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The contribution of stress, cultural factors and sexual identity on the substance abuse, violence, HIV and depression syndemic among Hispanic men

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Introduction

Racial and ethnic health disparities are an enduring public health problem in the United States, and are a priority for elimination under Healthy People 2020 – the guiding framework for disease prevention in the United States (U.S. Department of Health and Human Services, 2001). Limited progress has been made in racial/ethnic health disparities in the past 20 years, which is of grave concern considering the growing minority population is projected to surpass the majority by 2050 (U.S. Census Bureau, 2009). More research is needed to expand our understanding of why health disparities occur and to inform innovative approaches to address and evaluate these.

A syndemic orientation to understanding health disparities has emerged as a promising approach to understanding and addressing health disparities (Gonzalez-Guarda, 2009). The syndemic approach is one that considers the complex relationships among co-occuring epidemics and the social links that tie these together (Singer, 2003). The lived experiences of individuals within cultural groups, including their exposure to stress and socio-cultural factors, are important predictors of health disparities in the U.S. Individuals of Hispanic/Latino descent (herein referred to as Hispanics), the largest and fastest growing minority group in the U.S., experience a unique set of stressors and socio-cultural factors that serve as risks or protective factors for health disparities (Gonzalez-Guarda, Florom-Smith & Thomson, 2011). The purpose of this study was to test the syndemic model with substance abuse, violence, HIV and depression among Hispanic men, and to test whether stress and other sociocultural factors including, acculturation, family support, and sexual orientation, predict this syndemic.

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Background

The substance abuse, violence, HIV and depression syndemic among Hispanics

Health disparities are a result of the social determinants of health and complex interactions among social and physical environmental factors, including access to resources such as money and power that influence where people live, work and play (World Health Organization, 2005). One approach to understanding health disparities that is increasingly obtaining attention from health care providers, public health professionals and researchers alike, is the syndemic orientation (Gonzalez-Guarda, 2009). Syndemics are co-occuring epidemics or conditions that interact with one another to disproportionately impact the morbidity and mortality of marginalized communities. Important to the syndemic orientation is the idea that health conditions (e.g., diseases, health related behaviors) interact with social conditions (e.g., poverty, discrimination) in influencing the heightened susceptibilities to disease and disease burden in vulnerable communities (Singer, 2006).

The first syndemic that was identified was substance abuse, violence and AIDS syndemic (SAVA; Singer, 1996). SAVA was coined as a result of research supporting the inseparable nature of substance abuse, violence and AIDS among a marginalized community in inner-city Hartford, Connecticut and the notion that it was impossible to understand any of these conditions (e.g., AIDS) without understanding interactions with the other two (e.g., substance abuse, violence) (Singer, 2009). Gonzalez-Guarda, Florom-Smith and Thomas (2011) expanded upon SAVA by presenting a comprehensive model for understanding the intersection of substance abuse, violence, risk for HIV, and depression among Hispanics. This model drew upon an extensive body of literature documenting the strong relationships among these conditions and the socio-environmental, cultural, relationship and individual level factors that served as common risk or protective factors for this syndemic. This model was then tested empirically in a follow-up study using a sample of community dwelling Hispanic women. Findings supported the model that an underlying syndemic factor existed, and that this factor was more common among Hispanic women with socioeconomic disadvantages than those that did not have these (Gonzalez-Guarda, McCabe, Florom-Smith, Cianelli, & Peragallo, 2011). De Santis and colleagues (2011; 2012) used the syndemic model to test the relationship of mental health (depressive symptoms, self-esteem, and substance abuse), eating attitudes and behaviors, body image, and sexual behaviors among a sample of 100 community-dwelling Hispanic men who have sex with men (MSM). Eating attitudes and behaviors were predictive of depressive symptoms, low self-esteem, substance abuse, lower body image, and high risk sexual behaviors. The authors concluded that healthcare providers need awareness of these clustering health conditions among Hispanic MSM. Nevertheless, the syndemic factor has not been tested among a community sample of Hispanic men with varying sexual orientations. This is important given the disparities experienced by minority MSM (Mustanski, Andres, Herrick, Stall & Schnarrs, 2014).

Stress

One of the most salient experiences that contribute to vulnerability in the lives of minorities is stress. Chronic stress in the lives of any individual has effects on health outcomes and premature death (Williams, 2010). Chronic stress induces a physiological cascade that

results in higher allostatic loads, vascular and metabolic abnormalities and early cellular death, which subsequently predisposes individuals to excess morbidity and premature death (Juster, McEwen & Lupien, 2010; McEwen & Wingfield, 2010). Racial and ethnic minorities in the U.S. are disproportionately exposed to chronic socioeconomic stressors that are associated with health disparities (Warnecke et al, 2008). It is important to understand the nature of these stressors in order to develop prevention programs that can promote health equity.

