Prevalence and Associated Characteristics of Emergency Department Visits by Women after Non-Fatal Intimate Partner Strangulation and Subsequent Diagnostic and Treatment Experiences: A Mixed-Methods Study

By

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Abstract

Non-fatal intimate partner strangulation (NF-IPS) is a severe and often under-reported violence tactic. Posing a very real threat to health and life for substantial numbers of women, NF-IPS is increasingly being recognized as a significant risk factor for serious negative health outcomes and future homicide. The emergency department (ED) serves as a "safety net" for vulnerable patients such as victims of intimate partner violence, though little is known about ED visit prevalence or characteristics of those presenting to EDs after NF-IPS. The purpose of this study is to provide data to support accurate, timely ED diagnosis and care for, and effective communication of risk to, women who survive strangulation by an abusive partner. This dissertation provides an integrative review of existing literature on NF-IPS in ED settings, a quantitative analysis of nine years of national ED data examining visit and hospital variables, and findings from a mixed-methods study triangulating and integrating national survey data with interviews and medical record reviews to explore characteristics and experiences of post-strangulation ED care-seeking by women. The resulting knowledge provides important considerations regarding clinical assessment, intervention and prevention efforts for this vulnerable population, as well as recommendations for public policy and future research on this specific violence tactic.

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Dedication

This dissertation is dedicated to the loving memories of:

- My grandfather, George J. Monachino Sr., for his deep love and faith. This dissertation was successfully defended on what would have been his 90th birthday;
- My aunt, Noreen Levitt Tschudy, who inspires me to work on behalf of women whose voices can no longer be heard;
- My Navy "battle buddy," CDR Marsha Heineman Hanly, who taught me strength, sacrifice and trust;
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Dissertation Organization

This dissertation is organized into five chapters. Chapter 1 provides introductory and background foundation for the study, the purpose and specific aims, and the conceptual framework for this research. Chapter 2 (Manuscript 1) was published— *Patch MA, Anderson JC, Campbell JC. Injuries of Women Surviving Intimate Partner Strangulation and Subsequent Emergency Health Care Seeking: An Integrative Evidence Review, 44(4): 384-3*. This review integrates recent literature on non-fatal intimate partner strangulation (NF-IPS) of women and their subsequent emergency department (ED) care-seeking in order to identify existing gaps and inform the methodological approach for the study. An addendum to Chapter 2 summarizes updates to the NF-IPS literature since publication of Manuscript 1. Chapter 3 (Manuscript 2) is a publication-ready paper presenting results from a cross-sectional national dataset analysis spanning 2006-2014, describing the prevalence and associated characteristics of strangulation-coded U.S. ED visits by women among visits coded for intimate partner violence (IPV). Chapter 4 (Manuscript 3) is a publication-ready paper mixing quantitative injury, symptom and diagnostic imaging code results from this same dataset with qualitative findings from interviews and medical records, exploring visit context, care-seeking behaviors, and communication of NF-IPS-related diagnoses and health risks. Finally, Chapter 5 provides a summary of the findings from all three manuscripts. This chapter discusses study as well as research, practice and policy implications.

CHAPTER 1: INTRODUCTION

> "It's—like, when he was choking, I could feel myself gasping for air. And it was like with each breath that was coming, it was just enough and I'm slowly losing it. And those thoughts was just he's going to kill me. He's not going to let me go. And it was just how he had his hands around my neck and I could see his eyes. The rage was just—and he was saying, 'I'm going to kill you. Be able to kill you.' Like, he's going to do it." (Study participant, "Sophie")

Background and Rationale

Intimate partner violence (IPV) is a serious health problem involving physical, sexual and/or psychological harm inflicted by a current or former partner or spouse.[1] Over 12 million women and men in the U.S. are estimated to have suffered some form of violence from an intimate partner in the past year; nearly 24 women per minute.[2] Approximately one in four women and one in seven men have experienced severe physical intimate partner violence, as reported in the same U.S. general population survey.[2]

One severe and often under-reported violence tactic involves attempted strangulation of a current or former intimate partner. Differentiated from other types of natural disease or accidental injuries, strangulation is a unique method of violence.[3] Strangulation, defined as external pressure to the neck that closes blood vessels and/or air passages and deprives one of oxygen,[3] has been equated to the torture of drowning and waterboarding.[4] This act frequently leads to asphyxia which, as applied to a forensic setting, is simply that "a body does not receive or utilize adequate amounts of oxygen."[3] The extent of injury resulting from strangulation depends on the exact anatomical location of applied pressure, amount of pressure, duration of pressure, and surface area of the pressure zone,[5] in addition to neck musculature thickness and strength.[6] Occlusion of

neck vessels can occur with considerably less pressure than that needed to completely obstruct tracheal airflow,[7] or even to open a can of soda. Total constriction of the carotids can induce unconsciousness in 10-15 seconds and cause death in minutes.[3,7,8]

Non-fatal intimate partner strangulation (NF-IPS) has been increasingly recognized as a significant risk factor for serious negative health outcomes such as carotid artery dissection,[9-12] stroke,[10,11,13] seizures,[10] PTSD,[12,14] anxiety and depression.[12-15] NF-IPS is also an important predictor of future lethal violence, increasing women's risk by seven-fold for being murdered by a partner.[16] In the most recent National Intimate Partner and Sexual Violence Survey (NISVS, 2011),[2] approximately 10% of female respondents reported surviving a strangulation attack by a current or former intimate partner at least once in their lifetime. This can be extrapolated to approximately 11 million U.S. adult women. The estimated prevalence ratio in the 2011 NISVS shows NF-IPS to be 13 times higher in women than men, with men's lifetime prevalence proportion the same as women's 12-month prevalence proportion (0.7%), suggesting an extreme gender disparity.[2]

Thus, being strangled by their current or former intimate partner is a very real threat to health and life for significant numbers of women. Sorenson, Joshi and Sivitz's systematic review, regarding NF-IPS of women, compiled and compared prevalence findings from 23 articles spanning 11 surveys from nine countries. They reported past-year strangulation prevalence between 0.4% to 2.4% and lifetime prevalence of 3.0% to 9.7%, with the U.S. estimates being highest in both time frames. In contrast, Glass and colleagues' 11-city case-control study of domestic violence (DV) homicide and attempted homicide victims in comparison to abused controls found that 27% of the total sample

experienced past NF-IPS (10% of abused controls, 45% of attempted homicides, 43% of completed homicides).[16] Statistics reported by Sorenson and colleagues[4] were informed by general population surveys, including those who have not experienced intimate partner violence. Taken together, this data indicates a considerable number of women subjected to strangulation, with higher prevalence among women abused by partners and an even higher prevalence in more severely abused populations, such as those seeking shelter or emergency care or nearly killed by a partner. Collectively, these data indicate an urgent need to examine clinical care for NF-IPS including diagnosis, intervention, and prevention of further violence by referrals to appropriate services.

