

# Risk Factors for Violent Injuries and Their Severity Among Men in The Gambia

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## Abstract

A matched case-control study was conducted to identify risk factors for injury from physical violence and its severity in Gambian men. Study participants were recruited from eight emergency rooms and outpatient departments in two health administrative regions. Cases were male patients aged  $\geq 15$  years who had been violently injured. A control patient for each case, matched for the hospital or health center, date of injury, gender, and age, was selected from those injured due to nonviolence causes. In total, 447 case-control pairs were recruited. Results of the conditional logistic regression analysis showed that case patients who worked as businessmen (odds ratio [OR], 1.93; 95% confidence interval [CI] [1.16, 3.20]), had monthly household income of  $\geq$ US\$311 (OR, 2.12; 95% CI [1.06, 4.24]), had two or more male siblings (OR, 2.20; 95% CI [1.15, 4.21]), had consumed alcohol in the past week (OR, 3.32; 95% CI [1.25, 8.84]), and had been physically abused (OR, 5.10; 95% CI [2.71, 9.62]) or verbally abused (OR, 1.63; 95% CI [1.04, 2.56]) in the past 12 months were significantly associated with the occurrence of injury from physical violence. Severe injuries during the violence were significantly associated with events that took place in public spaces, with certain injury mechanisms (being stabbed/cut/pierced, struck by an object, assaulted by fist punching/leg kicking/head-butting, and scalded/stoned), having injuries to the upper extremities, and smoked cigarettes in the past week. Specific public health programs aimed at preventing physical violence and severe injuries against men should be developed in The Gambia based on modifications of the identified risk factors.

## Keywords

intentional injury, behavioral issues, risk factors, violence, male on male violence

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Each year, an estimated 1.3 million deaths occur as a result of violence (WHO, 2014). Deaths from physical violence are disproportionately distributed with more than 90% occurring in low- and middle-income countries, with the mortality rate 2.5 times higher than in high-income countries (WHO, 2014). In Africa, violence is responsible for 36% of all injury deaths, and its mortality rate of 37 per 100,000 population, which is higher than the global average of 25 per 100,000 population (WHO, 2010). Nonfatal injuries from physical violence are estimated to exceed fatal injuries by at least 20 times (Rutheford, Zwi, Grove, & Butchart, 2007; WHO, 2008), and impacts of these nonfatal injuries may lead to psychological trauma, extended rehabilitation, and prolonged recovery (Dutton & White, 2013; Skogstad et al., 2014; Wiseman, Foster, & Curtis, 2013).

Identifying risk factors for violence can help develop effective interventions to reduce violent injuries. According to the lifestyle-routine activity theory (Cohen,

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Cluegel, & Land, 1981), individuals' sociodemographic characteristics, behaviors, and daily routine activities can lead to either increased or decreased exposure to violence victimization. Males accounted for more than 70% of victims of physical violence with estimated rates more than two times those of female counterparts (Faergemann, Lauritsen, Brink, Skov, & Mortensen, 2009; Subba, Binu, Menezes, Kumar, & Rana, 2010; Tingne, Shrigiriwar, Ghormade, & Kumar, 2014). Gender disparity in violence victimization may be due to the inherent aggressive nature of males and their inclination toward violent behaviors and retaliatory attitudes (Copeland-Linder, Johnson, Haynie, Chung, & Cheng, 2012). Studies in Asia, Europe, and the United States demonstrated that male violence victimization is significantly associated with younger age (Carmo, Grams, & Magalhães, 2011), low household income (Faergemann et al., 2009), unemployment (Hines, Brown, & Dunning, 2007), lower educational levels (Brennan, Moore, & Shepherd, 2006), alcohol consumption and illicit drug use (Sabina, Schally, & Marciniak, 2017), being married (De Macedo Bernardino, Barbosa, Da Nóbrega, Cavalcante, De Castro Martins, & D'Avila, 2016), divorced or separated (MacDonald & Wells, 2001), and prior violence (Richardson, Vil, Sharpe, Wagner, & Cooper, 2016) or history of childhood abuse (Drijber, Reijnders, & Ceelen, 2013; Widom, Czaja, & Dutton, 2014). The investigation of risk factors for physical violence against men is very limited in Africa, and it would be difficult to extrapolate the results from studies conducted in Asia, Europe, and the United States into African men because of socioeconomic, behavioral, cultural, and environmental differences. For example, cultural and social norms in African society are highly supportive of the use of violence either as a normal method of discipline or as a usual part of upbringing, thus creating a conducive environment for violent victimization (Alesina, Brioschi, & Ferrara, 2016; Last, 2000).

