



# Association of Food Insecurity With Multiple Forms of Interpersonal and Self-Directed Violence: A Systematic Review

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## Abstract

Economic stress, broadly defined, is associated with an increased likelihood of multiple forms of violence. Food insecurity is a distinct economic stressor and material hardship that is amenable to programmatic and policy intervention. To inform intervention and identify gaps in the current evidence base, we conducted a systematic review to synthesize and critically evaluate the existing literature regarding the association between food insecurity and five forms of interpersonal and self-directed violence: intimate partner violence (IPV), suicidality, peer violence and bullying, youth dating violence, and child maltreatment, in high-income countries. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines and searched six electronic databases from their start date through February of 2022. We included studies that examined food insecurity as the exposure and an outcome measure of IPV, suicide, suicidality, peer violence, bullying, youth dating violence, or child maltreatment; were peer-reviewed and published in English; reported quantitative data; and took place in a high-income country. We identified 20 relevant studies. Nineteen studies found that food insecurity was associated with an increased likelihood of these forms of violence. Results highlight the potential for programs and policies that address food insecurity to function as primary prevention strategies for multiple forms of violence and underscore the importance of trauma-informed approaches in organizations providing food assistance. Additional theory-driven research with validated measures of food insecurity and clearly established temporality between measures of food insecurity and violence is needed to strengthen the existing evidence base.

## Keywords

food insecurity, hunger, intimate partner violence, suicide, bullying, youth violence, child maltreatment

## Introduction

Household food insecurity, or lack of sufficient food due to financial and resource constraints, (Coleman-Jensen et al., 2021), is a pressing public health concern worldwide (FAO, 2021) that has only been exacerbated by the COVID-19 pandemic (Ling et al., 2022). Food insecurity is a form of material hardship, defined as difficulty meeting a variety of basic needs (Nelson, 2011). While connected to poverty, existing studies show that poverty and income are only moderately correlated with measures of material hardship, including food insecurity (Iceland & Bauman, 2007; Rodems & Shaefer, 2020; Sullivan et al., 2008). Thus, food insecurity is widely considered to be a distinct form of deprivation and a unique stressor for individuals and families (Rodems & Shaefer, 2020; Weon & Rothwell, 2020). While most individuals experiencing food insecurity live in low- and middle-income countries, food insecurity is also pervasive in high-income countries (FAO,

2021). As of 2020, the prevalence of moderate or severe food insecurity in high-income countries was almost 8% (FAO, 2021), with 10% of households in the United States (Coleman-Jensen et al., 2021) and 14% of adults in the United Kingdom experiencing food insecurity (Pool & Dooris, 2021). Importantly, food insecurity is consistently associated with an increased risk of poor outcomes in childhood, adolescence, and adulthood (Gundersen & Ziliak, 2015).

Multiple forms of violence, including intimate partner violence (IPV), suicide and suicidality, peer violence and

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bullying, youth dating violence, and child maltreatment, are also critical public health issues. By age 18 years, more than one-third of U.S. children experience a child protective services investigation for suspected maltreatment (Kim et al., 2017). Data from the 2019 U.S. Youth Risk Behavior Survey indicate that 1 in 12 teens experienced physical or sexual dating violence in the past year (CDC, 2022). Global estimates show that more than one in three students ages 13–15 years are victims of bullying (UNICEF, 2017), and 27% of women ages 15–49 years have experienced IPV. More than 700,000 people die by suicide each year (WHO, 2021a, 2021b), with increasing rates of suicide in many high-income countries (Commonwealth Fund, 2020; WHO, 2021b, 2021c). Similar to food insecurity, experiences of violence are consistently associated with an increased risk of poor health outcomes across the life course (Rivara et al., 2019).

Theory and empirical research studies suggest that economic stress broadly, and food insecurity specifically, is associated with an increased risk of experiencing or perpetrating multiple forms of violence (Fedina et al., 2022; Hatcher et al., 2022). The general strain theory (GST) provides a theoretical basis for conceptualizing the association between food insecurity and violence (Hong et al., 2021; Neppel et al., 2015; Wadsworth & Achenbach, 2005). The GST hypothesizes that sources of strain can cause individuals to experience emotions such as anxiety, depression, and anger (Hong et al., 2021). While some may have access to resources that help them to adaptively cope with these feelings, others may not have access to positive coping strategies (Hong et al., 2021). This, in turn, can lead to maladaptive functioning and internalizing and externalizing of these emotions through violent behaviors (Hong et al., 2021).

The GST also posits the concept of vicarious strain. Through this lens, hardships and trauma experienced by others, such as food insecurity experienced by a family member, can also lead to an increased risk of violent behaviors and experiences (Hong et al., 2021). This is particularly relevant in the context of food insecurity and children. In many cases, even if a household experiences severe financial strain and food insecurity, caregivers often take steps to ensure that children in the home do not experience substantial food deficits by, for example, substantially reducing their own food intake (Coleman-Jensen et al., 2021). Under the GST, the vicarious strain that a child experiences by witnessing their caregiver's food insecurity can lead to externalizing and internalizing behaviors (Hong et al., 2021) and potentially contribute to experiences and perpetration of violence.

In summary, food insecurity may contribute to both internalizing and externalizing behaviors which may then give rise to acts of self-directed and/or interpersonal violence. While the GST provides clear theoretical support for an association between experiences of food insecurity and multiple forms of violence, it is unclear to what extent extant empirical research supports these theoretical associations. Food insecurity is a modifiable risk factor that can be addressed by programs and policies (e.g., the Supplemental Nutrition Assistance Program

[SNAP], the Special Supplemental Nutrition Program for Women, Infants, and Children [WIC]), as well as food banks and pantries (Byrne & Just, 2022). A comprehensive assessment of the evidence base regarding the association between food insecurity and multiple forms of violence can provide practitioners and policymakers with the information needed to understand and address these pressing public health issues. It can also provide researchers with the information needed to guide future studies to fill remaining gaps in knowledge.

We aimed to systematically synthesize and critically evaluate the existing research literature on the association of food insecurity with multiple and distinct forms of interpersonal and self-directed violence, including IPV, suicide and suicidality, peer violence and bullying, youth dating violence, and child maltreatment. While food insecurity and violence are global concerns, the context surrounding food insecurity is vastly different in high-income countries from that in low- and middle-income countries. To facilitate a focused discussion of the implications of existing research for policy and practice, we focused this review on studies conducted in high-income countries.

## Methods

### Search Strategy

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. In collaboration with a trained health sciences librarian, we developed search terms related to food insecurity, IPV, suicide and suicidality, peer violence and bullying, youth dating violence, and child maltreatment (Dahlberg & Krug, 2002). We searched six electronic databases from their start date through February of 2022: PubMed, Scopus, PsycInfo, CINAHL, Social Work Abstracts, and Sociological Abstracts (Supplemental Methods 1). We also searched the reference lists of included articles for potential articles missed in the electronic search.

### Eligibility Criteria

We included studies that examined food insecurity as the specific exposure of interest; included an outcome measure of IPV, suicide, suicidality, peer violence, bullying, youth dating violence, or child maltreatment, including witnessing parental violence (Leeb et al., 2008, p.18); were peer-reviewed and published in English; reported quantitative data; and had taken place in a high-income country as defined by the World Bank (World Bank, n.d.). We excluded studies that evaluated a program as we were interested in understanding these associations in the absence of programmatic intervention.

### Screening Process

We first conducted double-blind screening of the titles and abstracts of the articles collected through the electronic database search to identify potentially relevant articles. We then

conducted a double-blind review of full texts to further assess eligibility. At each stage, we resolved discrepancies through discussion and consensus.

### **Data Extraction**

We created a data extraction tool that captured the following information: study aims, design, data sources, and sample; study sample characteristics; exposure and outcome measures; covariates; analytic approach and results; and conclusions, strengths, and limitations. A primary reviewer extracted data from each article, and a secondary reviewer verified this information.