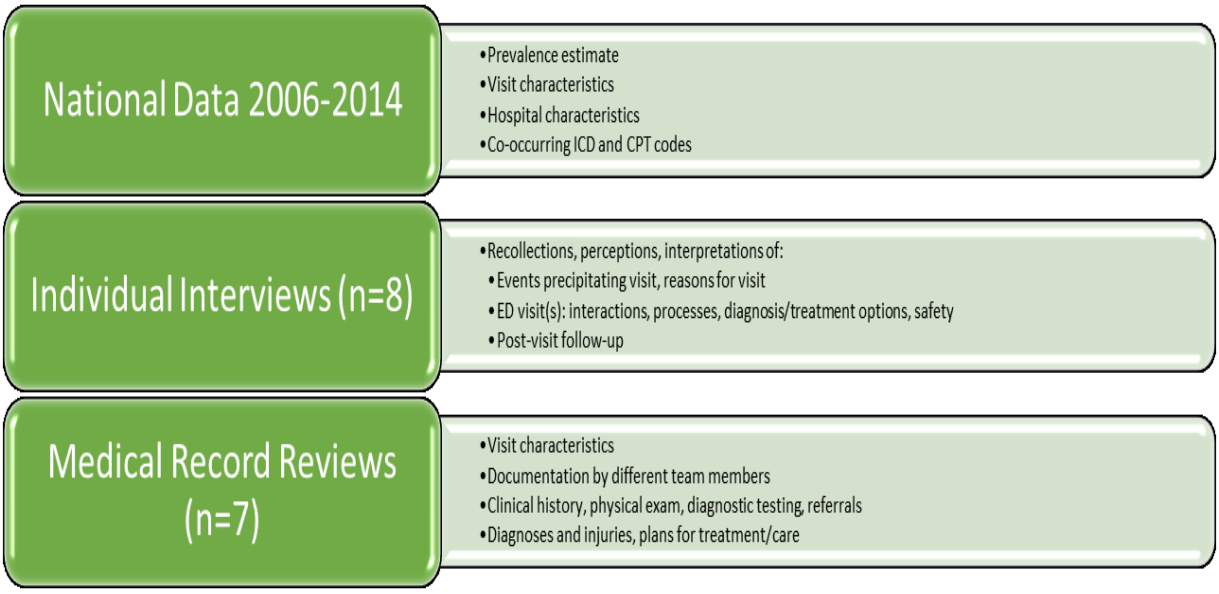
The emergency department (ED) serves as a "safety net" for vulnerable patients,[17] such as victims of intimate partner violence,[18] though little is known about ED visit prevalence or characteristics of those presenting to EDs after NF-IPS. Unlimited in scope and often unpredictable, potentially unlimited in demands, time pressured and with high variability, the ED is a complex and dynamic environment. Undifferentiated illness and injury are common for those presenting to the ED. However, the diagnostic process used to determine and explain patients' health problems, as well as guide care decisions, is a recognized area of vulnerability. The diagnostic process has been reported as one of the most common categories of adverse events in EDs.[19-21] Patients factors, system challenges, teamwork and communication failures, and clinical task issues all impact care management.[19-21] The critical necessity of partnering with patients and families in the diagnostic process, as well as true collaboration within the healthcare team, to improve health care delivery has been nationally emphasized.[22] Seeking to determine our patients' needs, perspectives and various life circumstances can also build trust and more

effective communication,[17,23] thus supporting diagnostic and treatment efforts. Further, a team approach to care, with distributed cognition across disciplines, can help to mitigate errors.[22,24] Nurses, functioning in both bedside and expanded scopes of practice, are well positioned to lead these efforts.[25-27]

Study Purpose

The purpose of this dissertation is to lay the foundation for a program of research that will provide information to support accurate, timely diagnosis for, and effective communication of risk to, women who survive strangulation by an abusive partner. Employing triangulation and integration of quantitative results with qualitative findings in a convergent design,[28] this study presents data to inform our emergency care approaches, supporting both safety and health outcomes for this vulnerable population.

Figure 1.1. Triangulation process.



Specific Aims

This mixed methods study included three specific aims:

Aim 1: Estimate prevalence and associated characteristics of visits with an ICD-9-CM code for non-fatal, non-self-inflicted strangulation among women ages 18 and older who presented to a U.S. emergency department from 2006-2014 and whose visit included an ICD-9-CM code for spousal or partner abuse.

Aim 2: Explore care-seeking behaviors, the context of the care seeking, treatment expectations, and understanding of strangulation-related diagnosis and health risks in a sample of women ages 18 and older who present to a U.S. emergency department after NF-IPS.

Aim 3: Triangulate and integrate the quantitative and qualitative data analyses from Aims 1 and 2 to provide a more comprehensive understanding of the diagnostic process for post-strangulation emergency care of women.

Conceptual Framework

This study considered NF-IPS within the National Academies of Sciences, Engineering and Medicine's conceptualization of the diagnostic process[22] (see Figure 1.2 below and enlarged version on page 26).

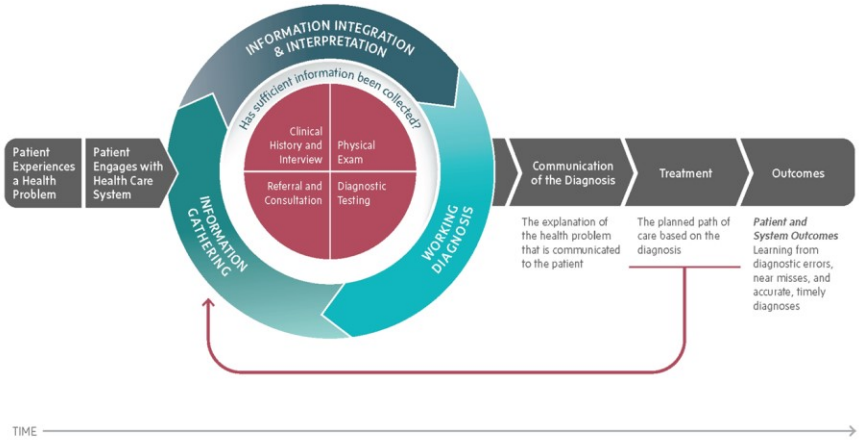


Figure 1.2. Diagnostic process (used with permission). Balogh, E. P., Miller, B. T., & Ball, J. R. (eds.). (2015). Improving diagnosis in health care. The National Academies of Sciences, Engineering, and Medicine. Washington, DC: National Academies Press.