Although Hispanics represent a heterogeneous group of individuals from diverse backgrounds, researchers have attempted to capture some of the common stressors experienced by this diverse group. These stressors include challenges related to immigration, including language barriers, difficulty obtaining documentation status, cultural shifts in values, beliefs and behaviors that can challenge traditions in the family, parenting challenges, marital stress, and economic hardships. Although other racial and ethnic minority groups may also experience some of these same stressors, the unique configuration of these has been labeled Hispanic Stress (Cervantes, 1991).

Hispanic Stress has been linked to health disorders and diseases. For example, in a cross-sectional, community based study of a largely immigrant Hispanic sample of women, Hispanic stress, along with years in the U.S., education, support from the family and acculturation, explained 61% of the variance in a syndemic comprised of substance abuse, violence, risky sexual behaviors and depression. Importantly, Hispanic stress had the strongest effect on the syndemic, explaining nearly half the variance in the syndemic factor (Gonzalez-Guarda et al., 2013). However, the study by Gonzalez-Guarda and colleagues (2013) did not identify which of the stressors included in the Hispanic Stress concept were most harmful. More research is needed to identify the types of stressors that are most harmful for Hispanics so that interventions could be designed to specifically address these.

Cultural factors

Stress does not influence the lives and health of the Hispanic community in isolation. Additional culturally related factors work in concert to ameliorate or aggravate risk for the substance abuse, violence, risk for HIV and depression syndemic among Hispanics. Cultural factors may include shared world-views that inform symbols, beliefs, values, norms and behaviors (Napier et al., 2014). Acculturation and *familism* are two cultural factors identified in the syndemic model that can help explain cultural beliefs, values, and behaviors that influence the syndemic among Hispanics (Gonzalez-Guarda, Florom-Smith & Thomas, 2011). These two factors are also important to consider because they have been noted to change over time, thus representing opportunities for intervention (Dillon, De La Rosa & Ibanez, 2013).

Acculturation—Acculturation is an important and complex cultural process that involves multiple dimensions, and has been found to contribute to the health and well-being of Hispanic in the U.S. (Cunningham, Ruben & Narayan, 2008; Lara, Gamboa, Kahramanian, Morales & Bautista, 2005). Definitions of acculturation as a construct continues to evolve but remains comprised of a fluid process that involves extremes between at least two

dimensions- how much one adopts the culture of the receiving country (e.g., *Americanism*) and how much maintains the culture of origin (e.g., *Hispanicism*) (Horevitz & Organista, 2013; Marin & Gamba, 1996). Most of the research exploring the relationship among acculturation and substance abuse, violence, risk for HIV and depression among Hispanics has explored the one dimension of acculturation that is concerned with the adoption of the host country. A review of studies showed consistent evidence for relationships between higher levels of acculturation to the American culture and several health outcomes, including more risky behaviors, poor mental health outcomes, and higher alcohol/drug use (Lara et al., 2005). Yet, in a recent study of community-dwelling Hispanic women exploring the relationship among Americanism, *Hispanicism* and the substance abuse, violence, HIV and depression syndemic, researchers found that although Americanism was not a significant predictor, *Hispanicsm* had a protective effect. This study will examine the same relationships among Hispanic men (Gonzalez-Guarda et al., 2003).

Familism: Familism, an important cultural value among Hispanics, is the normative belief that the family is central to the individual and that family has important obligations in regards to the provision of material, financial and emotional support for both immediate and extended family members (Ayon, Marsiglia & Bermudez-Parsai, 2010; Sabogal, Marin, Otero-Sabogal, Marin & Perez-Stable, 1987). Such belonging institutes a level of cohesiveness that provides a feeling of safety and mitigates feelings of loneliness and isolation (Diaz, 1998; Meyer and Champion, 2008). This phenomena has been found to be protective against maladaptive behaviors that may result from stress and the acculturation process. For example in a study including 150 parent-youth dyads, Familism was protective against depressive symptoms for parents, and depression and anxiety symptoms for youth (Ayon, Marsiglia & Bermudez-Parsai, 2010). Recently, researchers also documented that family support, an important component of Familism, was protective against the substance base, violence, HIV and depression syndemic among community dwelling Hispanic women (Gonzalez-Guarda, Vermeesch, McCabe et al., 2013). Despite our current understanding regarding the protective effect that Familism has on Hispanic families, the impact that this cultural value has on syndemics among adult Hispanic men is not as well understood.

Sexual Orientation

Syndemics appear to disproportionally affect sexual minorities. In a study using pooled data from the Youth Risk Behavior Survey of 2005 and 2007, men who had sex with men and women (MSMW), and men who have sex with men (MSM) were more likely to experience a syndemic of psychososcial health issues than men who had sex with women (MSW) (Mustanski, Andres, Herrick, Stall & Schnarrs, 2014). Although the syndemic factor measured in this study was associated with increased odds for a serious suicide attempt, the odds were greater for MSM (*OR*= 5.75) and MSMW (*OR*= 5.08), than for MSW (*OR* = 3.47). Halkitis et al. (2013) further explored syndemics among gay men, surveying 598 gay and bisexual men. The sample consisted of 28.3% Hispanic men. The researchers reported that mental health burden, drug use, and unprotected sex were inter-related, and that effective HIV prevention and HIV care for MSM need to address sexual risk, mental health and drug use simultaneously.

