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Risk Factors for Intimate Partner Violence Initiation and Persistence among High Psychosocial Risk Asian and Pacific Islander Women in Intact Relationships

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Abstract

Purpose—The present study identifies risk factors for intimate partner violence (IPV) initiation and persistence over three years in a high psychosocial risk Asian American and Pacific Islander (AAPI) sample of women with children living in Hawaii.

Methods—378 women in a 3-year relationship with the same partner reported IPV experiences at baseline and three years later. Baseline risk factors included characteristics of each woman, her partner, and their relationship. Bivariate and multivariate regression models were conducted to assess the influence of risk factors on the likelihood of experiencing IPV initiation and persistence.

Findings—Of women who experienced no physical violence at baseline, 43% reported IPV initiation. Of women who did experience physical violence at baseline, 57% reported IPV persistence. Being unemployed and reporting poor mental health at baseline are important risk

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factors for experiencing IPV initiation. Reporting frequent physical violence at baseline increases the likelihood of experiencing IPV persistence. Asian women were significantly less likely to report IPV persistence than other groups of women.

Conclusions—Our study indicates that among a high psychosocial risk sample of AAPI women there are different risk factors for IPV initiation and persistence. Future prevention and screening efforts may need to focus on these risk factors.

Introduction

More than 20% of American women have been physically assaulted by a current or former partner at some point in their lifetime, and more than 1.3 million women experience intimate partner violence (IPV) each year (Tjaden & Thoennes, 2000). Determining risk factors for the onset, or initiation, of IPV may inform both screening and development of prevention programs. Identifying risk factors for the continuation, or persistence, of IPV in a violent relationship may lead to focused and tailored intervention efforts. The present study identifies risk factors for IPV initiation and persistence over three years in a predominantly Asian American and Pacific Islander (AAPI) sample of women with children living in Hawaii.

Research on IPV initiation and persistence within relationships is limited. Rates of IPV initiation vary somewhat; in larger national surveys such as the National Survey of Families and Households (NSFH) and the National Family Violence Survey (NFVS), the initiation rate is between 4-16% over a 2 to 5 year period (Aldarondo, 1996; Jasinski, 2001a; Mouton et al., 2004). This is similar to rates in community samples, such as that of Coker et al which found an IPV initiation rate of 4% among a sample of women receiving health care from clinics in rural South Carolina (Coker et al., 2007). Rates of IPV persistence vary widely. Results from national surveys (e.g. NSFH and NFVS), indicate that IPV often persists in a third to more than half of violent relationships, including studies with five year follow-up periods (Aldarondo, 1996; Jasinski, 2001a; Wofford Mihalic, Elliott, & Menard, 1994; Connelly et al., 2006; Field & Caetano, 2005). In smaller community-based samples, the rates of IPV persistence also vary; Coker et al report that 37% of women who received health care in a rural clinic reported persistent IPV over three years and Quigley et al found this rate to be 76% among a sample of married couples (Coker et al., 2007; Quigley & Leonard, 1996). One study with a longer follow-up period found the IPV persistence rate to decrease substantially with time (Timmons Fritz & O'Leary, 2004).

It is important to discern the risk factors for both IPV initiation and persistence to help guide prevention and screening activities. Research has focused on identifying risk characteristics of the individual (female/victim) experiencing violence that puts one at risk for IPV initiation or persistence, such as age, ethnicity, socioeconomic status, and employment (Field & Caetano, 2003; Jasinski, 2001a; Johnson, 2003; Connelly et al., 2006; Aldarondo & Sugarman, 1996). There are also characteristics of the male partner that may be associated with risk for IPV initiation or persistence. Examples include partner's age, employment, and alcohol and drug use (Jasinski, 2001a; Aldarondo & Sugarman, 1996; Field & Caetano, 2003; Johnson, 2003; Wofford Mihalic et al., 1994). Furthermore, aspects of the relationship between intimate partners including marital status and relationship duration are associated with IPV initiation and persistence (Jasinski, 2001a; Jasinski, 2001b; Johnson, 2003; Connelly et al., 2006). For example, Jasinski found that unmarried cohabitating couples were more likely to have initiated violence than married couples over a 5-year period (Jasinski, 2001a).