## **Results**

### **Study Selection**

The electronic database search returned 2,415 articles (Supplemental Figure 1). We screened the titles and abstracts of these articles and determined that 2,272 articles were not relevant. We assessed the full text of the remaining 143 articles and determined that 123 articles did not meet eligibility criteria. We completed extraction for the 20 articles that fully met inclusion criteria.

### **Study Characteristics, Design, and Data Sources**

Study characteristics and definitions of food insecurity and violence are presented in Table 1. Of the 20 studies identified, 14 studies took place in the United States, four in Canada, one in Estonia, and one in France. Fourteen studies used a cross-sectional design, five used a prospective cohort design, and one used a retrospective cohort design. Seventeen studies used population-representative data, or data from a representative sample of the population of interest, as defined by the study authors. The remaining three studies did not specify the type of data sample.

Eight studies specifically focused on youth and adolescents, five studies focused on young adults ( $\leq 35$  years), one study focused on older adults ( $\geq 60$  years), and six studies included participants of a broad range of ages. Of the 14 studies that provided additional demographic information on study participants, eight included a majority of White individuals and three included primarily Black individuals. Seven studies had a majority or all women participants. One study sample consisted of all veterans, most of whom were men. All studies recruited participants, and one study used administrative data in addition to study collected data.

### **Food Insecurity Measures and Definitions**

Measures of food insecurity ranged from one question to 18-item questionnaires. Of the eight studies that used an 18-item questionnaire, five studies used the Household Food

Security Survey Module developed by the U.S. Department of Agriculture (USDA) which has been psychometrically validated among diverse populations (Conroy et al., 2019; Helton et al., 2019; Hromi-Fiedler et al., 2009; Jackson & Vaughn, 2017; Jackson et al., 2018; Kamdar et al., 2021) and three used an adapted version of the 18-item USDA Household Food Security Survey Module, adapted for use in Canada (Davison et al., 2015; Men et al., 2020, 2021). Of the 12 studies that did not use the 18-item USDA Module, only one study used a validated measure, the USDA 6-item short form version of the Household Food Security Module (Ricks et al., 2016).

The nine studies (Conroy et al., 2019; Davison et al., 2015; Helton et al., 2019; Jackson & Vaughn, 2017; Jackson et al., 2018; Kamdar et al., 2021; Men et al., 2020, 2021) that used the 18-item USDA Household Food Security Survey Module or the 6-item short form version (Ricks et al., 2016) defined food insecurity, per the USDA, as limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways (USDA, 2022a). Four studies defined food insecurity as concern about running out of food (Baer et al., 2015; Johnson et al., 2021; Nagata et al., 2019; Schwab-Reese et al., 2016). Other definitions included trouble affording enough to eat (Adhia et al., 2020), not eating enough or not eating balanced meals (Alaimo et al., 2002; Jackson et al., 2019; Pryor et al., 2016), and going hungry (Brinkman et al., 2021; Paquin et al., 2021; Stickley et al., 2018). Fifteen studies captured experiences of food insecurity in the past 12 months (Baer et al., 2015; Davison et al., 2015; Helton et al., 2019; Jackson & Vaughn, 2017; Jackson et al., 2018, 2019; Johnson et al., 2021; Kamdar et al., 2021; Men et al., 2020, 2021; Nagata et al., 2019; Paquin et al., 2021; Pryor et al., 2016; Ricks et al., 2016; Schwab-Reese et al., 2016). Other timeframes included food insecurity experienced in the past 30 days (Brinkman et al., 2021), in the past 6 months (Conroy et al., 2019), and at various points across the life course (i.e., in childhood, early adulthood, or late adulthood) (Adhia et al., 2020; Stickley et al., 2018).

### **Violence Outcome Measures and Definitions**

Measures of interpersonal and self-directed violence varied depending on the specific form of violence examined and are summarized in Table 1. Within each form of violence, no studies measured the form of violence in the same way. All outcomes were based on self-report or caregiver report for some forms of violence among children and youth. Of the five studies that focused on IPV, two examined IPV perpetration only (Adhia et al., 2020; Schwab-Reese et al., 2016) and three examined experiences of IPV only (Baer et al., 2015; Conroy et al., 2019; Ricks et al., 2016). Three studies (Adhia et al., 2020; Ricks et al., 2016; Schwab-Reese et al., 2016) examined physical IPV only, while two studies (Baer et al., 2015; Conroy et al., 2019) examined physical, sexual,

**Table I. Study Characteristics.**

Intimate Partner Violence-Focused Studies					
Citation	Study Population	Food Insecurity Measure	Definition of Food Insecurity	Violence Outcome	Definition of Violence Outcome
Adhia et al. (2020)	Population representative data from the U.S. LIFE Experiences Study, N = 1,617 ages 31–77 years	1 question operationalized as having trouble affording enough to eat	Having trouble affording enough to eat in early adulthood and/or in late adulthood.	Perpetration of physical IPV	Perpetration of physical IPV (slapping, kicking, hitting, punching, or beating up a partner or loved one) in early adulthood (19–30 years) and later adulthood (31+ years)
Baer et al. (2015)	Data from the U.S. Online Advocate, N = 400 ages 15–25 years	2 questions from the 18-item USDA Household Food Security Module	Concern about running out of food or food not lasting in the past 12 months.	Experiencing physical, verbal, or sexual IPV	Experiencing physical, verbal, or sexual IPV in the past 12 months
Conroy et al. (2019)	Population representative data from the U.S. Women's Interagency HIV Study, N = 2,343, mean age 47 years	18-item USDA Household Food Security Module	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 6 months; marginal food security defined as affirmative answers to 1–2 items, low food security defined as affirmative answers to 3–5 items, and very low food security defined as affirmative answers to 6–10 items.	Experiencing physical, psychological, or sexual IPV	Experiences of sexual or physical IPV (being forced to have sexual contact, experiencing serious physical violence) or psychological IPV (being threatened, prevented from leaving or entering the home, prevented from seeing friends) by a partner in the past 6 months
Ricks et al. (2016)	Population representative data from the California Women's Health Survey, N = 16,562 ages ≥18 years	USDA Household Food Security Module, 6-item short form	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; low food security defined as affirmative answers to 2–4 items and very low food security defined as affirmative answers to ≥5 items.	Experiencing physical IPV	Experiencing minor (being pushed, shoved, grabbed, slapped, had something thrown at) or severe (kicked, bit, hit with a fist, beaten up, choked, used a knife on, fired a gun at) physical IPV in the past 12 months
Schwab-Reese et al. (2016)	Population representative data from the U.S. National Longitudinal Study of Adolescent to Adult Health, N = 11,499 ages 24–32 years	1 question: "In the past 12 months, was there a time when you/your household worried whether food would run out before you would get money to buy more?"	Concern about running out of food in the past 12 months.	Perpetration of physical IPV	Threats of physical IPV, perpetrating physical IPV (pushing, shoving, slapping, kicking, hitting, throwing something), and perpetrating physical IPV resulting in injury in the past 12 months of the most recent relationship
Suicide-Focused Studies					
Citation	Study Population	Food Insecurity Measure	Definition of Food Insecurity	Violence Outcome	Definition of Violence Outcome
Alaimo et al. (2002)	Population representative data from U.S. National Health and Nutrition Survey III, N = 754 ages 15–16 years	1 question operationalized as an inadequate amount of food intake due to a lack of resources.	Sometimes or often inadequate amount of food intake due to lack of resources.	Suicidal ideation and suicide attempt	Ever a period of 2 weeks or longer where one or more of the following symptoms occurred: thought a lot about death, wanted to die, thought of committing or attempted suicide
Brinkman et al. (2021)	Population representative data from Vermont Youth Risk Behavior Surveillance Survey, N = 11,836 in Grades 6–8	1 question: "During the past 30 days, how often did you go hungry because there was not enough food in your home?"	Sometimes, most of the time, or always going hungry because there was not enough to eat in the past 30 days.	Suicidal ideation	Ever seriously thought about killing oneself
Davison et al. (2015)	Population representative data from Canadian Community Health Survey, N = 5,270 ages 18–59 years	18-item survey based on the USDA Household Food Security Module modified for Canada	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; moderate food insecurity defined as affirmative answers to 2–5 items and severe food insecurity defined as affirmative answers to ≥5 items.	Suicidal ideation	Ever seriously considered committing suicide and whether this happened in the past 12 months