Risks for syndemics appear to be further exacerbated among sexual minorities from racial and ethnic minority groups with dual "minority" status (Meyer, 2003). Researchers are beginning to apply syndemic theory to understand and address the vulnerabilities sexual minorities from racial and ethnic minority groups. For example, Dyer and colleagues (2012) applied syndemic theory to Black MSM and noted significant and independent relationships among substance use, intimate partner violence, sexual compulsiveness, depressive symptoms and stress. Black MSM who reported three of more of these conditions were about 3.5 times at greater odds of engaging in uprotected sex than Black MSM reporting two of fewer health conditions.

Hispanics who identify as gay or bisexual experience a unique confluence of risk factors that are likely to influence the nature of syndemics in this population. In a study of 100 Hispanic MSM that studied the relationship of eating attitudes and behavior, alcohol abuse, body image concerns, mental health (depressive symptoms and self-esteem) and sexual risk behaviors, 13% of the sample was at risk for an eating disorder, 18% were at risk for alcohol abuse, 29% were at risk for body image disturbance, 25% were at risk for depression, and 12% reported low self-esteem. All variables were correlated and were statistically significant predictors of sexual behaviors. The authors concluded that these variables need to be considered in tandem to address the health risks of Hispanic MSM (De Santis, Arcia, Vermeesch & Gattamorta, 2011). In a qualitative study of a community sample of Hispanic men who self-identified as gay or bisexual, substance abuse, violence and sexual risk emerged as intertwined phenomena described as "the tangled branches" (De Santis et al., 2014). Acculturation, cultural norms related to masculinity, discrimination, immigration and economic stressors, unstable relationships, peer influences and the lack of psychosocial support were all issues identified by the participants as serving as the "roots" to this problem in their community. Family rejection appears to play an important role in predicting negative health outcomes among Hispanic MSM. In a study with 224 White and Hispanic adults self-identifying as lesbian, gay, and bisexual with higher rates of family rejection were associated with poorer health outcomes (Ryan, Huebner, Diaz & Sanchez, 2009). More research is needed to illuminate how syndemics are shaped by the intersection of multiple identities (e.g., gay, Hispanic) and family dynamics among Hispanic gay men.

Hypotheses

This study will extend the theoretical syndemic model for Hispanic adult men. Based on our theoretical model and literature review we proposed the following hypotheses: 1) A single syndemic factor will explain covariance in multiple conditions, including substance abuse, violence, risk for HIV and depression, and 2) Hispanic stress, Familism, acculturation and sexual orientation will predict this syndemic factor among Hispanic adult men.

Methods

Participants

The present study reports on data analyses conducted on cross-sectional surveys administered to 164 Hispanic heterosexual and MSM who participated in the quantitative phase of Project VIDA (Violence, Intimate Relationships, and Drug Abuse). Project VIDA

was a mixed-method study that aimed to explore the relationships among substance abuse, violence, risk for HIV and mental health among adult Hispanic heterosexual and MSM. This study was conducted in Miami-Dade County, Florida between 2009 and 2011. Miami-Dade County has a large Hispanic population; about 50% of the county's residents are foreign-born. This county is unique not only because of its large Hispanic population, but because the majority of the county's Hispanics are Cuban (U.S. Census Bureau, 2014).

The mean age of the participants was 39.71 years (SD = 9.08, range = 18–55). In terms of country of birth, 24 participants (14.6%) were born in the U.S., while 140 participants (85.4%) were foreign-born. Years living in the U.S. ranged from less than 1 year to 54 years, with an average of 18.71 years (SD = 13.05). Number of years of education ranged from less than 1 year to 24 years (M = 12.49, SD = 3.65). A more complete description of the study's participants is reported elsewhere (Vasquez, Gonzalez-Guarda, & De Santis, 2011).

Procedures

Approval from the University Institutional Review Board was obtained prior to carrying out research related activities. Participants were recruited from various community-based sites in Miami-Dade County that provided health, social, or recreational services to Hispanic men. These sites included immigration offices, social service agencies, barber shops, gyms, home improvement stores, bars, clubs, and cafes. Members of the research team traveled to the community sites to post flyers and to distribute business cards. Potential participants at sites were approached by members of the research team and were screened for eligibility. Participants were eligible for inclusion if they met the following criteria: a) they were between the ages of 18 and 55 years; b) they self-identified as a Hispanic or Latino man; c) they self-reported sexual orientation; and d) they were residents of Miami-Dade County without immediate plans of relocating from the area.

Once participants met screening criteria, the men were provided with an appointment time to complete the study. The study was conducted in either English or Spanish, based on the participant's preference. Participants were provided with the option of completing the study at a private office on the University campus, or arranging a home visit with a member of the research team. During the appointment, participants completed a battery of standardized instruments. Participants were given the option of having the instruments self-administered, or administered by a member of the research team. When data were collected at the University site, a computerized data collection system was used to record data from participants. When data were collected at home, paper versions of the instruments were used to record data. Data collected on paper were then entered into the computerized data collection system. At the completion of the appointment, each participant that finished the study was provided with five business cards and encouraged to distribute them to potential participants.