There are also risk factors for IPV initiation and persistence that are related to violence itself (e.g. type, frequency of violence). For example, some researchers suggest that psychological

violence is a precursor to the initiation of physical violence (O'Leary, 1999; Quigley & Leonard, 2000). Also, the frequency of physical violence may be a risk factor for IPV persistence; at least one study has shown that the number of incidents of physical violence is positively associated with IPV persistence rates (Johnson, 2003).

The hypothesized risk factors (risk characteristics of individuals, partners, and relationships as well as psychological aggression and physical violence frequency) for IPV initiation and persistence may also differ based on race/ethnicity of women. However, to the authors' knowledge there has not been any study investigating rates of and risk characteristics for IPV initiation and persistence amongst a sample of predominantly AAPI women. In general, AAPI women have been underrepresented in IPV research; Yick and Oomen-Early found that less than 3% of the articles published by leading IPV journals focused on AAPI women (Yick & Oomen-Early, 2008). One of the reasons it is important to understand risk factors for IPV initiation and persistence in AAPI women is that rates of IPV are high in this population. Using results from several community-based studies, the Asian & Pacific Islander Institute on Domestic Violence estimated that 41-60% of study participants reported having experienced physical and/or sexual violence during their lifetime (Asian & Pacific Islander Institute on Domestic Violence, 2005).

Therefore, the objectives of this paper were to, amongst a sample of high psychosocial risk AAPI women: 1) determine 3-year rates of IPV initiation and persistence, and 2) identify risk factors for IPV initiation and persistence.

Methods

The data for this study originates from a randomized controlled trial of Hawaii's Healthy Start program (HSP) (Duggan et al., 2000). HSP is an early childhood home visiting family support program to improve family functioning, promote positive parenting, and promote child health and development in families at risk of child maltreatment. The original study and current analyses were approved by the Johns Hopkins University Institutional Review Board. The original study also was approved by the Hawaii Department of Health and the institutional review boards of the six hospitals where screening and assessment took place. Written consent was obtained from all study participants.

Original study sample

Women giving birth in six communities on Oahu from November 1994 to December 1995 underwent a two-stage screening and assessment protocol for risk factors associated with the potential for child maltreatment. This protocol has been described in detail elsewhere (Duggan et al., 2000; Duggan et al., 2004). The first stage involved medical record review for 15 possible risk factors such as being unmarried, having unstable housing, inadequate prenatal care, and history of substance abuse. The second stage involved a face-to-face assessment interview using the Family Stress Checklist (FSC) Interview (Kempe, 1976). Families deemed to be at risk for child maltreatment based on the FSC were eligible for the original evaluation study.

About 27% of all births were to families who were considered to be at risk of child maltreatment. Of these 1803 families identified as at risk, 137 were not eligible for the evaluation due to a lack of English language proficiency, 146 were not eligible due to the family being already enrolled in HSP or actively involved with Child Protective Services, and 623 were not eligible because they were identified on a day when the HSP program serving their community was closed to new referrals. Therefore, 897 were eligible for the evaluation. Of these, 730 agreed to enroll in HSP and the evaluation. Women randomly assigned to the HSP intervention group received home visiting services provided by a

paraprofessional home visitor for up to 3 years which aimed to promote positive parenting, promote child health and development, and reduce risk factors for child maltreatment. Women randomly assigned to the control group were referred to other parenting and family-support services as was usually done for eligible families when HSP enrollment was full. Details of the evaluation are provided elsewhere (Duggan et al., 2000; Duggan et al., 2004).

Evaluation staff administered a structured baseline maternal interview in the hospital obstetrical unit or at home within a month of delivery. Follow-up data were collected annually via structured maternal interviews for three years near the time of the index child's birthday.

Current study sample

For the current study, we included all women who participated in the evaluation (women in either the intervention or control group). While recognizing that all women may be at risk of IPV in a given relationship, for this study of IPV initiation and persistence, we intentionally limited the sample to women who remained in a relationship with one partner for three years. Therefore, women were included in the current study sample if they had completed both the baseline and third year interviews and had an intact relationship with the same partner at both time points. The relationship was considered intact if the partners were married, living together, or going together per maternal interview.