(continued)

**Table 1. (continued)**

Suicide-Focused Studies					
Citation	Study Population	Food Insecurity Measure	Definition of Food Insecurity	Violence Outcome	Definition of Violence Outcome
Kamdar et al. (2021)	Population representative from the U.S. National Health and Nutrition Examination Survey, N=2,630, mean age 62 years	18-item USDA Household Food Security Module	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months with marginal food security defined as affirmative answers to 1–2 items, low food security defined as affirmative answers to 3–7 items, and very low food security defined as affirmative answers to 6–18 items.	Suicidal ideation	Thoughts of being better off dead or hurting oneself in the past 2 weeks
Men et al. (2021)	Population representative data from the Canadian Community Health Survey, N= 40,000 ages 12–24 years	18-item survey based on the USDA Household Food Security Module modified for Canada	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; marginal food security defined as affirmative answers to 1 item, moderate food security defined as affirmative answers to 2–5 items, and very low food security defined as affirmative answers to ≥4 items.	Suicidal ideation	Seriously considering suicide in the past 12 months
Men et al. (2020)	Population representative data from Canadian Community Health Survey linked to Canadian Vital Statistics Database and Discharge Abstract Database, N=510,010 ages 18–82 years	18-item survey based on the USDA Household Food Security Module modified for Canada	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; marginal food security defined as affirmative answers to 1 item, moderate food insecurity defined as 2–5 affirmative items, and severe food insecurity defined as affirmative answers to ≥5 items.	Death by suicide	Death by suicide using ICD-10 codes for suicide deaths
Nagata et al. (2019)	Population representative data from the U.S. National Longitudinal Study of Adolescent to Adult Health, N= 14,786 ages 24–32 years	1 question: “In the past 12 months, was there a time when (you/your household were/was) worried whether food would run out before you would get money to buy more?” 3 questions modified from the Cornell-Radimer Hunger Scale and the USDA Household Adult Food Security Module 10-item questionnaire	Concern about running out of food in the past 12 months.	Suicidal ideation	Serious thoughts of committing suicide in the past 12 months; suicide attempt in the past 12 months
Pryor et al. (2016)	Population representative data from the French Tempo Cohort study, N= 1,109 ages 18–35 years	Cornell-Radimer Hunger Scale and the USDA Household Adult Food Security Module 10-item questionnaire	Not eating enough, eating balanced meals, eating varied meals in the past 12 months.	Suicidal ideation	Thoughts of suicide in the past 12 months
Stickley et al. (2018)	Population representative data from the Estonia Health Interview Survey, N= 2,455, older adults (mean age 72.5 years)	1 question: “Did it ever happen in your childhood that you had to go to bed hungry?”	Going to bed hungry seldom, sometimes, or often before age 14 years.	Suicidal ideation	Recurrent thoughts of death or suicide in the past 4 weeks

(continued)



**Table 1. (continued)**

Peer Violence/Bullying-Focused Studies					
Citation	Study Population	Food Insecurity Measure	Definition of Food Insecurity	Violence Outcome	Definition of Violence Outcome
Jackson and Vaughn (2017)	Population representative data from the U.S. Early Child Longitudinal Study, N=6,531–7,028 kindergarten to age 15 years	18-item USDA Household Food Security Survey Module	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; food insecurity defined as affirmative answers to $\geq 3$ items.	Perpetration of fighting or bullying at school	Perpetration of fighting or bullying at school over the past school year
Johnson et al. (2021)	Population representative data from Maryland Youth Risk Behavior Survey/Youth Tobacco Survey, N=40,188 in Grades 9–12	I question: “In the past 12 months how often did the food your family bought not last and they did not have money to get more?”	Concern about running out of food in the past 12 months.	Suicidal ideation and fighting at school	Seriously considering suicide in the past 12 months; being in a physical fight on school property in the past 12 months
Paquin et al. (2021)	Data from Québec Longitudinal Study of Child Development, N=1,441 ages 1.5–15 years	I question: “In the past 12 months, has a member of your family ever experienced being hungry because the family had run out of food or money to buy food?”	Family member going hungry because the family ran out of food or money to buy more food in the past 12 months.	Experiencing peer bullying	Experiencing overt (being shoved, hit, kicked, pushed) or relational (not being allowed to be part of a group) bullying by peers
Child Maltreatment-Focused Studies					
Citation	Study Population	Food Insecurity Measure	Definition of Food Insecurity	Violence Outcome	Definition of Violence Outcome
Helton et al. (2019)	Data from the U.S. Fragile Families and Childhood Wellbeing Study, N=2,330 ages 3–5 years	18-item USDA Household Food Security Module	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; food insecurity defined as affirmative answers to $\geq 3$ items. Transient food insecurity defined as experiencing food insecurity at either wave, and persistent food insecurity defined as experiencing food insecurity at both waves.	Caregiver perpetration of psychological and physical aggression toward children	Caregiver psychological aggression (shouted, yelled, screamed at, cursed, threatened to send the child out of the house or spank them, called the child names like dumb or lazy) or physical aggression (shook, hit with a hard object, spanked, slapped, punched) toward their child in the past year
Jackson et al. (2019)	Population representative data from U.S. National Survey of Children’s Health, N=46,508–46,889 ages 0–17 years	I question on food situation in household in the past 12 months: (1) we could always afford to eat good nutritious meals, (2) we could always afford enough to eat but not always the kinds of food we should eat, (3) sometimes we could not afford enough to eat, and (4) often we could not afford enough to eat.	Not being able to afford enough to eat in the past 12 months, with mild food insecurity defined as being able to afford enough to eat but not always able to afford nutritious foods, and moderate to severe food insecurity defined as sometimes or often not being able to afford enough to eat.	Child witnessing physical violence between family members	Child ever saw parents or adults slap, hit, kick, or punch one another in the home
Jackson et al. (2018)	Population representative data from U.S. Early Childhood Longitudinal Study—Birth Cohort, N=4,556–4,570 birth to early childhood	18-item USDA Household Food Security Module	Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways in the past 12 months; food insecurity defined as affirmative answers to $\geq 3$ items.	Exposure to violence and child violent victimization in the home	Child was exposed to or a victim of a violent act in the home (physical fighting, destruction of property, etc.) in the past year

Note. ICD-10 = International Classification of Diseases, 10th Revision; IPV = intimate partner violence; USDA = U.S. Department of Agriculture.

psychological, and verbal IPV. Two of the studies measured experiences of IPV within the last 12 months (Baer et al., 2015; Ricks et al., 2016). Of the ten studies that examined suicidality, seven studies measured suicidal ideation (Brinkman et al., 2021; Davison et al., 2015; Johnson et al., 2021; Kamdar et al., 2021; Men et al., 2021; Pryor et al., 2016; Stickley et al., 2018), two studies measured suicidal ideation and suicide attempts (Alaimo et al., 2002; Nagata et al., 2019), and one examined death by suicide (Men et al., 2020). Three studies measured lifetime suicidal ideation and/or suicide attempts (Alaimo et al., 2002; Brinkman et al., 2021; Davison et al., 2015), while three measured suicidal ideation and/or suicide attempts within the last 12 months (Men et al., 2021; Nagata et al., 2019; Pryor et al., 2016). Of the three studies focused on peer violence and bullying, one measured peer violence as physical fighting at school (Johnson et al., 2021), one examined physical fighting or bullying at school (Jackson & Vaughn, 2017), and one measured both overt (e.g., being shoved, hit, or kicked) and relational (e.g., being intentionally left out of a peer group) bullying (Paquin et al., 2021). Two studies measured involvement in peer violence within the last 12 months (Jackson & Vaughn, 2017; Johnson et al., 2021). Of the three child maltreatment-focused studies, measures included the child witnessing physical violence in the home (Jackson et al., 2019), child exposure to violence and violent victimization in the home (Jackson et al., 2018), and caregiver psychological and physical aggression toward the child (Helton et al., 2019). Two studies measured child exposure to or experiences of violence in the home in the last year (Helton et al., 2019; Jackson et al., 2018). No studies examining youth dating violence were identified.