Diagnosis is a process and means of classifying pre-existing, agreed upon categories to indicate specific conditions, which can lead to timely treatment and, ideally, positive health outcomes.[22,30] Diagnosis can serve to empower individuals, affirm patients' lived experiences, validate their symptoms, and potentially connect them to new support networks.[30] Communication of diagnoses through electronic health records and coding mechanisms like the International Classification of Diseases (ICD) can support continuity of an individual's care as well as broader epidemiologic studies of a health concern. However, diagnostic and treatment processes rely on many factors, such as the development of patient and family partnerships, systems designed to support workflows, and effective collaboration and communication of all members of the health care

team.[22,24] These factors are especially critical in identifying cases of NF-IPS when survivors may not recall details of their trauma or may be fearful of sharing information with the care team due to stigma or safety concerns.[13]

For this study, NF-IPS is operationally defined as an act that leads to significant health problems, namely physical and/or psychological injury, leading then to engagement (potentially multiple times) with the health care system through the emergency department.[22] Understanding characteristics of the women seeking care, as well as their perspectives on the gathering, integration, and interpretation of information by nurses and the care team, is critical to determining appropriate diagnoses and care plans. Communicating and discussing diagnosis, risk and treatment options with the patient is essential for positive safety and health outcomes.[22] The separate and integrative analyses of quantitative and qualitative data, gathered from national health care payer data and individual patients presenting to an ED after being strangled, provided a more comprehensive understanding of these elements to inform clinical practice, research and policy recommendations.

Significance and Innovation

The innovative use of national survey data in combination with interviews and medical record reviews to explore characteristics and experiences of strangled women can improve our collective understanding of this critical public health and safety issue. The resulting knowledge provides important considerations regarding clinical assessment, intervention and prevention efforts for this vulnerable population, as well as public policy and future research on this specific violence tactic.

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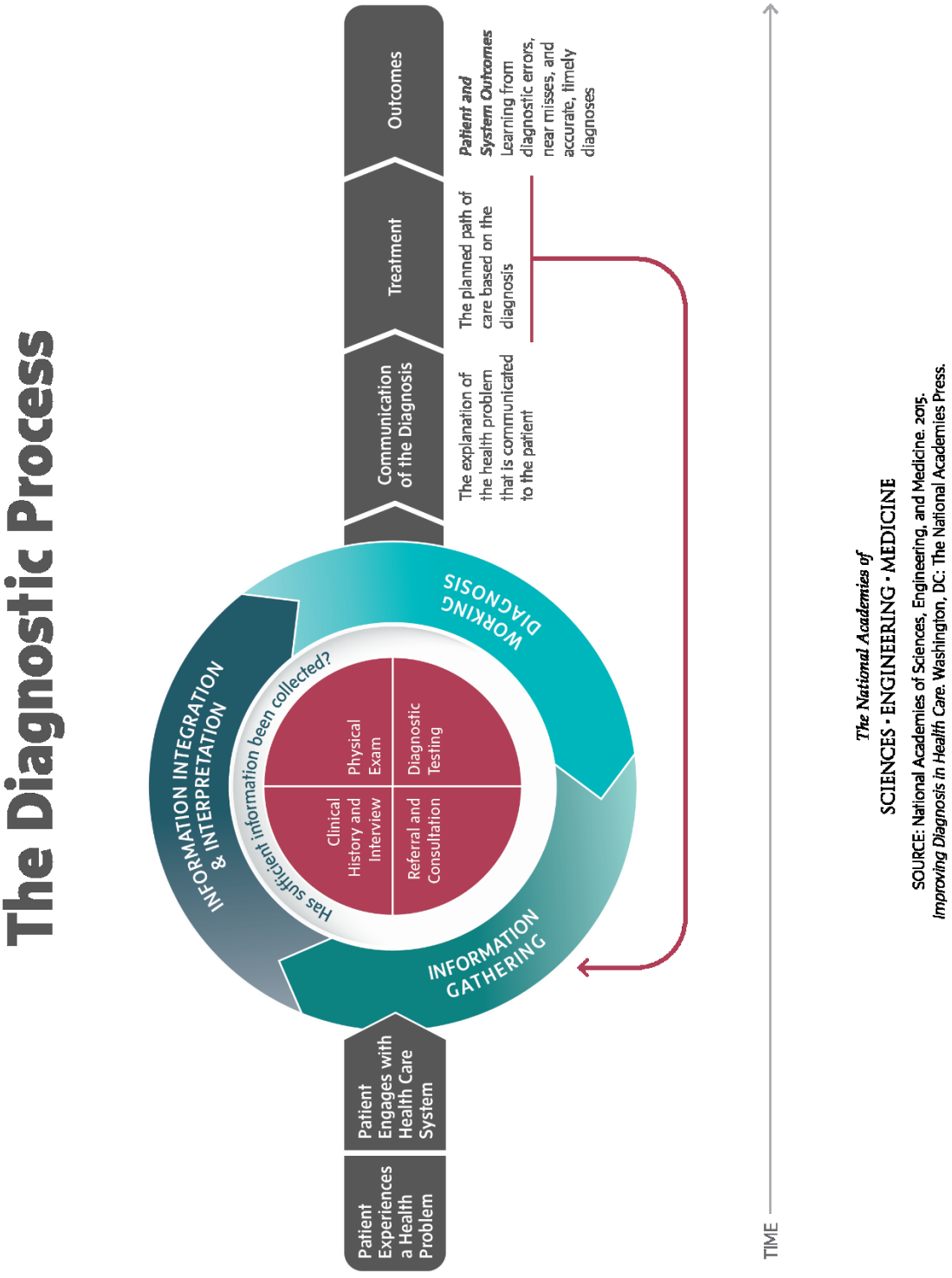

Figure 1.2. Diagnostic process (used with permission). Balogh, E. P., Miller, B. T., & Ball, J. R. (eds.). (2015). Improving diagnosis in health care. The National Academies of Sciences, Engineering, and Medicine. Washington, DC: National Academies Press.