Of the 684 women who completed the baseline interview, 584 (85%) also completed the third year interview. Of these 584 women, 70 reported that they had no partner and 131 reported that they had a different partner than at the baseline interview. For 5 women it was not possible to determine whether the partner at the baseline and third year interviews was the same person. Therefore, the final sample for the current study included 378 women who had completed both the baseline and third year interviews and were known to have had an intact relationship.

Compared to women included in the current study, women who were excluded were more likely to be under 19 years old, to be unmarried, and to have known their partner for less than 2 years at baseline (all $p < .05$). However, these two groups had a similar IPV prevalence rate at baseline.

Measures

IPV Initiation and Persistence—IPV initiation and persistence were determined based on women's reports of physical violence. The physical assault subscale of the Conflict Tactics Scale (CTS) was used to measure physical violence (Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The CTS Version R (CTS-R) was used at baseline and the CTS-2 was used at all follow-up interviews. The CTS asks respondents to report how often in the past year their partner committed various acts of physical violence toward them. Response choices included: never, once, twice, 3-5 times, 6-10 times, 11-20 times, or >20 times. Both versions contain similar physical assault subscales (CTS-R: 8 items and CTS-2: 12 items). Reliability for this subscale ranges from .72-.88 for baseline and follow-up interviews.

Women who did not report physical violence at baseline were considered to experience IPV initiation if they reported 1 or more incidents of physical violence at a follow-up interview. Women who reported 1 or more incidents of physical violence at baseline were considered to experience IPV persistence if they also reported 1 or more incidents of physical violence at a follow-up interview.

Types of Violence—To assess whether the frequency of psychological aggression at baseline was associated with IPV initiation and persistence, we used the CTS-R psychological aggression subscale. To create a total number of incidents in the past year, we summed the mid-points of the response categories of each of the 6 subscale items. The resulting scores ranged from 0 to 150 and were highly skewed, with skewness of 1.66 (SE=.13) and kurtosis of 2.71 (SE=.25). A dichotomous variable using the median of 15 incidents as the cutpoint was created to indicate the presence of psychological aggression (45%) and the absence of psychological aggression (55%).

To assess whether the frequency of physical violence at baseline was a risk factor for IPV persistence, we used the 8 items on the CTS-R physical assault subscale. Using the same methods as above, a sum variable was created. Scores ranged from 1 to 115 and were highly skewed, with skewness of 3.35 (SE=.17) and kurtosis of 13.73 (SE=.33). A dichotomous variable using the median of 4 incidents was created to indicate the presence of frequent physical violence (64%) and the absence of frequent physical violence (36%).

Baseline Risk Characteristics—At baseline, women were asked their age, education status, and whether they had worked in the past year. Women were also asked what race or races they considered themselves to be; categorical options included Asian or Pacific Islander, White, Black or Eskimo. They were then asked to identify all of the ethnic origins they considered themselves. Women who chose one or more race or ethnic group were given the option of identifying a primary ethnicity. For this study, women were categorized into three groups: Asian; Native Hawaiian or Pacific Islander; and Other (White, other primary race or ethnicity, or no primary race or ethnicity). General mental health was measured by the 5-item version of the Mental Health Index (MHI-5), which gives an overall measure of anxiety and depressive symptoms (McHorney & Ware, 1995). The standard cutoff of <67 was used to define poor mental health. Substance use was defined as use of illicit drugs in the past year or use of alcohol in the past year together with a history of alcohol problems, as measured by ≥ 2 positive responses to the CAGE questions (Mayfield, McLeod, & Hall, 1974). The CAGE includes four questions assessing whether not the respondent ever tried to Cut down on drinking, felt Annoyed by criticism of their drinking, felt Guilty about drinking, or had an Eye-opener, or drink of alcohol, first thing in the morning. Women also reported their partner's age, employment status, and substance use as well as relationship attributes including marital status and relationship duration.

