led to smaller increases in condom use self-efficacy for men with higher self-reported internalized stigma [7]. Together, these findings suggest that group-based interventions may present barriers to learning HIV risk reduction skills for MSM with higher internalized stigma. Huebner and colleagues also found that self-reported internalized stigma was associated with feeling less similar and relating less well to other MSM participating in the single session, group-based HIV prevention program [7]. As such, it is possible that preoccupation with internalized negative beliefs prevents MSM from learning during group-based HIV prevention. Although speculative, it is also possible that men with higher internalized stigma perceive HIV prevention information as less relevant to them compared to their peers, leading to less engagement with and benefit from the material. Further, previous research has demonstrated that negative feelings about being gay are associated with concerns about violating traditional masculine ideals [42], and endorsement of masculine norms has been implicated as a risk factor for negative health outcomes among men [43]. Therefore, endorsement of masculine norms and concerns about violating them may help to explain our findings that the 2GETHER intervention did not improve sexual health outcomes (i.e., the percentage of CAS partners, subjective norms regarding HIV prevention) for men with high internalized stigma. It will be important for future research to examine the mechanisms through which internalized stigma reduces the benefits of HIV prevention programs for young MSM and male couples.

Of note, these findings are inconsistent with Millar and colleagues, who found that an LGB-affirmative mental and behavioral health intervention for gay and bisexual men led to larger reductions in CAS with casual partners for men with higher internalized stigma [6]. Several methodological differences between the studies may account for their discrepant findings. First, Millar and colleagues examined the influence of internalized stigma on the effects of an intervention that was specifically designed to reduce stigma-related stress (e.g., internalized stigma). By directly targeting negative internalized beliefs, their intervention may have led to a reduction in these beliefs and, in turn, a reduction in CAS with casual partners for those who began the intervention with higher negative internalized beliefs. It is also possible that men with higher internalized stigma are more comfortable participating in one-on-one interventions, like the intervention in Millar and colleagues' study, than group interventions like 2GETHER and, as such, benefit more from one-on-one interventions. Finally, in Millar and colleagues' study, internalized stigma was only associated with intervention effects on CAS with casual partners when it was assessed using an implicit measure, not when it was assessed using an explicit (self-report) measure, as was used in the current study. It is possible that implicit and explicit internalized stigma have different influences on the extent to which behavioral health interventions lead to reductions in CAS among MSM. This possibility is supported by evidence that implicit and explicit measures of internalized stigma are only modestly correlated [6, 30, 31] and they differ in their associations with other outcomes (e.g., heavy drinking, depression, anxiety, psychological distress) [6, 30]. Further, implicit and explicit internalized stigma may operate through distinct processes to influence distal outcomes. For example, one study found that implicit, but not explicit, internalized stigma was associated with psychological distress [30], and implicit attitudes are thought to be more sensitive to affective experiences than are explicit attitudes [44]. As such, implicit internalized stigma may be more likely to influence distal outcomes through affective processes. Explicit internalized stigma, in contrast, may be more likely to affect outcomes through non-affective processes. Future research should include measures of both implicit and explicit stigma to continue to understand their unique associations with treatment outcomes and their underlying mechanisms.

In contrast to our findings for the percentage of CAS partners and subjective norms regarding HIV prevention acts, we found that the 2GETHER intervention led to an increase in motivation to get tested with one's partner and a decrease in alcohol consumption for men with high internalized stigma, but not for men with low or average internalized stigma. Given that male couples report infrequent HIV testing [12, 13] and that many young MSM are HIV-positive and unaware of their status [14], there is a critical need to increase motivation to get tested with one's partner. Interacting with other young male couples, some of whom were HIV-positive, may have provided men with insight into the importance of getting tested. Given that internalized stigma is associated with HIV-related concerns [45], this experience may have been particularly motivating for men with higher internalized negative beliefs about gay and bisexual men, because their negative beliefs may have involved concerns about HIV. Further, in Session 4, facilitators emphasized the importance of HIV testing and participants who were HIV-negative or unsure of their status were offered couples-based HIV testing. Men with higher internalized stigma may have benefited more from receiving couples-based HIV testing during the intervention, because it may have reduced their concerns about HIV among gay and bisexual men and motivated them to continue to get tested with their partner in the future.

Although the primary goals of the 2GETHER intervention were to reduce HIV risk behavior and improve relationship functioning, the intervention also included content focused on the unique stressors affecting male couples and skills to cope with those stressors. Additionally, in Sessions 3 and 4, couples were able to discuss the impact of alcohol use on their relationships and to practice problem-solving if alcohol use was contributing to problems in their relationships. The present results indicate that the 2GETHER intervention led to a decrease in alcohol use, but only for men with high internalized stigma. This is consistent with previous evidence that an individual mental and behavioral health intervention for gay and bisexual men led to larger reductions in heavy drinking for those with higher self-reported internalized stigma compared to those with lower self-reported internalized stigma [6]. If some men in each of the interventions were using alcohol to cope with their internalized negative beliefs, then they may have learned alternative skills to cope with these beliefs.

The 2GETHER intervention led to an increase in dyadic motivation to use PrEP and a marginal increase in dyadic motivation to use condoms, but it did not lead to increases in dyadic adjustment or dyadic motivation to discuss relationship agreements. Further, internalized stigma did not moderate these effects. However, there were main effects of internalized stigma on dyadic adjustment, dyadic motivation to use condoms, and dyadic motivation to discuss relationship agreements (i.e., higher internalized stigma was associated with lower levels of each of these constructs). Therefore, internalized stigma may present a barrier to experiencing a satisfying same-sex relationship and to discussing condom use and relationship agreements with one's partner. Of note, given that the 2GETHER intervention did not lead to a reduction in the percentage of CAS partners for men with high internalized stigma, it is possible that internalized stigma is associated with lower motivation to use condoms with one's main partner as well as with outside partners. As such, lower motivation to use condoms in general may present a barrier to reducing CAS subsequent to couples-based HIV prevention. It is unclear why internalized stigma moderated the intervention effect on dyadic motivation to get tested with one's partner, but not the other dyadic motivation constructs. If these findings are replicated, then it will be important for future research to attempt to understand why internalized stigma is differentially associated with intervention effects on specific motivational constructs.