## Key Results

Table 2 shows key results from each study, in addition to covariates included in multivariable models to adjust for bias due to confounding, organized by the form of interpersonal or self-directed violence examined.

**Intimate partner violence.** Of the five studies that examined the association between food insecurity and IPV (Adhia et al., 2020; Baer et al., 2015; Conroy et al., 2019; Ricks et al., 2016; Schwab-Reese et al., 2016), all but one (Baer et al., 2015) found that food insecurity was associated with an increased likelihood of experiencing or perpetrating IPV. Two studies (Conroy et al., 2019; Ricks et al., 2016) found that among women, very low food security was more strongly associated with experiencing physical (Ricks et al., 2016) and both physical and psychological (Conroy et al., 2019) IPV than higher levels of food security. One study (Schwab-Reese et al., 2016) showed that food insecurity, as compared to not experiencing food insecurity, was associated with physical IPV perpetration in young adults. One study (Adhia et al., 2020) found an association between food insecurity in

early or late adulthood and physical IPV perpetration later in life. One study did not find an association between food insecurity in late adolescence or early adulthood and experiences of IPV (Baer et al., 2015).

**Suicidality and suicide.** Ten studies found that food insecurity was associated with an increased likelihood of suicidality (Alaimo et al., 2002; Brinkman et al., 2021; Davison et al., 2015; Johnson et al., 2021; Kamdar et al., 2021; Men et al., 2020, 2021; Nagata et al., 2019; Pryor et al., 2016; Stickley et al., 2018). Four studies showed that experiencing higher levels of food insecurity was more strongly associated with suicidal ideation than experiencing lower levels of food insecurity in young adults (Brinkman et al., 2021; Men et al., 2021) and across adulthood (Davison et al., 2015; Kamdar et al., 2021). One study (Stickley et al., 2021) found similar associations of varying levels of childhood hunger with suicidal ideation in late adulthood. One study (Men et al., 2020) showed that those who experienced severe food insecurity were more likely to die by suicide than those who were food secure (Men et al., 2020). Two studies found that food insecurity was associated with an increased likelihood of suicidality in high school-aged youth (Alaimo et al., 2002; Johnson et al., 2021), and two found this association in young adults (Nagata et al., 2019; Pryor et al., 2016).

**Peer violence and bullying.** Three studies examined the association of peer violence and bullying with food insecurity (Jackson & Vaughn, 2017; Johnson et al., 2021; Paquin et al., 2021). Two studies (Jackson & Vaughn, 2017; Johnson et al., 2021) found that experiencing food insecurity was associated with fighting at school among high school-aged youth. One study (Paquin et al., 2021) found that those who experienced persistent food insecurity from early childhood up to age 15 years were more likely to experience both overt (e.g., being shoved) and relational (e.g., being excluded from a group) peer bullying.

**Child maltreatment.** Three studies found that food insecurity was associated with an increased likelihood of various measures of child maltreatment. (Helton et al., 2019; Jackson et al., 2018, 2019). One study found that food insecurity was associated with an increased likelihood of exposure to violence in the home among children (Jackson et al., 2019), and one found that food insecurity was associated with exposure to violence and violent victimization in the home among young children (Jackson et al., 2018). Results from both studies indicated that higher levels of food insecurity were associated with a higher likelihood of children witnessing violence in the home (Jackson et al., 2018, 2019). One study showed that both transient and persistent food insecurity were associated with increased caregiver-to-child physical and psychological aggression among caregivers of young children (Helton et al., 2019).

**Table 2.** Study Results.

IPV-Focused Studies	
Citation	Key Results
Adhia et al. (2020)	Loss of food security in adulthood associated with late onset IPV perpetration (OR = 10.33, 95% CI [1.93, 55.41]).
Baer et al. (2015)	Marginal (OR = 1.0, 95% CI [0.4, 2.3]), low (OR = 0.98, 95% CI [0.9, 3.4]), and very low (OR = 1.4, 95% CI [0.6, 3.0]) food security not associated with experiencing IPV among youth and young adults.
Conroy et al. (2019)	Very low food security associated with experiencing sexual or physical IPV (OR = 3.12, 95% CI [1.88, 5.19]) and psychological IPV (OR = 3.03, 95% CI [1.67, 5.50]). Marginal food security associated with experiencing psychological IPV (OR = 2.12, 95% CI [1.22, 3.69]), but not sexual or physical IPV (OR = 1.37, 95% CI [0.82, 2.32]). Low food security not associated with experiencing sexual or physical IPV (OR = 1.29, 95% CI [0.78, 2.14]) or psychological IPV (OR = 1.72, 95% CI [0.98, 3.00]).
Ricks et al. (2016)	Low (OR = 2.01, 95% CI [1.51, 2.67]) and very low food security (OR = 4.93, 95% CI [3.68, 6.60]) associated with experiencing IPV among women.
Schwab-Reese et al. (2016)	Food insecurity associated with perpetrating threats or minor physical IPV (OR = 1.56, 95% CI [1.28, 1.90]), perpetrating severe physical IPV (OR = 1.64, 95% CI [1.25, 2.15]), and perpetrating IPV resulting in injury (OR = 2.46, 95% CI [1.71, 3.58]) among young adults.
Suicide-Focused Studies	
Citation	Key Results
Alaimo et al. (2002)	Food insecurity associated with thoughts of death (OR = 2.0, 95% CI [1.2, 3.3]), desire to die (OR = 3.4, 95% CI [1.5, 7.5]), suicidal ideation (OR = 1.9, 95% CI [0.8, 4.2]), and suicide attempts (OR = 5.0, 95% CI [1.7, 14.6]) among youth ages 15–16 years. Sometimes (OR = 2.11, SE = 0.18) and most of the time or always (OR = 2.29, SE = 0.31) experiencing food insecurity associated with suicidal ideation among middle school youth.
Brinkman et al. (2021)	Moderate (OR = 1.32, 95% CI [1.06, 1.64]) and severe (OR = 1.77, 95% CI [1.42, 2.23]) associated with suicidal ideation among adults.
Davison et al. (2015)	Very low (OR = 3.84, 95% CI [2.05, 7.20]) and low (OR = 2.15, 95% CI [1.08, 4.27]), but not marginal (OR = 1.34, 95% CI [0.64, 2.82]) food security associated with suicidal ideation among veterans
Kamdar et al. (2021)	Marginal (RR = 1.77, 95% CI [1.21, 2.60]), moderate (RR = 2.44, 95% CI [1.83, 3.26]), and severe (RR = 6.49, 95% CI [4.34, 9.71]) food insecurity associated with suicidal ideation among youth and young adults.
Men et al. (2021)	Marginal (HR = 1.60, 95% CI [1.06, 2.40]) and severe (HR = 2.21, 95% CI [1.50, 3.24]), but not moderate (HR = 1.08, 95% CI [0.73, 1.60]) food insecurity associated with death by suicide among adults.
Men et al. (2020)	Food insecurity associated with suicidal ideation (OR = 2.76, 95% CI [2.14, 3.55]) and attempting suicide (OR = 1.52, 95% CI [0.86, 2.68]).
Nagata et al. (2019)	

(continued)