CHAPTER 2: MANUSCRIPT ONE

Injuries of Women Surviving Intimate Partner Strangulation and Subsequent Emergency Health Care Seeking: An Integrative Evidence Review[1]

Journal: Journal of Emergency Nursing

Date of Submission: August, 2017

[1]Reprinted from Journal of Emergency Nursing. Patch MA, Anderson JC, Campbell JC. *Injuries of Women Surviving Intimate Partner Strangulation and Subsequent Emergency Health Care Seeking: An Integrative Evidence Review*, 44(4): 384-393. Copyright 2018, with permission from Elsevier (License #4534230287989)

Abstract

Introduction: Non-fatal strangulation by a current or former intimate partner is a distinct mechanism of violence with potential for severe injury or death. As non-fatal strangulation has gained recognition for its significant medical and legal implications, there have been multiple calls for nursing and other health care providers to improve practices related to strangulation screening, assessment and treatment. Given U.S. estimates suggest higher prevalence in women than men, this integrative evidence review examines existing literature related to women's injuries, and their subsequent experiences in seeking health care, after surviving intimate partner strangulation.

Methods: Following PRISMA guidelines, five electronic databases were searched, ultimately resulting in 13 articles for inclusion.

Results: Overall, non-fatal intimate partner strangulation was associated with multiple negative physical and psychological outcomes for women, though only 5-69% of strangled women sought health care, in studies reporting this finding.

Discussion: Non-probability sampling, participant self-reports, and relatively small sample sizes were frequently encountered limitations across studies. Heterogeneity of women's ages and race/ethnicities also limited comparisons. However, existing research provides a beginning framework to support practice and future inquiry.

Key words: strangulation; intimate partner; violence; women's health

Introduction

Being strangled by a current or former intimate partner is a very real threat to health and life for significant numbers of women. Strangulation, defined as external pressure to the neck closing blood vessels and/or air passages and depriving one of oxygen,[1] has been equated to the torture of drowning and water boarding.[2] Non-fatal intimate partner strangulation (NF-IPS) is increasingly being acknowledged as a serious risk factor for negative health outcomes like carotid artery dissection,[3-6] stroke,[4,5,7] seizures,[4] PTSD,[6,8] anxiety and depression,[6-9] as well as future lethal violence, heightening women's risk by 7-fold for being murdered by a partner.[10] In the most recent National Intimate Partner and Sexual Violence Survey (NISVS),[11] approximately 10% of female respondents report surviving IPS at least once in their lifetimes, extrapolating to ~11 million U.S. adult women. The estimated prevalence ratio in NISVS shows NF-IPS to be 13 times higher in women than men, suggesting an extreme gender disparity.

As NF-IPS has gained recognition for its significant medical and legal implications, there have been multiple calls for health care providers to improve practices related to strangulation screening, assessment (including diagnosis) and treatment.[12-14] At least one clinical screening tool exists to aid in identifying victims of intimate partner strangulation;[15] however, clinicians often struggle with these "walking and talking" victims[16] – patients who do not appear to meet criteria for further injury evaluation and treatment, and who are usually unaware of their true risk of either medical complications or of homicide by their partner. To inform emergency nursing practice and future research, a review of existing literature was conducted focusing on: 1) women's decisions to seek care; 2) their experiences with the health care system following NF-IPS; and 3) injuries and health consequences identified following

NF-IPS of women. This review is in contrast to others either concentrating on NF-IPS prevalence,[2] recognition and documentation,[12] or more broadly on "areas of criminology, forensic science, law and medicine"[17] related to strangulation. Understanding NF-IPS patients' expectations and experiences, along with identified health consequences, will guide research efforts to help support future patient-centered and clinically effective approaches to diagnosis, treatment, referral and community partnership decisions.

Methods

In accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement guidelines,[18] an integrative evidence review was performed of English language articles to identify reports of findings or results of intimate partner non-fatal strangulation of adult women. Five electronic databases (CINAHL, Cochrane Library, Embase, Proquest and PubMed) were searched using the terms: "spouse abuse," "domestic violence," "battered women," "intimate partner violence," "battered woman," "spousal abuse," "date rape," "neck injuries," "airway obstruction," "strangle," "strangulation," "choke," "chokes," "choked," "choking," and "throat injury." Combination searches of these terms were also completed.

During initial exploration, the search was not limited by year to aid in identification of classic works, and when none were identified, later restricted to the years 2000-2015 to provide the most current literature. Hand searches of reference lists were also completed. Published dissertations were searched for inclusion. To be included, publications also must have included both: 1) a sample of women who experienced NF-IPS, and 2) a finding related to women's subsequent decision to seek health care, interactions with the health care system, or health consequences of intimate partner strangulation. Although understood not to be categorized as

traditional research, case reports were included to help ground the discussion in real injury findings and supplement the sparse literature on this topic. Despite efforts to identify studies including only female victims of NF-IPS, the limited number of available articles necessitated inclusion of two studies that did not disaggregate mixed sex samples; each only included one male participant.[19,20] Studies were excluded if they could not be found in a full text English format. Other exclusion criteria included publications reporting non-fatal strangulation injuries of only non-intimate partners or fatal IPS.

Results

A total of 236 titles were identified on initial search and an additional 120 during hand searches of reference lists. After removing duplicates, 207 unique records remained and, after title and available abstract evaluation, 157 were removed as they did not meet either of the aims of this review, and 50 remained for full text review. An additional 37 were excluded during full text review (see Figure 2.1), with 13 meeting criteria for inclusion: 8 descriptive studies (5 quantitative,[8,9,19-21] 2 qualitative,[6,7] and 1 mixed methods[22]), as well as five case reports.[3-5,23,24]

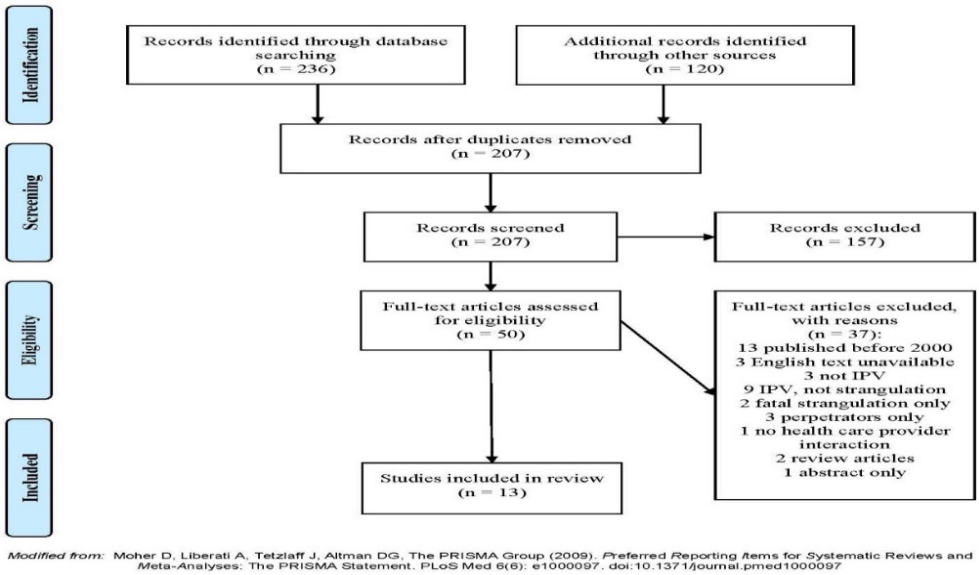

Figure 2.1. PRISMA Diagram.