Identifying factors associated with injury severity may help quantify medical resources required for treatment, assist in performing triage, facilitate quality improvement in trauma care, and predict prognosis of physical and psychosocial outcomes (Brennan et al., 2006; Cappa, Conger, & Conger, 2011). Measuring injury severity may also help in identifying weapons causing more severe harm which may be used to inform policy decisions on its restriction. Few studies have investigated risk factors associated with the severity of injuries from physical violence, particularly in African countries. To address the abovementioned issues, a matched case-control study was conducted to investigate risk factors for injuries from physical violence and those for their severity among men in The Gambia.

## Methods

### Study Settings and Participants

The Gambia is one of the smallest countries in Africa with a population of approximately 2 million people and a population density of 176 persons per km<sup>2</sup> and it is divided into seven health administrative regions (GBoS & UNFPA, 2013). During an 8-month study period from October 2016 to May 2017, study participants were recruited from emergency rooms (ERs) and outpatient departments (OPDs) of eight public health-care facilities located in the Western Health Regions I and II. The two regions are located within the urbanized Greater Banjul Area (GBA) and account for 60% of the country's population (GBoS & UNFPA, 2013). The eight health facilities, included one hospital (Serrekunda General Hospital), two major health centers (Brikama and Faji Kunda), and five minor health centers (Gunjur, Sukuta, Bakau, Banjul'nding, and Serrekunda) were selected among 13 health-care facilities to be representative of the country in terms of geographical areas (i.e., peri-urban and urban) and health-care facility type (i.e. hospitals, major, and minor health centers). These public health facilities receive a diverse clientele with a broad range of patients with all injury types. Private health-care facilities were not included in the study because they do not offer 24-hr ER/OPD services to all patients.

Cases were male patients aged  $\geq 15$  years who sought medical treatment for injuries from physical violence at an ER or OPD of the eight health-care facilities. An injury from physical violence was defined as any injury or physical pain that had been intentionally inflicted by another person (Hirschinger et al., 2003). Injuries as a result of physical violence were ascertained based on self-disclosure by the patient or family members, friends, colleagues, or police officers escorting the patient. Patients who were reluctant to disclose the true cause of injury but had stabbed/pierced or gunshot wounds, human bites, and tufts of hair pulled out, swollen body parts, or complained of internal body pain were further queried. Those injured patients who remained highly suspicious of violence but did not provide a clear description of injury mechanism were not included in the study. After injury conditions of an eligible patient had stabilized, he was approached and invited to participate in the study. For patients who made more than one injury incident visit during the study period, only the first visit was considered. Of 474 eligible patients with a violent injury, 447 agreed to participate in the study.

A control patient for each case, matched by hospital or health center, date of injury, gender, and age ( $\pm 5$  years), was selected from those aged  $\geq 15$  years who were injured from traffic crashes, falls, sports, or other nonviolent causes. This matching was presumed to exclude potential

confounding effects of geographical area and calendar times (weekdays, weekends, and holidays). In total, 447 case-control pairs agreed to participate in the study.

Patients were excluded if they had impaired cognitive orientation (unable to verbally communicate with data collectors) or they could not provide written consent. Ethical approval (R016-006) was obtained from the University of The Gambia Research and Publication Committee and The Gambia Government/Medical Research Council Joint Ethics Committee on human subjects' research, and all participants provided written informed consent.

### Data Collection

When an eligible case or control patient agreed to participate in the study, personal interviews with a structured questionnaire were conducted in a private room. The interviews required approximately 25 min to complete. A patient's primary language was used if he could not understand English. Information on sociodemographics (e.g., age, height, weight, ethnicity, marital status, educational level, employment status, and household income level); injury characteristics (e.g., date and time, place, mechanism, nature, body parts and severity of the injury and physical violence perpetrator); lifestyle behaviors in the past week (i.e., frequency of cigarette smoking, alcohol consumption, and illicit drug use); experience of verbal abuse, physical threats, and physical abuse in the past 12 months; social support; and risk-taking behaviors was collected.

Data collectors who were recruited from ER physicians and OPD nurses in each of the eight health facilities received 1 day of training on the use of the questionnaire. To ascertain the accuracy and consistency in recording responses, the structured questionnaire was tested on a pilot sample of 48 male patients from the eight participating facilities; after the pilot testing, these data collectors converged and discussed the questionnaire to ensure their understanding and adequate interpretation in the local languages. To ensure data quality, each study site was visited by a researcher (PB) at bi-weekly intervals during the 8-month study period to check for completeness and ensure adherence to the study protocol.