**Table 2. (continued)**

Suicide-Focused Studies		
Citation	Key Results	Covariates
Pryor et al. (2016)	Food insecurity associated with suicidal ideation overall (RR = 3.23, 95% CI [1.55, 6.75]) and among men (RR = 5.73, 95% CI [1.99, 17.82]). Food insecurity not associated with suicidal ideation among women (RR = 1.82, 95% CI [0.64, 5.18]).	Household income, childhood abuse and neglect, past behavioral problems, internalizing/externalizing symptoms, parent depression, parent alcohol use disorder, BMI
Stickley et al. (2018)	Sometimes (OR = 1.74, 95% CI [1.10, 2.74]) or often (OR = 1.17, 95% CI [0.73, 1.87]) going to be hungry in childhood associated with suicidal ideation. Seldom going to bed hungry in childhood not associated with suicidal ideation (OR = 1.07, 95% CI [0.60, 1.89]).	Age, gender, ethnicity, household income, education, marital status, major depressive episode in past 2 weeks, smoking status, binge drinking in past 12 months, chronic diseases, social support
Peer Violence/Bullying-Focused Studies		
Citation	Key Results	Covariates
Jackson and Vaughn (2017)	Food insecurity associated with fighting at school (PR = 2.14, 95% CI [1.84, 2.49]) among youth in Grades 9–12	Age, race/ethnicity, socioeconomic status score, neighborhood disadvantage, neuro-psychological deficits, depression, low parental involvement, physical punishment, BMI
Johnson et al. (2021)	Food insecurity associated with suicidal ideation (PR = 2.20, 95% CI [1.92, 2.53]) and fighting at school (PR = 2.14, 95% CI [1.84, 2.49]) among youth in Grades 9–12.	Gender, race/ethnicity, grade level
Paquin et al. (2021)	Children with a high-risk trajectory of food insecurity more likely to experience peer bullying (B = 0.43, 95% CI [0.08, 0.77]) and severe peer bullying (OR = 2.54, 95% CI [1.18, 5.50]) at age 15 years.	Gender, household income, parental mental health
Child Maltreatment-Focused Studies		
Citation	Key Results	Covariates
Helton et al. (2019)	Transient (psychological B = 0.116, $p < .05$ ; physical B = 0.183, $p < .05$ ; total B = 0.300, $p < .05$ ) and persistent (psychological B = 0.344, $p < .05$ ; physical B = 0.320, $p < .05$ ; total B = 0.663, $p < .05$ ) food insecurity associated with increased caregiver-to-child physical, psychological, and total aggression.	Age, gender, sex, household income and receipt of assistance, maternal age, depression, and impulsivity
Jackson et al. (2019)	Mild (OR = 1.54, 95% CI [1.35, 1.69]) and moderate or severe (OR = 2.66, 95% CI [2.26, 3.09]) food insecurity associated with children ages 0–17 years witnessing violence in the home.	Age, gender, race, household income-to-poverty ratio and receipt of nutrition assistance, caregiver highest education level and employment status, adult caregivers married and cohabitating, caregiver physical and mental health
Jackson et al. (2018)	Preschool-aged children who experienced food insecurity at Waves 1, 2, and 3 of data collection were more likely to have been exposed to or victims of violence in the home. Wave 1 (OR = 1.54, 95% CI [1.04, 2.29]), Wave 2 (OR = 2.38, 95% CI [1.59, 3.56]), and Wave 3 (OR = 2.67, 95% CI [1.85, 3.83]). Children living in homes where FI was very persistent (across all three waves) were significantly more likely to have been exposed to or victims of violence in the home (OR = 5.86, 95% CI [3.02, 11.38]) as compared to in homes with no reported history of food insecurity.	Socioeconomic status score, maternal and paternal race, marital status, marital conflict, depression, antisocial behavior, and conflict

Note. BMI = body mass index; CI = confidence interval; HR = hazards ratio; IPV = intimate partner violence; OR = odds ratio; PR = prevalence ratio; RR = risk ratio; B = beta coefficient.

**Youth dating violence.** No studies examining the association between food insecurity and youth dating violence were identified.

## Discussion

To inform current and future research, practice, and policy, we conducted a comprehensive systematic review and synthesis of the existing literature on the association between food insecurity and multiple forms of violence. We identified 20 peer-reviewed articles that examined the association between food insecurity and four forms of interpersonal and self-directed violence: IPV, suicide and suicidality, peer violence and bullying, and child maltreatment. Notably, though our initial conceptualization of this review included examining the association of food insecurity with experiences and perpetration of youth dating violence, our search did not return any such studies, identifying a clear gap in the evidence base and direction for future studies.

Collectively, results from the reviewed studies align with the core hypothesis under GST, that food insecurity, a source of strain, may increase vulnerability for developing externalizing and internalizing behaviors that increased the risk for experiencing or perpetrating interpersonal and self-directed violence. While studies consistently revealed an association between food insecurity and experiencing or perpetrating multiple forms of violence, there are several methodological considerations that have implications for interpretation of results and that provide directions for future research. These include limitations specific to measures of food insecurity and violence used, study population characteristics, and limited use of causal inference tools and theoretical frameworks to guide study design and analytic approaches. Table 3 provides an overview of limitations and suggestions for future research.

### *Food Insecurity Measurement*

The most common measure of food insecurity across reviewed studies was the 18-item USDA Household Food Security Survey Module or the shortened 6-item version (Conroy et al., 2019; Davison et al., 2015; Helton et al., 2019; Jackson & Vaughn, 2017; Jackson et al., 2019; Kamdar et al., 2021; Men et al., 2020, 2021; Ricks et al., 2016). Among studies that did not use the validated USDA questionnaire, most of the studies measured food insecurity with a single question (Adhia et al., 2020; Alaimo et al., 2002; Brinkman et al., 2021; Jackson et al., 2019; Johnson et al., 2021; Nagata et al., 2019; Paquin et al., 2021; Schwab-Reese et al. 2016; Stickley et al., 2018). Overall, 1-item food insecurity measures tended to focus on a household's concern about or trouble affording food or going hungry due to limited financial resources.

The USDA 18-item Food Security Survey Module, first developed in 1995 and revised in 2012 (Carillo-Álvarez

et al., 2021), is considered the most comprehensive and valid questionnaire for assessing food insecurity in high-income countries (Jones et al., 2013). The 18-item questionnaire assesses multiple aspects of household food insecurity and captures experiences of food insecurity for both adults and children in a household. The 6-item short form version is an acceptable alternative to the 18-item questionnaire, though it does not ask about children's food security or about the most severe forms of adult food insecurity (USDA, 2012c). There is debate surrounding the validity of other short questionnaires for assessing food insecurity, particularly 1-item questions. Food insecurity is a multidimensional construct encompassing lack of financial resources to afford sufficient food, anxiety about running out of food, skipping meals due to lack of money or food, and inability to purchase quality foods to support a balanced diet for both adults and children in a household (USDA, 2022b). While shorter questionnaires are less burdensome to complete, they do not necessarily capture the full intensity and complexity of food insecurity and may miss households and families that experience some aspects of food insecurity but not others (Carillo-Álvarez et al., 2021). Given that food insecurity was measured with one to three questions in more than half of the reviewed studies, future research that uses the full 18-item USDA Household Food Security Survey Module or the 6-item short form is needed to confirm associations and to better understand whether specific aspects of food insecurity are more strongly associated with different forms of violence than others. The USDA 18-item questionnaire captures food insecurity along a continuum, allowing researchers to examine different levels of the severity of food insecurity. While some included studies examined associations between varying levels of food insecurity and violence, showing an increasing likelihood of violence at higher levels of food insecurity (Brinkman et al., 2021; Conroy et al., 2019; Davison et al., 2015; Helton et al., 2019; Jackson et al., 2018, 2019; Kamdar et al., 2021; Men et al., 2020, 2021; Ricks et al., 2016), additional research is needed to understand the magnitude and nature of these specific associations, including potential non-linear associations.