These findings point to potential refinements for couples-based HIV prevention. In order to increase dyadic motivation to use condoms, dyadic motivation to discuss relationship agreements, and relationship functioning (e.g., dyadic adjustment), couples-based HIV prevention programs may have to specifically target internalized negative beliefs about gay and bisexual men. Although the 2GETHER intervention addressed the unique challenges facing young male couples and skills to cope with those challenges, the content did not explicitly focus on reducing internalized negative beliefs. Therefore, drawing on cognitive-behavioral interventions focused on reducing stigma-related stressors [46], couples-based HIV prevention and relationship education programs may benefit from teaching young MSM to identify and challenge maladaptive beliefs related to their sexual orientation, and this may be especially important for MSM who begin the intervention with higher internalized stigma. In fact, a relationship education program for male couples [47] included a group exercise in which participants were asked to identify common stereotypes about couples and then to evaluate them against existing data, which usually refuted them. Given that internalized stigma is associated with negative relationship outcomes [48], interventions that reduce internalized stigma may indirectly improve relationship functioning as well.

The current findings should be considered in light of several limitations. First, the 2GETHER intervention was tested in an uncontrolled pilot trial with a short follow-up period. Current trials are underway to test the efficacy of the 2GETHER intervention compared to an active control condition and with a longer follow-up period. Data from those trials have the potential to improve our understanding of the extent to which couples-based HIV prevention and relationship education is effective for young male couples and the

role of internalized stigma in treatment effects. Second, our sample included young male couples in the Chicago area. As such, findings need to be replicated in larger, more representative samples, including older couples and couples in rural and suburban areas. Third, because we measured internalized stigma at baseline, but not at follow-up, we were unable to examine intervention effects on internalized stigma. It will be important for future tests of the 2GETHER intervention to examine whether or not the intervention leads to decreases in internalized stigma. Further, the average level of internalized stigma in our sample was relatively low and internalized stigma may have had more of an influence on treatment outcomes if participants reported higher levels. Still, a subset of participants reported relatively high levels and we found support for the influence of internalized stigma on treatment outcomes. It is also possible that, due to social desirability, participants were motivated to disagree with the items that assessed internalized stigma (e.g., "Sometimes I wish I were not gay"). Given that self-presentation concerns have less of an influence on implicit measures than explicit measures [49], it will be important for future research to include both. In fact, scholars have advocated for using both implicit and explicit measures as predictors of behavior, given that both demonstrate incremental predictive validity [50] and that they differ in their associations with other outcomes [6, 30]. Fourth, controlling for use of biomedical HIV prevention did not affect our results, but we were unable to account for adherence to PrEP/ARV and whether use of biomedical HIV prevention was concurrent with engagement in CAS. PrEP/ARV use and viral suppression were also self-reported rather than confirmed with laboratory testing. As such, it will be important for future research to collect more precise data on use of biomedical HIV prevention to further advance our understanding of the extent to which internalized stigma influences the efficacy of HIV prevention programs. Finally, future research should examine the processes through which internalized stigma influences treatment outcomes.

Despite limitations, the current findings add to the small, but growing, body of research demonstrating that internalized stigma has an influence on HIV prevention outcomes among young MSM. Our findings suggest that the influence of self-reported internalized stigma on HIV prevention outcomes is complex and depends on the specific outcome. Regardless, internalized stigma is an important factor to consider when evaluating the potential of an HIV prevention intervention to be helpful for a given individual. Further, our findings point to potential refinements for couples-based HIV prevention programs for young male couples. Integrating intervention techniques to reduce internalized stigma has the potential to increase the extent to which HIV prevention programs can reduce CAS and increase subjective norms regarding HIV prevention acts among young male couples. Given that men with high internalized stigma benefited more from the 2GETHER intervention in regard to motivation to get tested with one's partner and alcohol consumption, we need to understand the mechanisms underlying these associations to better inform treatment refinement. As researchers continue to refine HIV prevention interventions for MSM, including young male couples, it will be important to continue to examine who benefits most from such interventions. Doing so will ensure that interventions are delivered to those who need them and can benefit from them the most.

Acknowledgements We would like to acknowledge the various individuals who served as facilitators for this project (in addition to the authors): Ryan Coventry, David Drustrup, John Frank, Kelsey Howard, Darnell Motley, Jae A. Puckett, and Tyson Reuter. We would also like to acknowledge Samuel McMillen and Brian Mustanski for their support. Finally, we would like to thank the couples that participated in this study for their time.

Funding This study was funded by a grant from the Sexualities Project at Northwestern (PI: Newcomb). Brian Feinstein was supported by a grant from the National Institute on Drug Abuse (F32DA042708; PI: Feinstein). Michael Newcomb was supported in part by a grant from the National Institute on Drug Abuse (DP2DA042417; PI: Newcomb). The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies.

Compliance with Ethical Standards

Conflict of interest Brian A. Feinstein declares that he has no conflict of interest. Emily Bettin declares that she has no conflict of interest. Gregory Swann declares that he has no conflict of interest. Kathryn Macapagal declares that she has no conflict of interest. Sarah W. Whitton declares that she has no conflict of interest. Michael E. Newcomb declares that he has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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