Measures

Syndemic factor—The measures used to measure the syndemic factor were similar, but not identical, to measures used in a previous examination of this factor in a sample of Hispanic women (González-Guarda, McCabe, Florom-Smith, Cianelli, & Peragallo, 2011).

Unless otherwise noted, the measures for the current sample were identical to the sample of Hispanic women.

Substance Abuse: An adapted form of the 9-item Substance Abuse Behavior questionnaire (Kelly et al, 1994) was administered. For this study, a scale was created with three items: frequency of alcohol and illicit drug use (2 questions) and being drunk or high before sex (1 question) in the past three months. An example item is, "In the past 3 months, how often have you been drunk on alcohol?" The response choices were *never, once or twice, about once a week*, or *several times a week.* This subscale had good reliability (Cronbach's α = .77) in this sample.

Violence: Three variables were used to measure exposure to violence: lifetime exposure to abuse, community violence, and partner violence. All three variables were from the Violence Assessment, a measure developed for a previous HIV risk reduction efficacy trial (Peragallo et al., 2005) and adapted in a subsequent pilot study (González-Guarda et al., 2008). The lifetime exposure to abuse scale asked whether (response choices were *yes* or *no*) the participant had been physically, sexually or psychologically abused during childhood (before the age of 18) or adulthood by someone other than a romantic partner. For analysis, it was coded as 1 = yes to any item, 0 = no to all items. These items had acceptable internal consistency (Cronbach's α = .74). Community violence (one item) asked participants to report if they had ever lost a close friend or relative to a violent death, such as suicide, homicide or substance abuse related accident. Partner violence was measured with eight items describing partner behaviors, e.g., screaming or yelling, forcing sex; and participant responses, e.g. seeking medical attention because of partner behavior, fearing consequences of seeking help. The partner violence measure had satisfactory reliability (Cronbach's α = .79). In the original study, partner violence was assessed with a version of the Conflict Tactics Scale (Straus, 1979).

Risk for HIV infection: Three variables were used to measure risk for HIV infection: consistent condom use, partner's risk for HIV infection, and STI history. The Partner Table, which gathered information regarding the characteristics (e.g., demographics) and sexual behaviors in the context of the participants' most recent intimate relationship (González-Guarda et al., 2008) was used to capture consistent condom use and most recent partner's risk for HIV infection. Participants reported frequency of condom use during vaginal sex or anal sex with their most recent partner. Consistent condom used was defined as reporting "always" using condoms (1 = always, 0 = sometimes or never). Consistent condom use was measured with only vaginal condom use in the previous study; anal sex was added for this sample. Partner risk was assessed with six items, which asked participants to report whether their partner was ever drunk or high (during and not during sexual intercourse, four items), ever injected drugs (one item), and had sex with IV drug users, men, or commercial sex workers (three items). An example item is "Did this partner ever have sex with men?" and all responses were either *yes* or *no*. This scale had poor reliability (Cronbach's α =.52), so we did not use this scale in current analyses, even though it was used in the previous study. Additionally, a health and sexual history was taken in which participants were asked their lifetime exposure to a list of sexually transmitted infections (STI). Participants reporting

diagnoses of one or more STI in their lifetimes were coded as positive (1 = positive, 0 = negative).

Depressive symptoms: The Center for Epidemiologic Studies Scale (CES-D; Radloff, 1977) was administered to assess depressive symptoms. This scale has 20 questions asking participants to report the frequency (*rarely or none of the time, some or a little of the time, occasionally or moderate amount of time, most or all of the time*) that they experience depressive symptoms (e.g., feeling lonely, having a hard time concentrating). Responses to these questions were added for a total score ranging from 0 to 40 points. In general, scores of 16 and above indicate a likelihood of clinical depression. This scale is widely used in population-based and community studies and has been translated and validated in Spanish (Roberts, 1980). The CES-D demonstrated strong reliability (Cronbach's α = .91) in this sample.

Hispanic Stress—The Hispanic Stress Inventory (HSI; Cervantes, Padilla, & Salgado De Snyder, 1991) was used to assess Hispanic Stress. The immigrant version of this scale was used. The original version consists of 73 items divided into five subscales (Economic Stress, Parental Stress, Family/Cultural Stress, Marital Stress, and Immigration Stress). Examples items include: "I have been discriminated against," for Immigration Stress, and "my spouse and I have disagreements about who should control the household money" for Family/ Cultural Stress. Respondents were asked first whether an event had occurred (*yes* or *no*), and then asked how much they were bothered by the event on a 5-point Likert scale (*not at all* to *extremely).* The Parental Stress subscale was not used in this study because many participants were not parents. These subscales demonstrated high reliability (Cronbach's α = .78, .82, .85, .90, respectively) in this sample. In the previous study a total stress score was created, but the four frequency subscales that summed the number of events that occurred were used separately in this study.