### Measures

Injury severity was measured by the Abbreviated Injury Scale (AIS) and Injury Severity Scale (ISS). The AIS, based on an anatomic classification system, is an ordinal scale of injury severity ranging from 1 (minor injury) to 6 (unsurvivable) for each of six body regions (the head/neck, face, chest, abdomen, extremities/pelvis, and external skin; Salottolo et al., 2009). The ISS, which assesses the combined effects of multiple injuries scores, is

calculated as the sum of the squares of the highest AIS code in each of the three most severely injured body regions. ISS scores were further categorized into four levels: minor/moderate (scores of 1–8), serious (scores of 9–15), severe (scores of 16–24), and critical (scores of  $\geq 25$ ; Stevenson, Segui-Gomez, Lescohier, Di Scala, & McDonald-Smith, 2001). A severe injury from physical violence was defined as an ISS score of  $\geq 9$ .

Given the sensitivity to information on illicit drug use and past violence experience, these variables were obtained by asking questions in the following manner: "Do you use any drugs other than medications?" "In the past 12 months, has anyone ridiculed, insulted, shouted, or yelled at you?" "In the past 12 months, have you experienced any physically threatening gestures or been threatened with a stick or other tools?" and "In the past 12 months, have you been physically hurt by being pushed, pulled, slapped, scolded, punched, kicked, or hit with an object?"

The 12-item Multidimensional Scale of Perceived Social Support (MSPSS) was used to assess social support. The MSPSS measures the level of support that an individual perceives in three domains of family, friends, and a significant other (Zimet, Dahlem, Zimet, & Farley, 1988). This scale performed excellent psychometric properties for African American population (e.g., Cronbach's  $\alpha$  coefficients of 0.91–0.94 for the three domains; Canty-Mitchell & Zimet, 2000); it also displayed as a valid scale across African populations of Uganda and Malawi (Nakigudde, Musisi, Ehnvall, Airaksinen, & Agren, 2009; Stewart, Umar, Tomenson, & Creed, 2014). In the pilot sample, the Cronbach's  $\alpha$  coefficients for the three domains were 0.87–0.93.

Risk-taking behaviors were assessed by the revised Domain-Specific Risk-Taking Scale (DOSPERT). This 30-item DOSPERT evaluates the likelihood that respondents might engage in behaviors from six risk domains (i.e., Ethical, Gambling, Investing, Health/Safety, Recreational, and Social) using a 7-point rating scale (Blais & Weber, 2006). A high score indicates a greater risk-taking level for each of the six domains. The DOSPERT has been validated in a wide range of settings, populations, and cultures, including South Africa (Szrek, Chao, Ramlagan, & Peltzer, 2012) which has similar demographic characteristics to The Gambia. Three domains of Health/Safety, Recreational, and Social were used in this study. In the pilot sample, the Cronbach's  $\alpha$  coefficients for the three domains were 0.78–0.92.

### Statistical Analysis

Distributions of sociodemographic, behavioral, and social characteristics between case and control patients were compared using Pearson's  $\chi^2$  test for categorical

variables and Student's *t* test for the continuous variables. Furthermore, case patients with ISS scores of  $\geq 9$  (severe injuries) and those with ISS scores of  $< 9$  (non-severe injuries) were compared using Pearson's  $\chi^2$  test.

A conditional logistic regression model was used to identify independent relationships of potential risk or protective factors with the occurrences of injury from physical violence and severe injuries resulting from physical violence in which adjusted odds ratios (ORs) and their 95% confidence intervals (CIs) were computed. To avoid large type II errors in variable selection and biased inferences, variables with a *p* value of  $< 0.25$  in the bivariable logistic analysis were included in the multivariable analysis (Maldonado & Greenland, 1993). During the multivariable analysis, matching variables of health facility and age were forced into the model, and *p* values of  $< 0.05$  were considered statistically significant. The Hosmer–Lemeshow goodness of fit and likelihood ratio tests were used to evaluate the appropriateness of each model (Hosmer & Lemeshow, 1980). All analyses were performed using the Statistical Analysis Software (SAS) package (v. 9.4 for Windows; SAS Institute, Cary, NC).

## Results

Of 474 male patients with injuries from physical violence at the eight ER/OPD units identified over the 8-month study period, 447 (94.3%) agreed to participate in the study and were successfully matched to their own controls at the same health facility, same date of violence, and similar age. There was no significant difference in all the sociodemographics between patients (447 patients) who agreed to participate and those 27 patients (5.7%) who declined.

Distributions of injury patterns among the 447 case patients with injuries from physical violence are presented in Table 1. Injuries from physical violence mostly occurred in the afternoon, 137 (30.9%); in the morning, 125 (28.1%); in the street, 151 (34.6%); and at home, 112 (25.6%). The most common mechanism of injuries was being struck by an object 142 (31.8%), followed by fist punching/leg kicking/head-butting, 117 (26.2%), and stabbing/cutting/piercing, 89 (19.9%). While 400 (90.5%) of injuries were abrasions/contusions/lacerations only, injuries to body parts more frequently occurred to the face, 115 (26.9%); upper extremities, 106 (24.8%); and the head/neck 90 (21.0%); and 161 (36%) of injuries had ISS scores of  $\geq 9$ . Most of the perpetrators were strangers, 164 (36.7%), or friends, 150 (33.6%).