### *Temporality Between Food Insecurity and Violence*

Lack of temporality between measures of food insecurity and violence is an important limitation of this body of research. Establishing temporality between the exposure and outcome is key to understanding complex causal pathways in observational research. Only seven of the reviewed studies were able to establish temporality between the measure of food insecurity and the measure of violence used (Conroy et al., 2019; Helton et al., 2019; Jackson & Vaughn, 2017; Jackson et al., 2018; Men et al., 2020; Paquin et al., 2021; Stickley et al., 2018). Thus, in the remaining 13 studies, it is difficult to determine whether food insecurity may have been a

**Table 3.** Study Limitations and Suggestions for Future Research.

Limitation	Citations	Suggestions for Future Research
Did not use a validated measure of food security	Adhia et al. (2020); Baer et al. (2015); Brinkman et al. (2021); Davison et al. (2015); Johnson et al. (2021); Paquin et al. (2021); Pryor et al. (2016); Schwab-Reese et al. (2016); Stickley et al. (2018)	Use USDA Household Food Security Module, long or short form, and adapt the items to the local context if needed; use items in the USDA Household Food Security Module to examine severity of food insecurity for more nuanced results; if a validated measure of food insecurity is not available in data, discuss what aspects of food insecurity are not captured in the available questions and how this might affect results
Temporality not established between food insecurity and violence outcome	Adhia et al. (2020); Alaimo et al. (2002); Baer et al. (2015); Brinkman et al. (2021); Davison et al. (2015); Jackson et al. (2019); Johnson et al. (2021); Kamdar et al. (2021); Men et al. (2021); Nagata et al. (2019); Pryor et al. (2016); Ricks et al. (2016); Schwab-Reese et al. (2016)	Use existing longitudinal data or conduct new longitudinal research; link existing survey data with measures of food insecurity to administrative data (e.g., child protective services, vital statistics, law enforcement, emergency department, hospital discharge, electronic medical record data) with information on violence
IPV-focused studies that examined experiences of IPV included only or majority women	Baer et al. (2015); Conroy et al. (2019); Ricks et al. (2016)	Examine both experiences and perpetration of IPV among both men, women, and non-binary individuals
IPV-focused studies that only examined physical IPV	Adhia et al. (2020); Ricks et al. (2016); Schwab-Reese et al. (2016)	Include measures of emotional/psychological and sexual IPV
Suicide-focused studies that examined suicidal ideation only	Brinkman et al. (2021); Davison et al. (2015); Kamdar et al. (2021); Men et al. (2021); Pryor et al. (2016); Stickley et al. (2018)	Conduct future studies focused on suicide attempts and death by suicide to inform downstream prevention
Peer violence/bullying-focused studies that focused on fighting and bullying at school only	Jackson and Vaughn (2017); Johnson et al. (2021)	Focus on additional settings where youth may experience or perpetrate violence (e.g., neighborhoods, after school “hang outs”) to gain a fuller understanding of peer violence
Child maltreatment-focused studies that included only or majority biological mothers and relied on their self-report of children experiencing or witnessing violence	Jackson et al. (2018); Helton et al. (2019); unclear for Jackson et al. (2019)	Include reports of child experiences of or witnessing violence from all child caregivers or from multiple sources (e.g., primary caregiver and teacher); link existing survey data to child protective services data to capture maltreatment/violence not reported by caregivers
Did not specify how potential confounders in the association of food insecurity with violence outcome(s) were identified	Alaimo et al. (2002); Baer et al. (2015); Brinkman et al. (2021); Helton et al. (2019); Jackson & Vaughn (2017); Jackson et al. (2018, 2019); Johnson et al. (2021); Kamdar et al. (2021); Nagata et al. (2019); Men et al. (2020, 2021); Ricks et al. (2016); Paquin et al. (2021); Pryor et al. (2018); Stickley et al. (2018)	Use DAGs to identify confounders, including those unmeasured in data; discuss how unmeasured confounders might affect results; publish DAGs in peer-reviewed publications so that assumptions about links between variables are transparent
Did not explicitly name the role of structural racism in experiences of food insecurity and violence	Adhia et al. (2020); Alaimo et al. (2002); Baer et al. (2015); Brinkman et al. (2021); Conroy et al. (2019); Davison et al. (2015); Helton et al. (2019); Jackson & Vaughn (2017); Jackson et al. (2018, 2019); Kamdar et al. (2021); Men et al. (2020, 2021); Nagata et al. (2019); Paquin et al. (2021); Pryor et al. (2016); Ricks et al. (2016); Schwab-Reese et al. (2016); Stickley et al. (2018)	Acknowledge the role of structural racism in disproportionately burdening Black, Hispanic, and Indigenous communities with experiences of food insecurity and violence and discuss the implications for policy and practice
Lack of theory to support hypothesized associations and inform study design	Adhia et al. (2020); Alaimo et al. (2002); Baer et al. (2015); Brinkman et al. (2021); Conroy et al. (2019); Davison et al. (2015); Helton et al. (2019); Jackson & Vaughn (2017); Jackson et al. (2018, 2019); Johnson et al. (2021); Kamdar et al. (2021); Men et al. (2020, 2021); Nagata et al. (2019); Paquin et al. (2021); Pryor et al. (2018); Stickley et al. (2018)	Draw on relevant theories such as the family stress model, social causation hypothesis, general strain theory, catalyst model of aggression to inform study design and DAG construction

Note. USDA = U.S. Department of Agriculture; DAG = directed acyclic graph.

contributing or causal factor in experiences or perpetration of violence, or vice versa. Of the studies that were able to establish temporality, one examined IPV (Conroy et al., 2019), two examined suicidality (Men et al., 2020; Stickley et al., 2018), two examined peer violence (Jackson & Vaughn 2017; Paquin et al., 2021), and two examined child maltreatment (Helton et al., 2019; Jackson et al., 2018), highlighting the need for additional research with clear temporality for all forms of violence assessed in this review. It may be possible to leverage existing longitudinal data, such as data from the Fragile Families and Child Wellbeing Study and the National Longitudinal Study of Adolescent to Adult Health, in future research to establish temporality and examine experiences of food insecurity and violence across the life course. It may also be possible to establish temporality by linking existing survey data with measures of food insecurity to administrative data sources with information on violence outcomes, such as child protective services, vital statistics, or electronic medical record data. However, for some forms of violence, new prospective data collection may be needed. For example, studies capturing day-to-day experiences of food insecurity and violence using Ecological Momentary Assessment methods may be useful for capturing acute associations and further understanding the direction and mechanisms of underlying causal pathways.

### *Study Populations and Measures of Violence*

There were limitations to the study populations and measures of violence used in some studies. Specifically, most studies that examined child maltreatment studies included only or majority biological mothers and relied on their self-report of children experiencing or witnessing violence (Helton et al., 2019; Jackson et al., 2018), potentially missing maltreatment unknown to their mothers or perpetrated by their mothers and thus unreported due to social desirability. Including reports of child experiences of violence from all child caregivers or from multiple sources, such as the child's primary caregiver and teacher, may help accurately capture this outcome. In addition, using data from child protective services agencies to understand associations of food insecurity with official reports of maltreatment can help bolster this specific area of research.

Most studies that examined experiences of IPV included only or majority women participants (Baer et al., 2015; Conroy et al., 2019; Ricks et al., 2016). While experiences of IPV are more common among women than men, one in three men in the United States experience IPV during their lifetime (Smith et al., 2018). Future studies can build in this area by examining experiences and perpetration of IPV among female, male, and non-binary identifying individuals and within the same relationship. Furthermore, most studies that measured IPV perpetration focused on physical IPV only (Ricks et al., 2016; Schwab-Reese et al., 2016). Studies can build in this area by examining the association of food

insecurity with multiple types of IPV perpetration, including emotional/psychological, economic, and sexual IPV, to inform tailored prevention and intervention.

Similarly, most suicide-focused studies examined suicidal ideation only (Brinkman et al., 2021; Davison et al., 2015; Kamdar et al., 2021; Men et al., 2021; Pryor et al., 2016; Stickley et al., 2018). Future research can expand our understanding in this area by including measures of suicide attempts and death by suicide to further inform prevention efforts. In addition, two of the three peer violence and bullying-focused studies examined fighting and bullying at school (Jackson & Vaughn, 2017; Johnson et al., 2021). Future studies can help expand our understanding of the potential implications of food insecurity for peer violence by focusing on additional settings where youth may experience or perpetrate violence, such as after school “hang outs.”