Statistical Analysis

For all analyses, the study sample was divided into two groups to assess risk for IPV initiation and persistence separately. The first group included women who did not experience physical violence at baseline (n=160) and the second group contained women who did experience baseline physical violence (n=218). Bivariate analyses assessed the association of each hypothesized risk factor (individual, partner, and relationship characteristics, and experience of psychological aggression) with IPV initiation (first group) and persistence (second group). Next, separate multivariate logistic regression analyses were completed to explore the independent influence of risk factors on IPV initiation and persistence.

All variables entered into the multivariate models either had a statistically significant association with IPV initiation or persistence at the bivariate level or were previously identified in the literature as factors associated with IPV initiation or persistence. Intervention group status was also added to all models as a control variable and group interactions were tested for all variables that were significantly associated with IPV

initiation or persistence. Stratified models were completed for all variables where there was an interaction by intervention group status. All analyses were conducted using SPSS 17.

Results

In the first group of women (those who did not experience physical violence at baseline), 39% had poor mental health, 25% had partners who were not working and 30% had partners who were using substances (Table 1). In the second group of women, (those who had experienced physical violence at baseline), 54% had poor mental health, 39% had partners who were not working and nearly half had partners who were using substances. In both groups, approximately two-thirds of women identified their primary ethnicity as Asian, Pacific Islander or Native Hawaiian, half had not worked in the past year, and 70% were not married to their partner.

IPV Initiation

Of the 160 women who reported no physical violence at baseline, 45% experienced IPV initiation by three years. At the bivariate level, women who did not work had more than two times the odds of experiencing IPV initiation compared to women who worked (OR=2.4, $p<.05$) and women who reported poor mental health had more than two times the odds of experiencing IPV initiation (OR=2.4, $p<.01$) (Table 2). Additionally, women who experienced frequent psychological aggression at baseline had more than 2 times the odds of experiencing IPV initiation (OR=2.3, $p<.05$).

In the multivariate model, being unemployed (AOR=3.1, $p<.01$) and reporting poor mental health (AOR=3.1, $p<.01$) at baseline were both strongly associated with experiencing IPV initiation. There was a statistically significant group interaction effect for employment ($p<.05$) but not for mental health. When the analyses were stratified by intervention and control group status, being unemployed was a risk factor for IPV initiation in both groups. However, the effect of not working on IPV initiation was less pronounced for women receiving home visiting services (intervention group AOR=2.4, $p<.10$; control group AOR=5.4, $p<.05$; results not shown).

IPV Persistence

Of the 218 women who reported physical violence at baseline, 43% reported IPV persistence. At the bivariate level, Pacific Islander or Native Hawaiian women (OR=2.4, $p<.05$) and those women who identified with another ethnicity or had no primary ethnicity (OR=2.7, $p<.05$) had greater odds of IPV persistence than Asian women (Table 3). Partner substance use was associated with increased risk of IPV persistence (OR=1.8, $p=.05$). Additionally, experiencing frequent psychological aggression (OR=1.7, $p=.05$) and experiencing more frequent physical violence at baseline (OR=2.6, $p<.01$) were both associated with IPV persistence.

In the multivariate model, women who were white, identified with another ethnicity or had no primary ethnicity (AOR=2.4, $p<.05$) had greater odds of experiencing IPV persistence compared to Asian women. In this model, experiencing frequent physical violence at baseline was also associated with increased risk of IPV persistence (AOR=2.1, $p<.05$). There was a statistically significant group interaction effect for ethnicity ($p<.05$) but not for experiencing frequent physical violence at baseline. When the analyses were stratified by intervention and control group status, ethnicity was no longer a statistically significant risk characteristic for IPV persistence (results not shown).

Discussion

The results of this study add to the growing literature on risk factors for IPV initiation and persistence among a sample of women at high psychosocial risk. First, we found that women who were unemployed at baseline have an increased risk of IPV initiation. Second, women who reported poor mental health were also at increased risk of IPV initiation. And third, women who reported 4 or more incidents of physical violence were at an increased risk of experiencing IPV persistence over 3 years. Building on the work of several others, our study finds that certain baseline risk characteristics and types of violence are associated with 3-year IPV persistence and initiation rates among a sample of AAPI women screened to be at risk of child maltreatment.