Comparisons of sociodemographics between case and control patients are presented in Table 2. Compared to control patients, case patients with injuries from physical violence were significantly more likely to have been

Fula, non-Gambians, married for  $\geq 5$  years, and a businessman, and have a higher household income and two or more male siblings. No significant differences in age, marital status, educational level, childhood upbringing, or number of female siblings between case and control patients were detected.

Comparisons of behavioral and social characteristics between case and control patients are presented in Table 3. Compared to control patients, case patients who sustained an injury from physical violence were significantly more likely to have had the experience of being verbally or physically abused in the past 12 months, and they were also significantly more likely to have smoked cigarettes, consumed alcohol, and used illicit drugs in the past week. No significant differences in social support or risk-taking behaviors between case and control patients were detected.

Results of conditional logistic regression analyses of risk factors for injuries from physical violence are presented in Table 4. After adjusting for confounders, compared to patients employed in the civil service, those who had a business job (OR, 1.93; 95% CI [1.16, 3.20]) were more likely to have an injury from physical violence. Patients who had a monthly household income of  $\geq$ US\$311 (OR, 2.12; 95% CI [1.06, 4.24]) and two or more male siblings (OR, 2.20; 95% CI [1.15, 4.21]) were more likely to have experienced an injury from physical violence than their counterparts. Patients who had consumed alcohol in the past week (OR, 3.32; 95% CI [1.25, 8.84]) and had been physically abused (OR, 5.1; 95% CI [2.71, 9.62]) or verbally abused (OR, 1.63; 95% CI [1.04, 2.56]) were more likely to have an injury from physical violence than their counterparts.

Comparisons of injury characteristics between case patients with severe and non-severe injuries from physical violence are presented in Table 5. Compared to patients who sustained non-severe injuries, those with severe injuries were significantly more likely to have experienced them in a public space, to have been stabbed/cut/pierced or struck by an object, to have an injury to the upper extremity, and to have smoked cigarettes and used illicit drugs in the past week. No significant differences were detected in age, time of injury, weapons, nature of injury, and alcohol consumption between men with severe and those with non-severe injuries from physical violence.

Results of conditional logistic regression analyses of risk factors for severe injuries from physical violence are presented in Table 6. Compared to patients who had experienced an event of physical violence on the street, those who had experienced an event in a public space (OR, 2.59; 95% CI [1.12, 5.95]) were more likely to have a severe injury. Compared to patients who fell after being pushed, those who were stabbed/cut/pierced (OR, 8.72; 95% CI [3.29, 23.1]), struck by an object (OR, 4.00; 95%

**Table 1.** Injury Characteristics of 447 Male Patients With an Injury From Physical Violence.

Characteristic		<i>n</i>	(%)
Time of injury	06:00–11:59	125	(28.1)
	12:00–16:59	137	(30.9)
	17:00–20:59	88	(19.8)
	21:00–05:59	94	(21.2)
Place of injury	Street	151	(34.6)
	Home	112	(25.6)
	Public space	58	(13.3)
	Worksite	51	(11.7)
	Bar or restaurant	37	(8.4)
	Sports area or educational facility	28	(6.4)
Mechanism of injury	Fall by pushing	74	(16.6)
	Stab/cut/pierced	89	(19.9)
	Struck by an object	142	(31.8)
	Fist punching/leg kicking/head-butting	117	(26.2)
	Burn/stoning	25	(5.5)
Weapon used	Blunt object	31	(7.8)
	Bottle/glass	27	(6.8)
	Sharp object	81	(20.3)
	Fist punch/leg kick/head butt	221	(55.4)
	Hot object or liquid/stone	39	(9.7)
Body part injured	Lower extremity	38	(8.9)
	Upper extremity	106	(24.8)
	Thorax/abdomen/pelvis	24	(5.6)
	Head/neck	90	(21.0)
	Face	115	(26.9)
	General body pain	55	(12.8)
Nature of injury	Abrasion/contusion/laceration	400	(90.5)
	Dislocation/sprain/strain	17	(3.2)
	Internal body pain	25	(6.3)
Injury Severity Score (ISS)	Minor/moderate (<9)	286	(64.0)
	Serious (9–15)	92	(20.6)
	Severe (16–24)	59	(13.2)
	Critical (≥25)	10	(2.2)
Perpetrator of the physical violence	Stranger	164	(36.7)
	Family member	64	(14.7)
	Friend	150	(33.6)
	Co-worker or classmate	67	(15.0)

CI [1.72, 9.27]), assaulted by fist punching/leg kicking/head-butting (OR, 2.91; 95% CI [1.24, 6.86]), or scalded/stoned (OR, 5.65; 95% CI [1.10, 29.1]) were more likely to have severe injuries. Patients who sustained upper extremity injuries (OR, 3.24; 95% CI [1.08, 9.73]) and had smoked cigarettes in the past week (OR, 3.52; 95% CI [1.93, 6.43]) were more likely to have a severe injury than their counterparts.