Sampling and sample characteristics. Overall, convenience sampling was the most common method, and was used by six of the 13 studies.[8,9,19-22] Purposive approaches were employed by both qualitative studies.[6,7] Locations for obtaining samples included domestic violence shelters or other agencies,[6-9] police or legal settings,[21,22] and medical centers.[3-5,8,9,19,20,23,24] Sample sizes ranged from 1-4 in case reports,[3-5,23,24] quantitative from 62[9] to 300,[21] and qualitative from 13 to 17 participants.[6,7] Two of the studies explicitly included Spanish speaking participants.[8,9]

Age ranges were highly variable across studies three of which spanned early to mid-adulthood.[6,7,22] One study from a regional clinical forensic program included women into their 60s.[20] Two studies reported inclusion criteria of 18 years or older, but did not report actual ages of their final samples.[8,9] Similarly, one sample was obtained from a clinical program offering services to those 13 years and older, but no age range was provided for the sample.[19] Single case reports discussed assessments and interventions for women spanning ages 24-43.[3-5,23,24]

Some studies included racial/ethnic characteristics of the study sample, though overall ranges were very wide, and there were no discussions regarding whether the proportions of racial/ethnic groups were consistent with the general population from which the samples were taken. Proportions of Black/African American participants ranged from 16-82%; White/Caucasian from 12-69%; and Hispanic/Latina 2-46%.[6,7,9,19,20,22] However, not all authors reported this data.[3-5,8,21,23,24]

Injuries and health consequences of intimate partner strangulation. Existing literature about women seeking medical care after NF-IPS suggests it is a common form of abuse tactic with potential for severe health outcomes (see Table 2.1 in the Chapter Appendix). Manual strangulation was noted as the most common method.[9,19-21] Unaided

visualization of injuries varied, from 7% of 172 cases from a forensic nurse examiner program affiliated with an urban emergency department,[19] to 50% (n=149) in a sample of 300 cases submitted by police for prosecution,[21] to 85% of cases in a sample of 102 patients evaluated in a community setting by forensic clinicians.[20] Interestingly, in a primarily African-American sample, (n=118/172, 69%) visualization of findings suggesting potential injuries was noted in 98% of the cases after using an alternate light source,[19] whereby Shields and colleagues sample was 62% white (n=63/102),[20] suggesting injuries may be more difficult to see unaided in darker skin tones.

Multiple physical injuries were reported across studies. Commonalities, compiled in Table 2.1, included injuries to the skin/soft tissues, head/neck, and neurological, vascular and respiratory systems. In the one study reporting strangulation event counts, women who endured 2-5 strangulation events reported significantly more memory loss, tinnitus and voice changes within two weeks of the attack compared to those sustaining a single event, whereas those reporting more than five strangulations noted significantly more pain, scratches, red linear marks, sore throat, voice changes, dizziness, tinnitus, weakness, and nightmares than those with a single episode.[8]

Five case reports[3-5,23,24] described a total of 7 women reporting NF-IPS and subsequent injuries. Five of these women[3-5] were found to have significant vascular and neurological injuries such as carotid artery dissection, occlusion, thrombosis and/or stroke. In one instance,[3] the patient was discharged from the ED after a normal clinical exam but returned 2 days later with severe headache. Subsequent imaging found bilateral common carotid dissection and stenosis. Three other cases revealed delays in strangulation to symptom development (3 months-1year) and symptom development to treatment (1 day-3months).[5] Additionally, serious

acute and long-term mental health symptoms were similarly described across studies, such as anxiety and depression,[6-9,22] suicidal ideation, [7-9] PTSD, [6,8] and nightmares and insomnia.[6-9]

Deciding to seek help within the healthcare system. Present studies also suggest women are reluctant to seek health care after being strangled. The proportion of women seeking care among those in their sample was noted by 5 of the 8 non-case report studies, ranging from 5%-69%.[7-9,20,21] Strack and colleagues reported approximately 5% of their sample of 300 NF-IPS cases submitted for prosecution sought medical care within 48 hours of strangulation, and when they did, it was generally due to pain, voice changes, or difficulty breathing or swallowing.[21] Injury documentation by medical staff was noted to be considerably more robust than police reports and, thus, helpful for prosecutors.[21] Smith and team also reported low proportions of care-seeking in their sample of 101 women: 17.5% of single strangulation victims, 24.4% of those strangled 2-5 times, and 39.1% of those strangled more than 5 times.[8]

Multiple studies reported women's non-disclosure of mechanism of injury or minimization of injuries. A qualitative study of 17 women's perceptions and experiences after NF-IPS reported less than half sought health care assistance, and half of those seeking care did not disclose the mechanism of injury nor were asked, leading to participant-described misdiagnoses and inappropriate treatment plans.[7] One case study noted a patient initially reported her injuries had occurred in an accident.[23] Two other studies also reported women "lied" to medical personnel.[6,20] Minimization of injury was described by one strangled woman in a community sample. She did not seek care, stating her "…injuries weren't, like, serious…I went unconscious, [but] then I came back to consciousness."[22]

Women's experiences with health care. Those receiving care after NF-IPS gave mixed reviews, from perceptions of staff indifference to truly helpful encounters.[7] Women not seeking care reported various reasons: wanting a safe place first, not wanting to share such a personal experience, an abuser present in the room during the visit, and feelings of futility.[7] One study reported women's relative satisfaction with health care responses, but noted service interventions including medical support were time-limited and ended abruptly, leaving women feeling alone and unsupported.[22] Two studies noted women's positive perceptions of helpful health care interaction which included: being asked if they want help, assistance with safe relocation, education on strangulation-specific risk, and knowing hospitals were a place to seek help.[6,7]