The rate of IPV initiation for women in this study (45%) was considerably higher than reported in other studies (Aldarondo, 1996; Jasinski, 2001a; Mouton et al., 2004; Coker et al., 2007). Comparing this study to other studies is difficult because of varying timeframes and different sampling methods. For instance, Jasinski's study from the NSFH examined IPV at baseline and then 5 years later (Jasinski, 2001a). None of the study samples included an AAPI population, and all of the samples were made up of participants older than our study sample. For example, Mouton et al examined IPV initiation among postmenopausal women (age 50-79) (Mouton et al., 2004). None of the studies included a similar population in terms of psychosocial risk. Although Coker et al included a low socioeconomic community-based sample, women in their study were predominantly over 40 (Coker et al., 2007).

Our study found that women experiencing physical violence at baseline had a cessation rate of 57%. This cessation rate falls well within the range of cessation rates reported in previous studies (Jasinski, 2001a; Wofford Mihalic et al., 1994; Aldarondo, 1996; Quigley & Leonard, 1996; O'Leary et al., 1989; Field & Caetano, 2005). As with IPV initiation, none of the previous studies included a sample of women that were similar to the women in our study, particularly with respect to ethnicity, age, and psychosocial risk. One exception is the work by Connelly et al which reports on IPV persistence among a sample of women from the National Survey of Child and Adolescent Well-Being (NSCAW) Child Protective Services sample (Connelly et al., 2006). By definition, all women in their study have been involved with child welfare services and are at risk of child maltreatment or have substantiated cases of child maltreatment. This sample of women (although older, mean age of 31) is also similar to our sample in terms of marital status, education, mental health and substance use. In this sample, Connelly et al found that women who experienced IPV at baseline reported an 18-month cessation rate of 60%. This is very similar to the reported cessation rate in our study of 57%, suggesting that among women with many psychosocial risk factors, a substantial portion of violence persists over time. Given that there are often children involved in romantic relationships, the high rate of IPV persistence is of particular concern; children who are repeatedly exposed to IPV are at increased risk of many health and behavior problems (Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003; Kitzmann, Gaylord, Holt, & Kenny, 2003).

We found an important relationship between a woman's employment status and risk of IPV initiation; for women who worked at baseline, there was significantly lower risk for IPV initiation. This finding is somewhat inconsistent with the work of others (Staggs, Long, Mason, Krishnan, & Riger, 2007; Byrne, Resnick, Kilpatrick, Best, & Saunders, 1999); these studies find that employment status and employment stability do not predict future experiences of IPV. However, there is growing evidence that the relationship between IPV and employment is bidirectional and longitudinal studies are necessary to further decipher this relationship (Tolman & Raphael, 2000; Riger & Staggs, 2004). It is also possible that

women living in Hawaii face increased stress when unemployed due to the exceptionally high cost of living. Family stressors have been shown to be associated with IPV in several studies (Frye & Karney, 2006; Cano & Vivian, 2003). Additionally, some suggest that structural factors such as unemployment rates, economic recession, labor market demands, as well as neighborhood disadvantage, cultural beliefs about violence and women's labor force participation should be considered when examining the IPV and employment relationship (Riger & Staggs, 2004).

The applications of these findings are limited given the high psychosocial risks of this sample. However, employment-related services may be an area in which to target IPV prevention efforts for women experiencing multiple psychosocial risks. For example, building job skills training programs and assisting in job-seeking services might be one way to prevent against IPV. Given the United States' unprecedented unemployment level, healthcare and other service providers should be especially attentive to employment in families at high psychosocial risk. Home visiting may also be an effective intervention for reducing intimate partner violence for families at the greatest psychosocial risk; in our study, being unemployed was less of a risk factor for IPV initiation for women if they received home visiting services. Previous work in this sample suggests that home visiting may reduce IPV victimization for women with high psychosocial risk receiving home visiting services during the intervention period (Bair-Merritt et al., 2010).