## Discussion

To the knowledge of the authors, this was the first study in sub-Saharan Africa to investigate risk factors for

physical violence victimization in men presenting to ER/OPD for injury treatment. The results revealed that having a business job, a higher household income, more male siblings, alcohol consumption in the past week, and the experience of verbal or physical abuse in the past 12 months were associated with an increased risk of an injury from physical violence. Once an injury from physical violence occurred, those injuries that occurred in a public space, with certain injury mechanisms (being stabbed/cut/pierced, struck by an object, assaulted by fist punching/leg kicking/head-butting, and scalded/stoned, to the upper extremities), and for cigarette smokers were associated with the presence of more severe injuries.

**Table 2.** Comparisons of Sociodemographics Between the 447 Cases and 447 Control Patients.

Characteristic	Cases (n = 447)		Controls (n = 447)		p value
	n	(%)	n	(%)	
Age (years)					
15–24	184	(43.4)	185	(42.5)	.863
25–34	155	(36.6)	170	(39.1)	
35–44	68	(16.0)	63	(14.5)	
≥45	17	(4.0)	17	(3.9)	
Ethnicity					
Mandinka	151	(33.9)	148	(33.1)	.036
Wolof	79	(17.7)	98	(21.9)	
Fula	115	(25.8)	83	(18.6)	
Other <sup>a</sup>	101	(22.6)	118	(26.4)	
Nationality					
Gambian	407	(91.1)	426	(95.3)	.012
Non-Gambian	40	(8.9)	21	(4.7)	
Marital status					
Single	318	(71.2)	304	(68.5)	.685
Married	128	(28.6)	139	(31.3)	
Widow/separated/divorced	1	(0.2)	1	(0.2)	
Marital duration (≥5 years)	95	(77.9)	85	(64.8)	.013
Educational level					
No formal education	76	(17.1)	92	(20.8)	.363
Primary and secondary education	238	(53.6)	231	(52.1)	
Tertiary (college/university)	130	(29.3)	120	(27.1)	
Employment status					
Civil servant	68	(16.0)	105	(24.0)	.003
Unemployed	59	(13.9)	65	(14.8)	
Business	171	(40.1)	125	(28.5)	
Student	125	(29.3)	141	(32.2)	
Other <sup>b</sup>	3	(0.7)	2	(0.5)	
Monthly household income <sup>c</sup> (≥GMD14,000)	38	(10.5)	22	(6.4)	.049
Number of male siblings (≥2)	410	(91.7)	377	(84.3)	.001
Number of female siblings (≥2)	385	(86.1)	382	(85.5)	.774
Childhood, brought up by					
Both parents	370	(84.1)	383	(86.1)	.285
Single parent	19	(4.3)	11	(2.5)	
Grandparents	27	(6.1)	33	(7.4)	
Other <sup>d</sup>	24	(5.5)	18	(4.0)	
Body-mass index, kg/m <sup>2</sup> , mean ± SD	23.0	± 5.7	23.8	± 6.9	.062

Note. <sup>a</sup>Other ethnic groups include: Jola, Serahuli, Manjago, Serer, Aku, and Balanta. <sup>b</sup>Other employment status includes: driver, security, and house girl/boy. <sup>c</sup>The exchange rate was ~US\$1.00 = GMD45.00. <sup>d</sup>Other individuals involved in the upbringing of victim as a child include: uncle, aunt, brother, sister, and namesakes.