Discussion

While a growing number of prevalence estimates suggest strangulation is a common phenomenon experienced by women in abusive relationships,[2,11] data regarding health care interactions are extremely sparse. Help-seeking following intimate partner strangulation varies widely, with many women never accessing health care services. This may limit the representativeness of existing knowledge of short- and long-term health consequences across this population. In most studies, identification of women who had been strangled was restricted to those who sought services (at a hospital, domestic violence program, police department, etc.) or to those reporting an incident after the fact using survey methods. While only women who obtained assistance of some type (e.g. law enforcement, health care, shelter) were included, one study reporting only 5% of women sought medical care following a single incident of strangulation[21] suggests service-seeking samples may be including more severely injured women, thus overestimating

prevalence within the entire population of abused women but also underestimating negative outcomes among those never assessed or treated. Not seeking care may be a function of underestimating potential injury or risk, fear of retaliatory violence from their intimate partner, attempting to protect an abuser, or lack of confidence in the healthcare team's ability to provide safety and help.[7]

Limitations

Identified literature was also constrained by study design. As strangulation is an emerging topic of interest among researchers studying intimate partner violence, the studies identified were primarily observational and descriptive in nature.[8,9,19-22] The retrospective nature of this data presents opportunities for recall bias[6-9,22] [6-9,22] and the degree to which traumatic experiences may have affected women's memory or interactions with health care staff was not explored. None of the studies presented health-related consequences prospectively or longitudinally.

Potential measurement biases exist due the necessary reliance on self-report of strangulation events. Joshi and colleagues noted women associated the term "strangulation" with use of a cord or other ligature around the neck, whereas "choking" was thought to mean the use of hands or arms used to apply force to the neck, [7] suggesting potential for threats to study validity, and clinical diagnosis, if behavioral definitions are not specified and explained.

Several of the studies also relied on women's self-report of physical injuries and symptoms.[6-9,22] Women did not immediately identify the risk to themselves and their health as a result of strangulation attempts, but later identified a wide range of negative health symptoms they considered related to strangulation.[7,8] Current cross-sectional literature does not clarify whether these health consequences reported by women are associated with or caused by

strangulation, and it is unclear how many of the symptoms developed immediately after the event versus at some point days or weeks later. Although repeated strangulations did increase rates of care-seeking, this may also have been because the severity, symptoms and sequelae increased with multiple episodes.

Seven included studies presented health care provider descriptions of injuries;[3-5,19,20,23,24] however, they all reported results from individual or program-based clinical assessment. The high proportion of case reports included in the review provides examples of possible presentations, clinical courses and outcomes, but are necessarily limited, and cannot be generalized to the larger population of women surviving NF-IPS. Other studies reviewed did not provide such rich descriptions, limiting our knowledge of injuries. Additionally, individual case study or small sample reports tend to be more likely to include extreme presentations with positive or negative outcomes, and are less likely to provide information on long-term NF-IPS health consequences, as the longest time reported from treatment to follow up was 20 months.[5]

Implications for Emergency Nursing Practice

While many unanswered questions regarding prevalence and associated characteristics of NF-IPS remain, emergency nursing practice implications to consider resulting from this review include:

- Patient presentations and chief complaints may vary widely. Serious injuries and death have occurred with no overt external trauma. Noting and communicating subtle findings can be critical to the ED plan of care.
- External findings may be even more challenging to identify in women of color. Innovative approaches such as ALS show promise for future improved detection.

- Women may be unaware of the risks associated with strangulation, minimize strangulation, or be fearful to share abuse information. Asking behavior-specific questions can help decrease ambiguity (e.g. pressure on the neck versus "strangled" or "choked"). Patient privacy during assessments is also critical.
- Objective, detailed documentation of reported mechanism of injury, symptoms, and assessment findings can be extremely helpful to future legal recourse for the patient. Best practice recommendations for clinicians are available.[13,25,26]
- Protocols for screening and assessment of strangulation in various care environments are emerging that can be helpful to diagnosis, care plans and referrals. Further development and testing, including leveraging information resources (e.g. electronic medical records), using ultrasound and other imaging modalities[3-5] and use of emerging technologies (e.g. ALS)[19,21] is warranted.
- Strangulation should be considered and ruled-out in younger women presenting with strokes or stroke- like symptoms.[3,5] Delayed presentations are also possible.
- Potential for brain injury and memory loss should be considered in patient assessments and care plans.[6]
- Educational programs for health care staff may be helpful, including content on strangulation risk assessment and possible minimization[7,9,20,22,23] as well as documentation best practices. These programs should be tested and barriers to the sustainability of screening tools and interventions in various practice settings identified and addressed.[8,19,21,24]

Conclusions

Much of the extant literature on NF-IPS outcomes includes case reports and descriptive studies with relatively small sample sizes. Current studies are limited in their ability to provide a broader description of who presents for care to an ED and is subsequently recognized and documented as having been strangled. Additional knowledge is needed on potential risk factors contributing to difficulties recognizing and diagnosing NF-IPS, which can significantly restrict care and ongoing support for this vulnerable population. None of the studies included in this review examined women's understanding of their diagnosis or the risk strangulation may have to their short and long-term health. Though limited, this literature provides a beginning framework for future NF-IPS inquiry to support emergency nurses and ED clinical team practice. Additionally, practice suggestions include having a low threshold for suspicion of NF-IPS, recognizing lack of external injury does not exclude serious underlying injury, and assessing for and documenting subtle, nuanced findings. Further NF-IPS research, including use of more robust study designs, sampling strategies and consistent measurement techniques, is needed to support the scientific base for screening and treatment protocols and to better understand long-term health consequences of this form of violence.

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Table 2.1: NF-IPS Reported Physical Examination Findings, Signs and Symptoms Reported in NF-IPS Literature

1st Author (Year)	Sample (n), Setting	Skin & Soft Tissue	Head & Neck	Neurological & Cardiovascular	Other Injuries & Symptoms
Case Reports					
Blereau[23] (2009)	1; hospital (ED) (United States)	ecchymosis (to neck, trunk, and extremities)	nasal bone fracture; neck ecchymosis; subconjunctival hemorrhage;	dizziness; headache; LOC;	generalized body pain; nausea
Clarot[3] (2004)	2 (one NF-IPS); hospital (France)	NR	NR	carotid artery dissection	NR
Funk[24] (2003)	1; hospital (ED, labor and delivery) (United States)	clavicle ecchymosis; facial and extremity contusions and abrasions; human bite wound and laceration to ear; neck abrasions	difficulty swallowing; eyelid drooping; hoarseness; neck pain; swelling in throat; sore throat; subconjunctival hemorrhage	headache; lightheadedness; LOC	difficulty breathing
Le Blanc-Louvry[4] 2013	3 (one NF-IPS); hospital (France)	bruising and "external marks" to neck	NR	*Acute:* Broca-like aphasia; NR carotid artery thrombosis due to dissection of ICA; facial paralysis; hand and foot dysesthesia; headache; hemiplegia of face, arm, and leg; homonymous hemianopsia; stroke *Persistent:* aphasia; apraxia; homonymous hemianopsia; seizures; spastic hemiplegia,	