Familism—The Familism scale (Sabogal, Marín, Otero-Sabogal, Vanoss Marín, & Pérez-Stable, 1987) was created to assess Hispanic cultural value that emphasize the important role of family and loyalty and responsibility to family. The scale has 15-items organized into three subscales: 1) Family Obligations (6 items) indexes perceived obligation to assist the family (e.g., "A person should share her home with uncles, aunts or first cousins if they are in need"), 2) Family Support (3 items) assesses beliefs that the family should be a source of social support (e.g., "One can count on help from her relatives to solve most problems"), and 3) Family as Referent (5 items) assesses the belief that relatives should be used as behavioral and attitudinal referents (e.g., "One should be embarrassed by the bad things done by members of his family"). Participants could respond using a 5-point Likert scale, from *Strongly disagree* to *Strongly agree.* Only one subscale, Family Support, was used in this study as in the previous study. Reliability was acceptable for Family Support (Cronbach's α = .70) in this sample.

Acculturation—The Bidimensional Acculturation Scale (BAS; Marin & Gamba, 1996) has 24 items that measures how acculturated Hispanics are to the U.S. culture (Americanism, e.g., How often do you speak in English with your friends?) and their culture

of origin (*Hispanicism*). All responses were on a 4-point Likert scale from *Almost never* to *Almost always.* To score the BAS the 12 items that measure each cultural domain are averaged separately. In this sample, the BAS demonstrated a high reliability for both the *Hispanicism* and Americanism subscales (Cronbach's α = .90 and .96, respectively). In the previous study, we used Berry's (1997) framework to create three mutually exclusive categories: separated (high *Hispanicism*, low Americanism), assimilated (high Americanism, low *Hispanicism*), and Integrated/Bicultural (high *Hispanicism*, high Americanism). For analysis with this sample, we used the continuous *Hispanicism* and Americanism scales because there were very few participants in the assimilated group, i.e., almost all participants had high *Hispanicism*.

Sexual Identity—A single question, "How do you identify yourself," was added to the demographic measure to assess sexual identity. For analysis, two dummy-coded variables were used to represent sexual identity, homosexual (1) vs. heterosexual (0), and bisexual (1) vs. heterosexual (0). Sexual identity was not included in the previous study.

Income—Demographic information was collected with a form designed for El Centro studies and adapted for this study. A single item asked about income, "Last month, what was the total amount of money you and your family lived on." Participants could choose the following 11categories: less than $5000, $5000–9999, $10,000–14,999, $15,000–19,999, $20,000–24,999, $25,000–29,999, $30,000–34,999, $35,000–39,999, $40,000–44,999, $45,000–49,999, $50,000 or more. A dummy-coded variable representing income was created using monthly family income (1 = above $500/month, 0 = less than $500/month).

Analysis

We tested our primary hypothesis in a series of two stages using Mplus 7.2 (Muthén & Muthén, 2014). Mplus allowed for modeling with categorical indicators using a weighted least square parameter estimator (WLSMV) using a diagonal weight matrix with standard errors and mean- and variance adjusted chi-square test statistic that uses a full weight matrix. In Phase 1, Confirmatory Factor Analysis (CFA) was used to test the a priori theory that substance abuse, violence, risk for HIV, and depressive symptoms were aspects of a single underlying phenomena, i.e., a Syndemic factor, in the current sample. Model fit was evaluated with the χ^2 test, CFI, and RMSEA. Good fit with the χ^2 is a non-significant result. We used cutoffs of CFI > .95 and RMSEA < .05 to indicate good fit. In Phase 2, we tested predictors of the Syndemic Factor. The latent Syndemic factor identified in Phase 1 was regressed on each predictor.

Results

Three variables, partner violence, depressive symptoms, and substance use, were positively skewed. Log transformations effectively reduced the skewness of these variables. The remaining four variables (community violence, STI history, and consistent condom use) were dichotomous. The initial model with a single latent factor (Model 1) had good fit to the data, χ^2 (14) = 15.00, p = .378, CFI = .966, RMSEA = .021. Table 2 shows unstandardized and standardized loadings for indicators of the syndemic factor. All the items had significant

loadings except two: consistent condom use, $b = -0.15$, $SE = 0.26$, $p = .564$, and substance use, $b = 0.07$, $SE = 0.04$, $p = .076$. We re-estimated the model (Model 2) with consistent condom use and substance use dropped. This model also fit the data, χ^2 (5) = 6.68, $p = .245$, CFI = .946, RMSEA = .045, and all loadings were significant.

The fit of the model with predictor variables was good, χ^2 (45) = 45.80, $p = .439$, CFI = .972, RMSEA = .011. Table 3 shows the unstandardized and standardized coefficients for predictors of the syndemic factor. The syndemic factor was not related to occupational stress, marital stress, immigration stress, Hispanicism, Americanism, bisexual identity, or income. Family stress, $b = 1.80$, $SE = 0.06$, $p = .001$, family support, $b = -0.63$, $SE = 0.25$, $p = .012$, and homosexual identity, $b = 0.63$, $SE = 0.30$, $p = .037$, were significant predictors of the syndemic factor. Combined, these variables accounted for a large amount (52%) of the variance in the syndemic factor. The Figure shows the final SEM model with the syndemic factor model and predictors.