Among women who were not in a physically violent relationship at baseline, those reporting poor mental health had greater odds of experiencing IPV initiation, controlling for other risk characteristics. This finding has important implications for both mental health and intimate partner violence screening. Several researchers have found that psychological aggression independently adversely affects health and mental health (Coker et al., 2002; O'Leary, 1999; Dutton, Kaltman, Goodman, Weinfurt, & Vankos, 2005; Dutton et al., 2006; Bonomi et al., 2006). Thus, early identification of women experiencing psychological aggression can reduce not only the effects of this, but additional harm resulting from emerging physical violence. This is particularly important given that women with multiple psychosocial risks often include high rates of mental health problems.

As expected, the frequency of physical violence at baseline was predictive of IPV persistence. Women who experienced 4 or more incidents of physical violence at baseline had more than two times the odds of experiencing IPV persistence compared to women experiencing 1-3 incidents. This is comparable to other previous studies which found the highest rates of persistence to be among women experiencing the most violence (Johnson, 2003; Dutton et al., 2005; Feld & Straus, 1990). Recognizing that women experiencing frequent physical violence are experiencing the most IPV persistence is important for many reasons. Severe violence has been associated with greater injury and physical health problems (McCauley, Kern, Kolodner, Derogatis, & Bass, 1998; Forjuoh, Coben, & Gondolf, 1998). It has also been associated with worse mental health outcomes including higher rates of PTSD and depression (Dutton et al., 2005; Jones, Hughes, & Unterstaller, 2001).

Lastly, our study has meaningful findings with regards to ethnicity. Women who identified their primary ethnicity as Asian had lower odds of experiencing IPV persistence compared to all other women. Previous research suggests that rates of IPV persistence vary by race and ethnicity (Connelly et al., 2006; Field & Caetano, 2003; Jasinski, 2001a), but these studies have not included AAPI women. The AAPI population is very culturally diverse. Although limited by sample size, the two most populous AAPI groups in this sample are Hawaiian (categorized as Pacific Islander or Native Hawaiian) and Filipino (categorized as Asian). In other research, these two groups have had higher rates of IPV compared to white women

and other Asian women (Blaisdell-Brennan & Goebert, 2001; Magnussen et al., 2004). With regards to the violence patterns in this study, the rates of IPV persistence are slightly different for the two groups; Hawaiian women had a persistence rate of 49% and Filipino women had a persistence rate of 28% ($p=.05$, results not shown). However, rates of initiation were very similar (44% and 41% for Hawaiian and Filipino women respectively). It is important to consider that there are wide ethnic and cultural variations among AAPI and future research should consider subgroup analysis that emphasizes the heterogeneity that exists within the AAPI population (Yick & Oomen-Early, 2008). It is very possible that such aspects of culture which may influence the likelihood of IPV persistence were not measured by this study. Some have called for research on contextual influences such as acculturation, racism, value systems, oppression, the role of women, and marginalization (Yick & Oomen-Early, 2008; Kasturirangan, Krishnan, & Riger, 2004).

This study has several strengths, including its long follow-up period and unique sample population. Additionally, we intentionally limited this study to women who remained in a relationship with their partner for at least three years which may bias our results. Women who were excluded because they did not remain in a relationship were slightly younger and more likely to be unmarried at baseline. While this limits the study's generalizability, it provides a comprehensive look at violence patterns within intact relationships. However, some women may have experienced IPV cessation, but exited their relationship before three years. Research by Wuest and Merritt-Grey suggests that remaining in a relationship with a formerly violent partner is challenging and may entail living differently-particularly requiring a woman to gain a sense of personal capacity and autonomy and to shift the dynamics of control in the relationship (Wuest & Merritt-Gray, 2008). Alternatively, some women may have left a persistently violent relationship before the third year but then later returned to the relationship. They may be at continued risk of IPV; some suggest that women who leave and then later return to a relationship are at the highest risk of experiencing continued IPV (Bell, Goodman, & Dutton, 2007). Unfortunately, this study was unable to address why a specific relationship ended and at what particular point it ended in relationship to experiencing IPV.