Notes: DV = domestic violence; ICA= internal carotid artery; LOC = loss of consciousness; NR = not reported

Table 2.1 (Cont'd)

Malek[5] 2000	3; hospital (United States)	NR	NR	coma; dysarthria; embolic stroke; hand and arm paresis and numbness; ruptured basilar artery aneurysm; subarachnoid hemorrhage; watershed ischemic stroke	NR
Qualitative Studies					
Joshi[7] (2012)	17, DV shelter (United States)	NR	difficulty swallowing; pain, abrasions, and swelling to the neck; voice changes	LOC; stroke; tinnitus; weakness	anxiety; depression; heightened and persistent fear; insomnia; nightmares; suicidal ideation
Vella[6] (2013)	13, community-based family justice center (United States)	NR	throat pain; voice changes	ICA dissection; LOC	anxiety; depression; inability to concentrate; insomnia, learning deficits; memory loss; nightmares; PTSD; uncontrollable shaking
Mixed Methods					
Farr[22] (2002)	30 police reports (11 NF-IPS), 8 phone interviews (United States)		broken jaw; periorbital ecchymosis,	concussion; LOC	broken ribs
Quantitative Studies					
Holbrook[19] (2013)	172 (171 female, 1 male); hospital-based forensic nursing program (United States)	"intradermal injuries"	petechial hemorrhage to eyes, ears or intraorally	LOC; near LOC	

Notes: DV = domestic violence; ICA= internal carotid artery; LOC = loss of consciousness; NR = not reported

Table 2.1 (Cont'd)

Shields[20] (2010)	102 (101 females, 1 male); medical examiner's office (United States)	NR	difficulty speaking; difficulty swallowing; hoarseness; intraoral injuries; neck pain; subconjunctival hemorrhages	LOC; dizziness	difficulty breathing
Smith[8] 2001	101; hospital-based DV programs & DV shelters (United States)	edema; neck abrasions	difficulty swallowing; sore throat; voice changes	dizziness; eyelid droop; weakness; facial droop; headache; lightheadedness; loss of sensation; muscle spasms; paralysis; tinnitus; vision changes	anxiety; depression; insomnia; memory loss; nightmares; personality changes; PTSD; suicidal ideation
Strack[21] 2001	300; prosecutors' office (United States)	bruising behind ears; ear pain; petechial hemorrhage to the neck or eyes; redness, cuts, abrasions and bruising to neck	difficulty swallowing; hoarseness; sore throat; subconjunctival hemorrhage; voice changes	anisocoria; headaches; LOC; lightheadedness; near LOC	breathing changes; cough; difficulty moving neck; difficulty walking; fecal incontinence; hyperventilation; memory loss; nausea; pain (not specified); uncontrollable shaking; vomiting
Wilbur[9] 2001	62; hospital-based DV programs & DV shelters (United States)	neck abrasions; petechial hemorrhage; rope or cord burns	dysphagia; neck pain; neck swelling; nose bleed; sore throat; voice change	dizziness; eye droop; facial droop; LOC; numbness; paralysis; tinnitus; unilateral weakness; vision changes	acid reflux; anxiety; depression; difficulty breathing; insomnia; memory problems; miscarriage; nightmares; suicidal ideation; urinary incontinence

Notes: DV = domestic violence; ICA= internal carotid artery; LOC = loss of consciousness; NR = not reported

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CHAPTER 2: ADDENDUM

The search strategy previously defined in Chapter 2 was repeated to determine if any additional studies had emerged in the literature since our review was published. Criteria included English-language articles with both a sample of women who experienced non-fatal intimate partner strangulation (NF-IPS) and a finding related to their subsequent decisions to seek health care, interactions with the health care system, or health consequences of intimate partner strangulation.

Findings

Seven descriptive studies[1-7] meeting criteria were identified and are summarized below.

Sampling and Sample Characteristics

As found in our previous review, convenience sampling was common and sample demographics varied between studies. Prevalence of strangulation ranged from 23% in overall visits to a sexual assault/domestic violence forensic nurse examiner program[4] to 79.7% in a sample of women with police response to an intimate partner violence (IPV) event.[5]

Campbell (AM) and study team[1] reviewed over 9,000 IPV incidents with law enforcement response. Victims were female in 88% of cases, and 88% of suspects were male, and 87% involved a male suspect and female victim. A small number of events included same-sex couples (3%). They reported a disproportionately higher percentage of their sample was African American, 51% versus 46% White, compared to the county's overall population (not tested for significance), although strangulation was not reported by race. Of those reporting yes or no, 29% (2605/8919) of IPV victims

reported strangulation during the incident (32% among female IPV victims). Prior strangulation by the suspect was endorsed by 84% of NF-IPS victims, and 31% of pregnant IPV victims reported strangulation during the most recent event, suggesting pregnancy may be neither a specific risk factor nor protective.

Campbell (JC) and colleagues'[2] sample included 901 women of African descent from a large U.S. city and the U.S Virgin Islands. Ages ranged from 18-55 (median = 27, IQR: 22-35), with no significant difference between IPV cases and non-IPV controls. A 36% prevalence of past NF-IPS was found among the 537 cases of women with abuse histories.

George et al.[3] retrospectively reviewed electronic medical records from January 2015 to October 2016 of 185 patients referred to an IPV support program from the ED. They age- and sex-matched a control group (n=555) who had also presented to the ED, providing a 1:3 ratio of IPV victims to control. Any imaging within five years of the index ED visit was also reviewed. Overall sample demographics reported were a mean age of 34.2 (12.2 SD), 96.2% were female (178/185), and majority African American (69/185, 37.3%). A history of NF-IPS was reported by 49/185 or 26.5%.