Discussion

The results from this study support the intertwined nature of substance abuse, violence, HIV risk and depressive symptoms among Hispanic men, indicating a higher level phenomena- a syndemic factor. Specifically, these results replicated a previous test of the syndemic model with Hispanic women in sample of Hispanic men. This study also helped describe the relationship between Hispanic stress and the syndemic factor among Hispanic men by exploring the relationships that specific types of stressors had with the syndemic factor. However, this study also expanded upon our current understanding regarding syndemics and factors that influence these among Hispanic men. Because in this study substance abuse and partner risk had to be dropped from the syndemic factor, it provided evidence that the syndemic may either configure differently or need to be measured differently for Hispanic men. It also helped identify the specific types of stressors that Hispanic experience that are most associated with the negative health outcomes within the syndemic factor in this population. The results suggested that family served as both a significant risk and protective factor for this syndemic. This study also helped provide further support for the risk endured by Hispanic men that self-identify as gay.

The results of this study corroborate and expand upon the results of others who explored relationships among substance abuse, violence, HIV and depression among Hispanics. In a study including a community sample of Hispanic women, the substance abuse, violence, HIV risk, depression syndemic model was also supported (Gonzalez-Guarda et al., 2011). However, the syndemic factor in the study with Hispanic women appeared to configure in slightly different way than the syndemic factor in this study with Hispanic men, despite the fact that similar measures and analytic procedures were used. In the analysis with Hispanic women, substance abuse and the partner risk for HIV (e.g., history of partner's injection drug use, sex with commercial sex workers) were significant indicators of the syndemic factor, while in this study with Hispanic men, substance abuse and partner risk were removed from the model to improve model fit. This may have been because an adapted version of a substance abuse scale, which only used three items, was used. This may not have allowed for enough variability in reported substance abuse behaviors to be observed.

The measure for partner risk may also not capture important differences in partner risk behaviors according to sexual orientation. Future research exploring the syndemic among men should use a more sensitive measure to capture more variability in substance abuse behaviors and partner risk for heterosexual, gay and bisexual men.

The syndemic factor was greater for Hispanic men self-identifying as gay when compared to men who self-identified as heterosexual ($b = 0.63$, $SE = 0.30$, $p = .037$). This corroborates the findings from other researchers that have identified the risk of syndemics among sexual minorities (Mustanski, et al., 2014) and expanded upon the nature of the substance abuse, violence, HIV and depression syndemic among gay men from racial and ethnic minority groups (Dyer et al., 2012; De Santis et al., 2014). This disparity in the syndemic factor among Hispanic gay men may be the result of cultural expectations supporting risk behaviors such as substance abuse and high risk sexual activity, discrimination related to intersecting ethnic and sexual identities, immigration related issues, and the failure to recognize their own sexual behaviors as placing them at risk for HIV infection (De Santis et al., 2014). Although some of the nuances in the syndemic factor have been described by researchers of the syndemic among minority MSM (Dyer et al., 2012; Mustanski, et al., 2014), more research is needed to understand the universal and unique experiences of Hispanic MSM with the phenomena of syndemics.

It is interesting to note that although multiple sources of stressors were measured, Family/ Cultural Stressors was the only form of Hispanic stress that was measured in this study that significantly predicted the syndemic factor among Hispanic men. This may be a result of various factors. First, the study was carried out in an area of the country where the Hispanic community constitutes a majority, where Hispanics have a strong political base, and where many Hispanic immigrants are joined with their families and friends. As such, Hispanic immigrants may have more access to economic and emotional resources, pathways to citizenship, and access to jobs. These conditions may mitigate the other forms of Hispanic stress, immigration and financial stress. Despite this, stress related to changes in family dynamics and culture was a significant predictor of the syndemic. Familism, one of the most salient and protective cultural factors among Hispanics, appears to diminish as Hispanics acculturate to mainstream U.S. culture (Dillon, De La Rosa & Ibanez, 2013). This may result from separation from family during immigration and challenges to traditional family customs that are a consequence of normative values in the U.S. that provide a greater emphasis on work than family. These have been noted as significant sources of stress among Hispanic men and women in South Florida (Gonzalez-Guarda et al., 2010; Gonzalez-Guarda et al., 2011).

Additionally, family and cultural stress may be a result of changes that occur to the family structure that challenge traditional norms and practices in Hispanic families. For example, in qualitative studies conducted with Hispanic women and men and south Florida, participants have noted that it is easier for female immigrants to find jobs than males because females were more likely to obtain jobs caring for children and cleaning homes. As such, females often became the primary breadwinner of the family and begin taking on decision making responsibilities that traditionally belonged to men. This serves as a significant source of stress in the family and may lead to maladaptive behaviors (Gonzalez-Guarda, et al., 2010;

2011). More research is needed to describe the nature of these family and cultural changes, how they influence the syndemic factor and how these may be moderated by sexual orientation and family support.