A substantial proportion (25.6%) of male violence victimization in this study occurred in the home which has not been reported in previous studies. Since more than 55% of the patients were employed or self-employed (business owner), this result might reflect family responsibilities of men in The Gambia on the traditional role as a breadwinner of family who has to go outdoors during the day to bring home food on the table. The role of men

could be more challenging in an extended family setting where multiple nuclear families share responsibility and resources; thereby misunderstandings could escalate into physical confrontation in the home. As with high-income countries, strangers and friends were most common perpetrators (Gal et al., 2012), and being struck by an object followed by fist punching/leg-kicking and stabbing/cutting/piercing were the most common mechanisms of

**Table 3.** Comparisons of Behavioral and Social Characteristics Between Case and Control Patients.

Characteristic	Cases (n = 447)		Controls (n = 447)		p value
	n	(%)	n	(%)	
Verbal abuse in the past 12 months	262	(58.6)	165	(36.9)	<.001
Physical threats in the past 12 months	79	(17.7)	31	(6.9)	<.001
Physical abuse in the past 12 months	138	(30.9)	40	(9.0)	<.001
Cigarette smoking in the past week	196	(43.9)	134	(30.0)	<.001
Alcohol consumption in the past week	42	(9.4)	23	(5.2)	.014
Illicit drug use in the past week	30	(6.7)	14	(3.1)	.013
Multidimensional Scale of Perceived Social Support, mean $\pm$ SD					
Family	24.2	$\pm$ 4.4	24.1	$\pm$ 5.1	.466
Friends	23.7	$\pm$ 4.4	23.8	$\pm$ 4.5	.668
Significant others	24.1	$\pm$ 4.5	23.7	$\pm$ 5.3	.262
Domain-Specific Risk-Taking Scale, mean $\pm$ SD					
Social	14.8	$\pm$ 6.7	14.6	$\pm$ 6.6	.611
Recreational	9.7	$\pm$ 7.0	10.2	$\pm$ 7.2	.229
Health and safety	11.9	$\pm$ 6.9	12.1	$\pm$ 7.1	.763

**Table 4.** Results of the Conditional Logistic Regression Analysis of Risk Factors With Adjusted Odds Ratio (OR) and 95% Confidence Interval (CI) for Physical Violence in Gambian Men.

Characteristic	OR	(95% CI)	p value
Employment status			
Civil servant	1.00	Ref.	
Unemployed	1.18	[0.61, 2.29]	.621
Business	1.93	[1.16, 3.20]	.011
Student	1.32	[0.66, 2.65]	.438
Other <sup>a</sup>	2.02	[0.12, 34.91]	.629
Monthly household income <sup>b</sup> ( $\geq$ GMD14,000/ $<$ GMD14,000)	2.12	[1.06, 4.24]	.034
Number of male siblings ( $\geq$ 2/ $<$ 2)	2.20	[1.15, 4.21]	.017
Alcohol consumption in the past week (yes/no)	3.32	[1.25, 8.84]	.016
Verbal abuse in the past 12 months (yes/no)	1.63	[1.04, 2.56]	.033
Physical abuse in the past 12 months (yes/no)	5.10	[2.71, 9.62]	<.001

Note. <sup>a</sup>Other employment status includes: driver, security, and house girl/boy. <sup>b</sup>The exchange rate was ~US\$1.00 = GMD45.00.

injury (Brennan et al., 2006; Downing, Cotterill, & Wilson, 2003; Drijber et al., 2013). It is observed that, most of physical violence perpetrated by strangers and friends in The Gambia might arise in certain contexts and as a product of particular social encounters in sports-related activities and commercial vehicle garages, while fist punching may signify the use of readily available weapons.

The association between a business job and physical violence might result from work pressure emanating from market forces dealing in both goods and services. Most businesses in the country are small-scale, and operational practices often entail buying and selling of goods in the form of credit. This often results in unpaid credit and violent confrontations. In The Gambia, most of those who own small-scale retail businesses are predominantly Fula

and migrants. In contrast to the association between a lower household income and the risk of violent victimization in high-income countries (Brennan, Moore, & Shepherd, 2010; Faergemann et al., 2009), this study reported positive relationships of having a higher household income and number of male siblings with the risk of physical violence. Drawing on the lifestyle-routine activity theory, one possible explanation is that higher income may mean that individuals tend to spend more time away from the home and therefore are placed in situations conducive to crime and violence victimization (Cohen et al., 1981). A Gambian family consists of two or more generations in the same compound where all family members live and eat together (GBoS & ICF, 2014). This situation can be more challenging in the GBA, where 60% of the population lives on 1% of the land (GBoS & UNFPA,