Another limitation relates to our measurement of IPV initiation. Due to the change in versions of the CTS instrument between baseline and follow-up interviews, we may have misclassified women as being in a non-violent relationship at baseline when in fact they may have been experiencing incidents of IPV that were not measured on the CTS-R (for example, "slammed against the wall"). Three new items were added and 5 items were modified in the new version to account for more types of incidents of IPV (Straus et al., 1996).

Additionally, our study focused on a high psychosocial risk sample; all families were assessed as at risk of child maltreatment. To be eligible for this study, the family had to score positive for multiple behavioral and socioeconomic risk factors. Thus, by definition, the study sample is not representative of families of newborns in Hawaii which limits the generalizability of the results. Based on eligibility criteria for HSP and the evaluation, women were excluded if they could not speak or understand English, if they were already involved with HSP or Child Protective Services, or if they were identified on day when enrollment in HSP was closed, which may further limit the study's generalizability. A final limitation is the study's small sample size.

In conclusion, our study indicates that amongst a high psychosocial risk sample of AAPI women there are different risk factors for IPV initiation and persistence. We find that women in non-violent relationships who are unemployed and report poor mental health have an increased risk of IPV initiation. Additionally, women who experience the most physical

violence at baseline are at increased risk of IPV persistence. Future prevention and screening efforts may need to focus on these risk factors, particularly for women who experience multiple psychosocial risks.

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Table 1
Baseline Characteristics of Study Sample

	Non-violent Relationship at Baseline (n=160)	Violent Relationship at Baseline (n=218)
Baseline Risk Characteristics	n (%)	n (%)
<i>Individual Characteristics</i>		
Age <19	29 (18)	46 (21)
Ethnicity		
Asian	44 (27)	65 (30)
Pacific Islander or Native Hawaiian	51 (32)	76 (35)
Other ¹	65 (41)	77 (35)
Less than high school education	47 (29)	76 (35)
Not employed in the past year	77 (48)	108 (50)
Poor mental health	62 (39)	118 (54)
Substance use	18 (11)	43 (20)
<i>Partner Characteristics</i>		
Age <19	12 (8)	20 (9)
Not employed	40 (25)	84 (39)
Substance use	48 (30)	106 (49)
<i>Relationship Characteristics</i>		
Not married	113 (71)	153 (70)
Relationship duration <2 years	37 (23)	40 (18)

¹ White, other primary race or ethnicity, or no primary race or ethnicity.

Table 2
Baseline Risk Characteristics Associated with Intimate Partner Violence (IPV) Initiation
in Intact Couples in a Non-violent Relationship at Baseline (n=160)

Baseline Risk Characteristics	SIMPLE MODEL ¹		FULL MODEL ²	
	OR	95% CI	AOR	95% CI
<i>Individual Characteristics</i>				
Age				
Age 19+	1.0	--	1.0	--
Age <19	0.8	0.4, 1.9	0.4	0.1, 1.4
Ethnicity				
Asian	1.0	--	1.0	--
Pacific Islander or Native Hawaiian	1.3	0.6, 2.9	1.6	0.6, 4.4
Other ³	1.2	0.6, 2.7	1.3	0.5, 3.3
Education				
High school graduate	1.0	--	1.0	--
Less than high school	1.4	0.7, 2.8	2.2	0.8, 5.9
Employment Status				
Employed in the past year	1.0	--	1.0	--
Not employed in the past year	2.4	1.3, 4.5	3.1	1.4, 6.9
Mental Health				
Good mental health	1.0	--	1.0	--
Poor mental health	2.4	1.2, 4.6	3.1	1.4, 6.8
Substance Use				
No substance use	1.0	--	1.0	--
Substance use	1.6	0.6, 4.3	1.0	0.3, 3.1
<i>Partner Characteristics</i>				
Age				
Age 19+	1.0	--	1.0	--
Age <19	0.6	0.2, 2.1	0.6	0.1, 3.5
Employment Status				
Employed	1.0	--	1.0	--
Not employed	1.2	0.6, 2.4	0.6	0.3, 1.5
Substance Use				
No substance use	1.0	--	1.0	--
Substance use	1.7	0.9, 3.4	1.8	0.7, 4.3
<i>Relationship Characteristics</i>				
Marital Status				
Married	1.0	--	1.0	--
Not married	1.5	0.7, 3.0	1.8	0.7, 4.5
Length of Relationship				
Relationship duration ≥ 2 years	1.0	--	1.0	--
Relationship duration <2 years	1.2	0.6, 2.5	1.4	0.6, 3.6