There are several limitations to this study. This is a cross-sectional study about relationships amongst complex behaviors, conditions, stressors and supports among Hispanic men between the ages of 18 and 55. The complex nature of these variables and limited size of the sample, especially when considering sub-samples (e.g., those identifying as bisexual, $n = 20$), may have contributed to type II error. Further, the non-random sampling may have violated the assumption of independence. Unfortunately, we did not collect information to allow this assumption to be tested. Longitudinal research with a large and diverse sample is needed to describe the pathways amongst the conditions included in the syndemic factor and the risk and protective factors that influence these over time according to sub-groups such as sexual orientation, country of origin and age ranges. Second, as mentioned previously, the study took place in a unique area of the U.S. where there is a minority majority. Stress is likely to play a different role in other communities in the U.S. where the Hispanic population constitutes a smaller proportion of the population. More research is needed to describe how environmental factors interact with the stressors measured in this study to influence the syndemic factor and how this may vary across diverse Hispanic communities throughout the U.S. Finally, this study only examined the influence that Hispanic stress has on behaviors and mental health conditions that were measured as indicators of the syndemic factors. Hispanic stress is likely to have a physiological impact on individuals, which may in turn influence behaviors, mental health conditions and other physical conditions that contribute to health disparities in this population. Future research is needed to expand our current understanding on syndemics and variables that influence these among Hispanics.

This study has important implications in addressing health disparities among Hispanics. Stress, specifically family and cultural stress, plays an important role in predicting the syndemic factor among Hispanic men. In this study family and cultural stress was measured using the Hispanic Stress Inventory which captures stress in the family dynamics which are influenced by changes in the dynamics of the family such as decision making roles among partners, and challenges in childrearing that may result from acculturation such as how strict to be with children (Cervantes et al., 1991). Interventions that promote healthy ways for individuals and families to adjust to new family dynamics, culture and context should be explored as a means of addressing health disparities among Hispanics. One such intervention that has been demonstrated to be effective in reducing family and cultural stressors and preventing drug abuse and HIV among Hispanic adolescents is Familias Unidas (Pantin et al., 2009). Such interventions should be evaluated for their long-term impact into adulthood. Also, given that this study supports the syndemic factor among Hispanic men who identified as homosexual and that family rejection of adults from sexual minorities is a predictor of negative health outcomes (Ryan et al., 2009), it is particularly important to develop and test family based interventions to help families accept and support children identifying with a minority sexual orientation. Prevention programs, intervention strategies and policies are needed to ensure that Hispanic families maintain their strong supportive ties to their families despite the multiple stressors that influence their lives. This

may represent the most powerful, yet often overlooked or undervalued strength of the Hispanic community.

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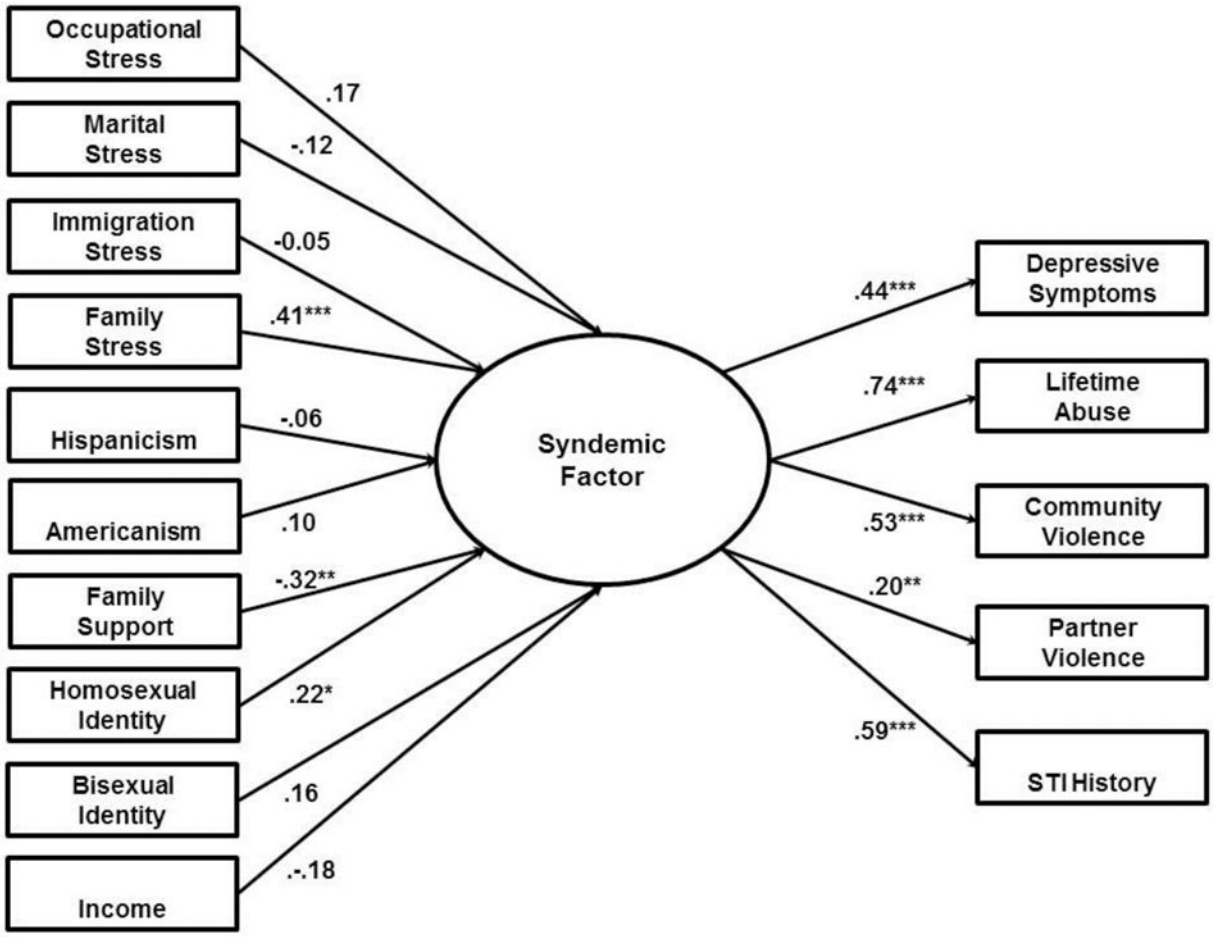