**Table 5.** Comparisons of Injury Characteristics Between 161 Severe and 286 Minor/Moderate Injuries.

Characteristic	Severe injuries ( <i>n</i> = 161)		Non-severe injuries ( <i>n</i> = 286)		<i>p</i> value
	<i>n</i>	(%)	<i>n</i>	(%)	
Age (years)					
15–24	62	(41.1)	122	(44.7)	.679
25–34	56	(37.1)	99	(36.3)	
35–44	28	(18.5)	40	(14.7)	
≥45	5	(3.3)	12	(4.4)	
Time of injury					
06:00–11:59	50	(31.3)	75	(26.4)	.488
12:00–16:59	43	(26.9)	94	(33.1)	
17:00–20:59	34	(21.3)	54	(19.0)	
21:00–05:59	33	(20.6)	61	(13.7)	
Place of injury					
Street	50	(32.7)	101	(35.6)	.057
Home	28	(18.3)	84	(29.6)	
Public space	27	(17.7)	31	(10.9)	
Worksite	21	(13.7)	30	(10.6)	
Bar or restaurant	16	(10.5)	21	(7.4)	
Sports area or educational facility	11	(7.2)	17	(6.0)	
Mechanism of injury					
Fall by pushing	14	(8.70)	60	(21.0)	.001
Stab/cut/pierced	47	(29.2)	42	(14.7)	
Struck by an object	54	(33.5)	88	(30.8)	
Fist punching/leg kicking/head-butting	39	(24.2)	78	(27.3)	
Burn/stoning	7	(4.4)	18	(6.3)	
Weapon of injury					
Blunt object	10	(6.9)	21	(8.3)	.602
Bottle/glass	13	(8.9)	14	(5.5)	
Sharp object	32	(21.9)	49	(19.4)	
Fist punch/leg kick/head butt	79	(54.1)	142	(56.1)	
Hot object or liquid/stone	12	(8.2)	27	(10.7)	
Body part injured					
Lower extremity	8	(5.2)	30	(11.0)	.016
Upper extremity	46	(29.7)	60	(22.0)	
Thorax/abdomen/pelvis	6	(3.9)	18	(6.6)	
Head/neck	31	(20.0)	59	(21.6)	
Face	36	(23.2)	79	(29.0)	
General body pain	28	(18.1)	27	(10.0)	
Nature of injury					
Abrasion/contusion/laceration	144	(89.4)	256	(91.1)	.400
Dislocation/sprain/strain	5	(3.1)	12	(4.3)	
Internal body pain	12	(7.5)	13	(4.6)	
Cigarette smoking in the past week	91	(43.5)	105	(36.7)	<.001
Alcohol consumption in the past week	19	(11.8)	23	(8.0)	.191
Illicit drug use in the past week	16	(9.9)	14	(4.9)	.041

2013), with a household average of 8.2 persons (GBoS & ICF, 2014). Although this study did not explore how family size affects violent activities, overcrowding and limited availability of basic living needs (e.g., food) might lead to resource competition and subsequently violent

confrontations within and between families. Issues of property ownership, land use, and inheritance might also cause physical violence within the family, particularly in a polygamous family where male siblings might not share the same biological mother.



**Table 6.** Results of the Conditional Logistic Regression Analysis of Risk Factors With Adjusted Odds Ratio (OR) and 95% Confidence Interval (CI) for Severe Injuries From Physical Violence in Gambian Men.

Characteristic	OR	(95% CI)	p value
<b>Place of injury</b>			
Street	1.00	Ref.	
Home	0.80	[0.39, 1.63]	.531
Public space	2.59	[1.12, 5.95]	.026
Worksite	1.56	[0.68, 3.59]	.297
Bar or restaurant	1.03	[0.38, 2.82]	.948
Sports area or educational facility	2.31	[0.74, 7.23]	.152
<b>Mechanism of injury</b>			
Fall by pushing	1.00	Ref.	
Stab/cut/pierced	8.72	[3.29, 23.09]	<.001
Struck by an object	4.00	[1.72, 9.27]	.001
Fist punching/leg kicking/head-butting	2.91	[1.24, 6.86]	.014
Burn/stoning	5.65	[1.10, 29.10]	.038
<b>Body part injured</b>			
Lower extremity	1.00	Ref.	
Upper extremity	3.24	[1.08, 9.73]	.037
Thorax/abdomen/pelvis	0.69	[0.15, 3.12]	.632
Head/neck	2.04	[0.68, 6.17]	.205
Face	1.64	[0.57, 4.72]	.362
General body pain	2.78	[0.89, 8.68]	.079
Cigarette smoking in the past week	3.52	[1.93, 6.43]	<.001

Alcohol consumption is consistently associated with physical violence across studies (O'Brien et al., 2017; Sabina et al., 2017; Schuurman et al., 2015), although the magnitude of alcohol consumption varies. This study reported a high proportion (57%) of men aged 15–34 years who consumed alcohol prior to receiving an injury from physical violence. Those who engage in alcohol consumption may have increased their exposure to the motivated offender and their likelihood for victimization, since alcohol directly affects cognitive and physical functioning, making individuals more vulnerable to the offender (Macdonald et al., 2005). Alcohol consumption is associated with aggressive behaviors and an increased propensity of enhancing individuals to initiate violence (Budd, Tedstone, & Curry, 2003; Reed, Amaro, Matsumoto, & Kaysen, 2009). The government of The Gambia has recently banned the packaging of alcohol in small sachets which were very cheap and accessible; however, the sale of alcoholic drinks in other formulations and their packaging size still have no age restrictions by law. Conversely, unlike alcohol, laws on illicit drug use in The Gambia are adequately regulated and intensively enforced. This differential legislation and enforcement may result in many young men turning to alcohol consumption for intoxication.