Only 14 of the reviewed studies provided demographic data. Of these studies, six had predominantly White participants (Ricks et al., 2016; Men et al., 2021; Kamdar et al., 2021; Johnson et al., 2021; Jackson et al., 2017; Adhia et al., 2020). Due to structural racism, particularly in the United States, Black, Hispanic, and Indigenous populations are disproportionately impacted by food insecurity and experiences of violence (Odoms-Young, 2018). Understanding nuanced associations between food insecurity and violence among the populations most impacted is critical to informing programmatic and policy intervention. Furthermore, 19 of the 20 reviewed studies did not explicitly name the role of structural racism in contributing to experiences of food insecurity and violence, despite many studies adjusting for race and ethnicity in multivariable models. Given the disproportionate impact of food insecurity and violence among populations of color, this represents a missed opportunity to highlight and understand an underlying driver of these experiences.

### *Limited Use of Causal Inference Methods and Theoretical Frameworks*

Of the 20 reviewed studies, only one specified the method for selection of covariates included in multivariable models to adjust for bias due to confounding (Schwab-Reese et al., 2016). In addition, only one study used a theory or conceptual framework to guide study hypotheses and analysis (Schwab-Reese et al., 2016). Future research on the association of food insecurity with violence can be strengthened by use of both causal inference tools and theory to justify and support the overall study design. For example, future studies may benefit from use of directed acyclic graphs (DAGs). DAGs are graphical depictions of causal associations among variables that can be used to identify potential confounders (i.e., common causes of both the exposure and outcome) and guide selection of covariates to adjust for in multivariable models to minimize confounding bias (Austin et al., 2019; Greenland et al., 1999). We created an example DAG (Supplemental Figure 2) and specified hypothesized causal



pathways among the variables included using existing evidence, theoretical expectations, and our subject matter expertise (Austin et al., 2019; Greenland et al., 1999). We analyzed our DAG and determined that, under our assumptions regarding causal mechanisms among multiple variables, we would need to adjust for measures of poverty, structural racism (e.g., measures of residential segregation or interpersonal discrimination), gender inequality (e.g., measures of gender differences in economic participation and educational attainment or gender discrimination), and prior experiences of violence or trauma to account for bias due to confounding. Importantly, the specific variables included on a DAG will likely differ depending on the form violence examined, and our example DAG is purely for illustrative purposes.

In addition to guiding covariate selection, DAGs are useful for helping researchers to clarify and clearly communicate the assumptions they are making regarding causal associations among multiple interrelated variables. In our DAG, for example, we conceptualized mental health and substance use disorders as mediators of the association between food insecurity and violence (i.e., as variables on the causal pathway from food insecurity to violence). Other researchers may conceptualize mental health and substance use disorders as confounders in the association between food insecurity and violence. Without clear graphical depictions or explanation in the text, it is difficult to determine why researchers selected specific covariates for inclusion in their multivariable models and for future research to build on the specific assumptions made.

Future research will also likely benefit from a greater use of theory to guide study hypotheses and to complement causal inference tools in generating study hypotheses and determining appropriate analytic approaches. Theories that are particularly relevant to understanding associations between food insecurity and violence are GST (Hong et al., 2021; Neppl et al., 2015; Wadsworth & Achenbach, 2005), the Social Causation Hypothesis (Wadsworth & Achenbach, 2005), the Catalyst Model of Aggression (Schwab-Reese et al., 2016), and the family stress model (Conger et al., 2000). All provide a framework for understanding the pathways by which economic and material hardships, such as food insecurity, can impact functioning in families and relationships by creating stress, depleting emotional and relational resources, causing emotional and behavioral problems, and triggering conflict. Under these theories, negative impacts of stress are posited to have a cascading effect on multiple forms of interpersonal and self-directed violence. Grounding future research in theory can strengthen study conceptualization, interpretation of results, ability to infer causality, and translation of findings into practical applications for programs and policy.

Of note, in using causal inference tools and theory to inform future research, it will be important to acknowledge and consider the complex interconnections between multiple forms of violence (Decker et al., 2018; Wilkins et al., 2014).

For example, the reviewed studies indicated that food insecurity is associated with peer violence and bullying, and experiencing peer violence or bullying then has the potential to increase risk for suicidality (Holt et al., 2015). On our DAG, we simplified these interconnections by indicating that prior experiences of trauma/violence can impact later experiences of multiple forms of violence. In examining the association of food insecurity with a specific form of violence, considering the role of other forms of violence will be important.

### *Implications for Policy and Practice*

Despite these methodological limitations, results from the studies included in this review have several implications for policy and practice (Table 4). Importantly, unlike some risk factors for violence, food insecurity is amenable to programmatic and policy intervention. Given associations between food insecurity and IPV, suicidality, peer violence and bullying, and child maltreatment, expansion of programs that assist individuals and families in affording or accessing food, such as school breakfast and lunch programs, SNAP, and WIC, may function as primary prevention strategies for multiple forms of violence. A large body of literature indicates that in the United States, state adoption of policies that expand eligibility for food purchasing assistance through SNAP is associated with decreases in household food insecurity (Han, 2016; Shaefer & Gutierrez, 2013; Tiehen, 2021). By decreasing household food insecurity, state adoption of these SNAP policies may help to reduce violence. Indeed, a recent study showed that state adoption of these SNAP policies was associated with substantial reductions in child protective services investigations for suspected maltreatment (Austin et al., 2023). These results highlight the potential for policies that expand eligibility for food assistance and welfare programs in high-income countries to contribute to reductions in both food insecurity and violence. This is especially relevant in the context of the COVID-19 pandemic (U.S. Global Leadership Coalition, 2022). Several studies indicate that food insecurity increased during the pandemic and was particularly exacerbated among households with children (Parekh et al., 2021).

Community programs such as food banks or pantries and soup kitchens play a vital role in helping individuals and families experiencing food insecurity in most high-income countries (Pollard and Booth, 2019). Co-locating violence prevention and intervention resources and services within such community programs may help to increase accessibility and effectively reach populations in need, with food insecurity functioning as a concrete point of intervention to prevent or potentially reduce violence. This would likely require enhanced partnerships between food banks and other community organizations and health systems providing violence prevention and intervention services. Importantly, these efforts may be challenging in communities with few



**Table 4.** Critical Findings and Implications for Policy and Practice.

Critical Findings	Citations	Implications for Policy or Practice
Food insecurity associated with perpetration of IPV	Adhia et al. (2020); Schwab-Reese et al. (2016)	Addressing food insecurity among couples could be a strategy to reduce and/or prevent IPV.
Food insecurity associated with experiencing IPV	Conroy et al. (2019); Ricks et al. (2016)	Food banks and other resources that aim alleviate food insecurity could provide IPV screening, resources, service referrals, or programming.
Food insecurity associated with suicidality in youth and adolescents	Alaimo et al. (2002), Brinkman et al. (2021), Johnson et al. (2021), Men et al. (2021)	Expansion of programs such as school breakfast and lunch, in addition to co-locating mental health and material resource interventions, could serve as suicide and suicidal ideation prevention in youth.
Current and past food insecurity associated with suicidality in adults	Davison et al. (2015), Kamdar et al. (2021), Men et al. (2020), Nagata et al. (2019), Pryor et al. (2016), Stickley et al. (2018)	The effects of food insecurity can stretch across life span. Early prevention and intervention for both food insecurity and violence are critical.
Food insecurity associated with fighting at school and experiencing peer bullying among youth and adolescents	Jackson and Vaughn (2017), Johnson et al. (2021), Paquin et al. (2021)	Youth at risk for or experiencing food insecurity should be provided with increased psychosocial services. Children perpetrating or experiencing peer violence should be screened for food insecurity.
Household food insecurity associated with children witnessing or experiencing violence in the home	Helton et al. (2019), Jackson et al. (2018, 2019)	Expansion of programs that assist families in accessing food (e.g., Supplemental Nutrition Assistance Program in the United States, welfare programs in other high-income countries) could be a strategy for preventing or decreasing violence in the home and child maltreatment.