Baseline Risk Characteristics	SIMPLE MODEL ¹		FULL MODEL ²	
	OR	95% CI	AOR	95% CI
<i>Types of Violence</i>				
Frequency of Psychological Aggression				
Less than 15 incidents	1.0	--	1.0	--
15 or more incidents	2.3	1.1, 4.7	1.8	0.8, 4.2

¹ Bivariate regression models include each variable listed individually.

² Multivariate regression model includes all variables listed and intervention group status in one model. Intervention group (reference) AOR=1.0; Control group AOR=0.6 (95%CI 0.3, 1.4).

³ White, other primary race or ethnicity, or no primary race or ethnicity.

OR=Odds Ratio; AOR=Adjusted Odds Ratio; 95%CI= 95% Confidence Interval.

Table 3
Baseline Risk Characteristics Associated with Intimate Partner Violence (IPV)
Persistence in Intact Couples in a Violent Relationship at Baseline (n=218)

Baseline Risk Characteristics	SIMPLE MODEL ¹		FULL MODEL ²	
	OR	95%CI	AOR	95%CI
<i>Individual Characteristics</i>				
Age				
Age 19+	1.0	--	1.0	--
Age <19	1.0	0.5, 2.0	1.0	0.4, 2.6
Ethnicity				
Asian	1.0	--	1.0	--
Pacific Islander or Native Hawaiian	2.4	1.2, 4.8	1.9	0.8, 4.3
Other ³	2.7	1.3, 5.4	2.4	1.1, 5.4
Education				
High school graduate	1.0	--	1.0	--
Less than high school	1.6	0.9, 2.8	1.6	0.7, 3.3
Employment Status				
Employed in the past year	1.0	--	1.0	--
Not employed in the past year	1.6	0.9, 2.7	1.1	0.6, 2.1
Mental Health				
Good mental health	1.0	--	1.0	--
Poor mental health	1.1	0.7, 1.9	0.7	0.4, 1.4
Substance Use				
No substance use	1.0	--	1.0	--
Substance use	1.9	1.0, 3.7	1.4	0.6, 3.0
<i>Partner Characteristics</i>				
Age				
Age 19+	1.0	--	1.0	--
Age <19	1.1	0.4, 2.8	1.2	0.3, 4.4
Employment Status				
Employed	1.0	--	1.0	--
Not employed	1.4	0.8, 2.4	1.2	0.7, 2.3
Substance Use				
No substance use	1.0	--	1.0	--
Substance use	1.8	1.0, 3.1	1.3	0.7, 2.5
<i>Relationship Characteristics</i>				
Marital Status				
Married	1.0	--	1.0	--
Not married	1.2	0.7, 2.1	0.9	0.4, 1.8
Length of Relationship				
Relationship duration ≥2 years	1.0	--	1.0	--
Relationship duration <2 years	0.8	0.4, 1.6	0.8	0.3, 1.8

Baseline Risk Characteristics	SIMPLE MODEL ¹		FULL MODEL ²	
	OR	95%CI	AOR	95%CI
<i>Types of Violence</i>				
Frequency of Psychological Aggression				
Less than 15 incidents	1.0	--	1.0	--
15 or more incidents	1.7	1.0, 3.0	1.2	0.6, 2.4
Frequency of Physical Violence				
Less than 4 incidents	1.0	--	1.0	--
4 or more incidents	2.6	1.4, 4.7	2.1	1.0, 4.2

¹ Bivariate regression models include each variable listed individually.

² Multivariate regression model includes all variables listed and intervention group status in one model. Intervention group (reference) AOR=1.0; Control group AOR=1.4 (95%CI 0.7, 2.5).

³ White, other primary race or ethnicity, or no primary race or ethnicity.

OR=Odds Ratio; AOR=Adjusted Odds Ratio; 95%CI= 95% Confidence Interval.