As with findings in the United States (Richardson et al., 2016; Sunday et al., 2011), past violence victimization is a risk factor for physical violence, indicating that

physical violence can also recur among Gambian men. This phenomenon of recidivism among men might be partly due to men's approval of a retaliatory attitude and desire for revenge for a feeling of disrespect that can increase repeated victimization (Copeland-Linder et al., 2012). Anderson argues that the cultural code of the street where violence is viewed as a means to attain respect is a cultural adaptation to negative neighborhood conditions, family characteristics, and racial discrimination among African Americans due to a lack of faith in the police and the judicial system (Anderson, 2000). Nevertheless, there might be different codes of the street in The Gambia for the recurrence of violence victimization, and disputes over money to meet basic living needs for self and family members are more likely to trigger a violent event among men. Some other reasons including prejudice against male victims, fear of embarrassment, and ridicule by society (Drijber et al., 2013; Dutton & White, 2013; George & Yarwood, 2004) might also contribute to triggering a recurrence of physical violence in men.

The place of injury, injury mechanism, body part injured, and cigarette smoking was reported to increase the severity of injuries from physical violence. Severe injuries in public spaces in The Gambia may have occurred as a result of mob justice, particularly when a group of people physically assault an individual (Brennan et al., 2006). As with findings in the UK (Maxwell, Trotter, Verne, Brown, & Gunnell, 2007; Shepherd,

Shapland, Pearce, & Scully, 1990), certain mechanisms, including stabbing/cutting/piercing, being struck by an object, and a combination of fist punching, leg kicking, and head-butting were more likely to cause severe injuries. Use of sharp and blunt weapons like knives, cutlasses, metal objects, and stones can cause severe injuries (Luef, Lauritsen, & Faergemann, 2016), although they are not commonly seen during the violence. Alternatively, delays in the police response to crime scenes could also affect the occurrence of more-severe injuries during physical violence (Blackwell & Vaughn, 2003). The association between injuries to the upper extremities and severe violent injuries may reflect a tendency of victims to defend themselves from being hit on the head, since the head is a preferred target in male assaults (Cillo & Holmes, 2016). Alternatively, men may have missed their target when hitting a perpetrator and thus struck their hand or elbow against a hard object with force, resulting in a severe injury. Cigarette smoking was identified to be associated with carrying a weapon and severe peer violence (Walton et al., 2009), implying that smoking cigarettes might be an indicator of peer-influenced problematic behaviors in Gambian men. The mechanisms linking cigarette smoking and severe injuries from physical violence need to be further investigated.

There are several limitations to this study. First, the results may not be generalized to all men who sought medical care at the ERs/OPDs due to injuries from physical violence, since this study focused only on patients from government-managed health facilities in urban areas, and those treated in private health facilities and who live in rural areas might have different characteristics from the general population. Second, the information reported by participants could not be validated. Men who had been injured by partners or family members might have been less inclined than those in non-abusive family relationships to report their partners' or family member's negative attributes. Third, although control patients were carefully interviewed to ascertain whether they had presented complaints or health problems related to physical violence, misclassifying the injury cause of control patients as nonviolent could not be completely eliminated, which might have underestimated the effects of identified risk factors on injuries from physical violence. Finally, several risk factors for violent injuries in Gambian men were identified in the present study; the identification of these factors can facilitate individual-focused interventions of violence prevention. On the other hand, the theory of structural violence advocates that social arrangement may put individuals and populations in harm's way (Farmer et al., 2004). In other words, violence comes from the context of social structure (e.g., social injustice and inequity) rather than from individuals' characteristics or behaviors only. Future research, either

qualitative or quantitative approach, may further identify structural factors or social contexts associated with an increased risk of violence in Gambian or African societies for developing its structural interventions.

## Conclusions

Risk factors for injury from physical violence and its severity in Gambian men were identified, of which some (a business job, higher household income, and more male siblings) are different from those reported in other countries. In The Gambia and other African societies, gender stereotypes of physical violence against men still exist as the society has still not adapted to offering men the recognition and same services of social support as women. With identification and modification of these violence risk factors, specific public health programs such as hospital-based violence screening and referral and psycho-educational interventions, as well as community-based sensitization strategies, conflict resolution counseling, and social support and educational programs may be developed for preventing physical violence and severe injuries among Gambian or African men.

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