Note. IPV = intimate partner violence.

violence prevention and intervention resources. However, existing research shows acceptability and effectiveness of chronic disease programming located within food banks in the United States (An et al., 2019; Feeding America, 2018; Humana, 2020), and lessons learned from these endeavors can be used as a foundation for similar approaches focused on violence prevention and intervention. Community organizations and health systems providing violence prevention and intervention services can also screen and provide resources to mitigate food insecurity. In-house food pantries may be particularly beneficial and may have shown promising impacts when embedded within health clinics (Mirsky et al., 2021). This indicates that it may be possible to embed food pantries within other types of organizations as well.

Given demonstrated associations between experiences of food insecurity and violence, community programs that address food insecurity can likely benefit from operating within a trauma-informed framework. Trauma-informed frameworks focus on enhancing safety, trust, transparency, collaboration, peer support, choice, and cultural humility (Hecht et al., 2018). Existing studies point to the effectiveness and importance of trauma-informed approaches. Since 2017, more than 50 food pantries in the United States have implemented a trauma-informed intervention called the Nutrition Pantry Program (USDA, 2016d). The intervention provides food pantries with resources, tools, and training to become client-centered and trauma-informed by acknowledging how adversity and stress affect health and avoiding

shaming and stigmatization promoting resilience among those experiencing food insecurity (Leah's Pantry, 2022; USDA, 2016d). A recent evaluation found that after implementing the intervention, food pantries improved with respect to use of trauma-informed client food distribution and policies. The program is part of the USDA's SNAP-Ed Toolkit and is free to implement (USDA, 2016d).

### Limitations

This systematic review has limitations. First, while we created comprehensive search strings with the assistance of a trained health sciences librarian and hand-searched article reference lists for articles missed by our electronic search, it is possible that we missed relevant studies. Second, our systematic review aimed to examine the association between food insecurity and multiple forms of violence in high-income countries. However, most studies were U.S.-based. Thus, our conclusions may not be applicable to all high-income countries. Future reviews are needed to assess the state of the evidence regarding the association of food insecurity with violence in low- and middle-income countries. Third, although we aimed to include studies on the association of food insecurity with youth dating violence, we did not identify any such studies. Fourth, though two reviewers examined each included article, it is possible that we incorrectly captured or missed specific details during the data extraction process. Fifth, given that consensus is currently

lacking as to the “gold standard” tool to use when assessing results from observational studies (Farrah et al., 2019; Page et al., 2018), we did not use a risk of bias tool. Instead, we created a thorough data extraction form to collect information from each article reviewed, including potential methodological limitations, which we discussed in detail.

## Conclusions

Results from the 20 studies included in this systematic review showed evidence of an association between food insecurity and four forms of interpersonal and self-directed violence: IPV, suicidality, peer violence and bullying, and child maltreatment. The results highlight the potential for programs and policies that address food insecurity to function as primary prevention strategies for multiple forms of violence. Increased funding for and creation of such programs and policies could make important contributions to violence prevention. Future research should continue to examine the implications of food insecurity and material hardship more broadly on interpersonal and self-directed violence, with a specific focus on youth dating violence, the association of multiple dimensions of food insecurity with violence, and the impacts of the COVID-19 pandemic on these associations.

## Declaration of Conflicting Interests

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

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded by an award from the Centers for Disease Control and Prevention, National Center for Injury Control and Prevention (R01CE003334).

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## Supplemental Material

Supplemental material for this article is available online.

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### Author Biographies

**Madeline Frank, BA**, is a student in the dual degree master's program in Social Work and Public Health at the University of North Carolina at Chapel Hill's School of Social Work and Gillings School of Global Public Health in the Department of Maternal, Child, and Family Health. She is a graduate of Kenyon College and has both direct practice and macro-level work experience in community health and child welfare settings. She is a research assistant at UNC's Injury Prevention Research Center. Her research interests include the health effects of childhood trauma, integrating social workers into healthcare teams, and mitigating racial health disparities.

**Leah Daniel, BS**, is a final year MSW-MPH student at the UNC School of Social Work and Gillings School of Global Public Health.

She is pursuing concentrations in Community, Management, and Policy Practice and Maternal, Child, and Family Health. Her research interests center around the perinatal period and access to care, with particular interest in rural populations. She is currently a Graduate Research Assistant with the Maternal Health Learning and Innovation Center where she is a member of the Evaluation team. She also works as a Project Coordinator for a project focusing on rural mothers and a manualized trauma-focused practice.

**Caroline N. Hays**, BA, BSN, is a Master of Public Health student in the Department of Maternal, Child, and Family Health at the Gillings School of Global Public Health at UNC Chapel Hill. She holds bachelor's degrees in Biology and in Nursing. She has a clinical background in nursing, practicing as a labor and delivery, school and community health, primary and prenatal care, global pediatric, and public health pandemic nurse over the past eight years. Her research interests include inequities in perinatal morbidity and mortality and barriers to access to healthcare. As a graduate research fellow in The UNC Center of Excellence in Maternal and Child Health Education, Science and Practice, she studied substance use, food insecurity, and violence in families. She currently works with the UNC Family Medicine Evaluation of Chatham Hospital Maternity Care Center, contributing to ongoing monitoring and evaluation of a family medicine model of rural perinatal care and analyzing the impacts of COVID-19 and the nursing shortage on the rural perinatal healthcare workforce. She also works as a research assistant with the UNC Department of Maternal and Child Health, analyzing outcomes and project managing for the Clinical Scholars National Leadership Program and the ACOG National Leadership Institute.

**Meghan E. Shanahan**, PhD, is an associate professor with more than 10 years of experience as a researcher who specializes in child health and well-being. The underlying motivation for her research is to improve the health and developmental trajectories of children. Her research focuses on adverse events that potentially influence these trajectories and prevent children from realizing their full potential. Since child maltreatment is one obvious insult to the health and development of children, documenting the magnitude, etiology, and impact of child maltreatment has been a focus of her work. Examining prevention strategies to reduce child abuse and neglect is another main focal point of her research. She has evaluated prevention strategies at both the family and the policy level. She is committed to translating research into tangible products and policies that have a positive impact on children and families.

**Rebecca B. Naumann**, PhD, is an assistant professor in the Department of Epidemiology and core faculty at UNC's Injury Prevention Research Center. Her main area of research is injury prevention, largely in the areas of road traffic injury and drug overdose prevention. Her research examines injury trends and risk and protective factors for injuries, as well as effective injury prevention interventions. She regularly works with state and local partners to support innovative injury prevention collaborations and coalition building efforts. Methodologically, she has experience and interest in applying systems science methods to injury prevention.

**H. Luz McNaughton Reyes**, PhD, is an assistant professor in the Department of Health Behavior. Her research focuses on the etiology and prevention of violence, substance use, and sexual risk behaviors across the life course, with a particular focus on adolescent populations. The two focal areas of her current program of research are (1) understanding the developmental pathways that lead to adolescent dating violence and (2) the development and evaluation of interventions to prevent health risk behaviors during the early life course. She has also worked extensively throughout the Central America region on health sector research and intervention projects related to reproductive health and rights. She currently instructs the required advanced research methods course for doctoral students in the Department of Health Behavior.

**Anna E. Austin**, PhD, is an assistant professor in the Department of Maternal and Child Health and Core Faculty at the UNC Injury Prevention Research Center. She is trained in epidemiology and maternal and child health with a research focus on injury and violence prevention among children and families. Her current research centers on the primary prevention of adverse childhood experiences, specifically child abuse and neglect; substance use among pregnant and parenting people; and population-level strategies, including those that address material hardships, to prevent injuries and violence and promote child and family well-being. She has experience and interest in applying advanced statistical methods, linking existing survey and administrative data sources, and partnering with state and local agencies to advance the maternal and child health research and practice agenda. She has partnered with the Injury and Violence Prevention Branch, Women's and Children's Health Section, and State Center for Health Statistics at the North Carolina Division of Public Health as well as the North Carolina Division of Health Benefits and the Wake County Division of Child Welfare on research and practice related to child abuse and neglect and substance use disorders.