Figure 1.

The left side of the diagram shows relationships between hypothesized predictors of the syndemic factor. The right side shows the relationships in the syndemic factor measurement model. These loadings differ slightly from Model 2, which did not include predictor variables. This model had a good fit the data. χ^2 (45) = 45.80, p = .439, CFI = .972, RMSEA = .011. *p < .05, **p < .01, ***p < .001.

Table 1

Participant Characteristics and Syndemic Indicators (N = 164).

Variables	*M or n*	*SD or %*
Age, *M, SD*	39.71	9.08
Years in U.S., *M, SD*	18.71	13.05
Years of Education, *M, SD*	12.49	3.65
Depressive Symptoms, *M, SD*	18.56	12.44
Substance Use, *M, SD*	4.42	2.67
Partner Violence, *M, SD*	0.44	1.16
Occupational Stress, *M, SD*	3.55	2.94
Marital Stress, *M, SD*	2.38	2.97
Immigration Stress, *M, SD*	4.72	4.76
Family Stress, *M, SD*	3.86	3.27
Hispanicism, *M, SD*	3.38	0.57
Americanism, *M, SD*	2.78	0.86
Family Support, *M, SD*	3.80	0.74
Employed, *n, %*	46	28%
Family Income above $500/month, *n, %*	92	56%
Experienced Community Violence, *n, %*	65	40
Lifetime Abuse, *M, SD*	70	43%
Positive STI History (lifetime), *n, %*	84	51%
Consistent Condom Use, *n, %*	25	15%
Homosexual identity, *n, %*	63	38%
Bisexual identity, *n, %*	20	12%

Note. Frequency (%) for positive answers shown for dichotomous variables.

Table 2

Unstandardized and Standardized Loadings for Indicators of the Syndemic Factor (N = 164).

	Model 1				Model 2			
Indicators	***b***	***β***	***SE$_b$***	***p***	***b***	***β***	***SE$_b$***	***p***
Depressive Symptoms	0.38	.48	0.10	<.001	0.33	.41	0.10	.001
Substance Use	0.07	.49	0.04	.076	–	–	–	–
Lifetime Abuse	0.64	.64	0.16	<.001	0.72	.72	0.18	<.001
Community Violence	0.43	.43	0.13	.001	0.40	.40	0.14	.003
Partner Violence	0.13	.28	0.06	.033	0.15	.31	0.06	.020
Consistent Condom Use	−0.15	−.15	0.26	.564	–	–	–	–
STI History	0.45	.45	0.15	.002	0.46	.46	0.15	.002

Note. Variance of the latent factor is set to 1. Model 1 Fit: χ^2 (14) = 15.00, p = .378, CFI = .966, RMSEA = .021. Model 2 Fit: χ^2 (45) = 45.80, p = .439, CFI = .972, RMSEA = .011.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 3

Unstandardized and Standardized Coefficients for Predictors of the Syndemic Factor (N = 146).

Predictors	***b***	***β***	***SE*$_b$**	***p***
Occupational Stress	0.09	.17	0.09	.303
Marital Stress	−0.06	−.12	0.06	.345
Immigration Stress	−0.01	−.05	0.05	.796
Family Stress	**0.18**	.41	**0.06**	**.001**
Hispanicism	−0.15	−.06	0.33	.664
Americanism	0.16	.10	0.27	.559
Family Support	**−0.63**	−.32	**0.25**	**.012**
Homosexual Identity	**0.63**	.22	**0.30**	**.037**
Bisexual Identity	0.78	.16	0.73	.289
Income	−0.53	−.18	0.30	.075

Note. Model Fit: χ^2 (45) = 45.80, p = .439, CFI = .972, RMSEA = .011.

Bold indicates significant coefficients.