McQuown and colleagues[4] conducted a retrospective record review of all visits to a health system sexual assault (SA)/domestic violence (DV) forensic nurse examiner (FNE) program over a five-year period (N=1596). Ages ranged from 13-98 (mean=30), of which 97% were women. The sample was primarily White (69%), with 29% African-American. In 46% of visits, the perpetrator of the assault was an intimate partner, though more commonly in DV versus SA (84% compared to 16%, $p < 0.001$). Approximately half of those evaluated by the FNE program were previously assessed in the ED (56%,

197/351, 95% CI: 51-61%). Less than half of visits were evaluated by the FNE within 12 hours of injury (43%, 148/351, 95% CI: 37%-38%), and 16% were seen more than 72-hours post-assault (58/351, 95% CI 13-21%). Prevalence of strangulation in the total sample was 23% of cases, though more often found in DV (38%) as opposed to SA (12%, $p < 0.001$). Multiple strangulations during an event were reported in 36% of visits (125/351, 95% CI: 31%-41%). Manual strangulation was the most commonly reported method (93%, 327/351, 95% CI: 90-96%).

Messing and team[5] analyzed a sample of 1,008 women referred by police after an IPV incident, finding NF-IPS prevalence (either attempted, completed or multiple) of 79.7% (803/1008). Mean age of the sample was 32.32 (SD 9.84). Women's race/ethnicity was reported as White (36.71%), African American (31.65%), Native American (13.19%), Latina (9.03%), multiracial (3.08%) and other (6.35%). African American women were noted to have a higher risk of all three types of strangulation compared to White women, though small cell counts between ethnic groups may have limited further detection of differences.

In a secondary data analysis of a randomized control trial to develop and test an HIV-IPV prevention intervention, Mittal and team[6] explored depressive symptoms in a sample of 175 heterosexual women reporting IPV and recruited from the family court, healthcare organizations or the Department of Health and Human Services. Inclusion criteria restricted ages to 18-49, mean overall sample age was 35.98 years (SD 10.72), and those reporting NF-IPS were younger (mean 34.85 years, SD 10.72) compared to those without strangulation (mean 37.03, SD 10.33). Participants' race/ethnicity included White (44%, n=76), African American (41, n=71), and other (16% n=28).

NF-IPS prevalence was 59% (103/175). The only variable associated with strangulation was education, with higher education levels less likely to report NF-IPS.

A cross-sectional study by Zilkens[7] and team reviewed sexual assault (SA) resource center visits spanning six years by females ages 13 and older in Australia. Non-fatal strangulation was found in 7.4% of their SA cases (79/1064) and more commonly inflicted by an intimate partner (46/79 or 58.2%, $p < 0.001$). Higher relative odds for non-fatal strangulation were reported in ages 30-39 (OF 5.8, 95% CI: 2.7, 12.2) and by an intimate partner (OR 8.4, 95% CI: 4.8, 14.6). Manual strangulation or chokehold was reported in 75 cases (94.9%), with the remaining being ligature (n=3) or both manual and ligature (n=1). Though not collected for all years nor further investigated due to low numbers, 2/39 women surviving strangulation were pregnant at the time of the event compared to 3/398 without strangulation.

Injuries and Health Consequences of Intimate Partner Strangulation

Women experienced various symptoms and injuries from strangulation assaults by partners. Visibility of injuries was reported in two studies, ranging from 50% in a sample evaluated by forensic medical physicians[7] to 60% in police-identified cases.[1]

Campbell (AM)[1] reported 60% of those alleging strangulation had injuries visible to responding officers and were documented. Examples included swelling subconjunctival hemorrhage, abrasions and bruising. Of those reporting NF-IPS, only 14% agreed to receive medical treatment (3% first aid on the scene and 11% transported to the hospital); 17% of pregnant women received medical treatment after the NF-IPS incident. Specific injuries were not reported.

Campbell (JC)[2] and colleagues reported that probable TBI, defined as lifetime strangulation or past-year head injury, was associated with an overall increase of 3-4 points in women's central nervous system (CNS) symptom frequency score (β: 3.76, 95% CI: 3.07, 4.45; $p < 0.001$).

George and colleagues'[3] review of imaging studies after IPV ED visits did not identify definite strangulation-specific injuries, though there were 2/185 IPV cases noted with vascular injury (thrombosis, dissection). Of note, this review identified that those in the IPV group had more imaging studies in the previous five years than non-IPV patients, with a median of four studies versus one, raising additional concerns about the amount of radiation exposure these women must endure over time.

Of the 23% (351/1542) reporting NF-IPS by McQuown,[4] signs and symptoms included: injury to the neck (57%, 198/351, 51-62%), breathing difficulty (47%, 165/351, 42-53%), loss of voice or voice change (40%, 139/351, 35-45%), pain with swallowing (31%, 107/351, 26-36%), persistent throat pain (31%, 107/351, 26-36%), difficulty swallowing (27%, 95/351, 23-32%), loss of memory (10%, 35/351, 7-14%), and involuntary urination/defecation (8%, 27/351, 5-11%). Visible injuries were reported in 69% (185/296, 95% CI: 63%, 74%) and loss of consciousness in 25% (67/296, 95% CI: 20%-31%).

Messing's group[5] found women reporting a loss of consciousness (LOC) greater than one hour attributed to strangulation were more likely to have sustained multiple strangulations (AOR 2.90, 95% CI: 1.96, 4.30) and to seek medical care for IPV (AOR 2.19, 95% CI: 1.48, 3.24) than those not reporting LOC. Those reporting multiple strangulations were more likely to report having suffered a miscarriage from abuse (ARR

2.95, 95% CI: 1.06, 8.23) and/or a head injury-related LOC for greater than one hour (ARR 5.08, 95% CI: 1.06, 24.3).

Mittal and team[6] reported that strangulation was not found to increase the odds of depressive symptoms (OR 1.802, 95% CI: 0.819, 3.966) after accounting for IPV experiences in a multivariable logistic regression model, though the authors acknowledge the sample size may have been too small to detect significant differences.

Zilkens[7] and team noted common NF-IPS symptoms were neck/throat pain (46.8%), neck tender to palpation (34.2%), pain and/or difficulty swallowing (19%), and vocal changes (15.2%). Signs included linear neck abrasions (31.7%), petechial bruising of the upper neck/face (21.5%) and non-petechial bruising to the neck (17.7%). They also found less common but concerning issues such as shortness of breath (8.9%), LOC (8.9%), felt dizzy/faint (8.9%), blurred vision (2.5%), urinary incontinence (1.3%), pain on talking (1.3%); subconjunctival hemorrhage (3.8%), conjunctival petechiae (2.5) and soft tissue swelling of the neck (1.3%). They also identified that no external physical findings were present in half of the NF-IPS cases, and almost a quarter had neither signs nor symptoms.

Deciding to Seek Help within the Health Care System

Two studies[1,5] noted results specifically related to care seeking, echoing previous research finding low rates by women after NF-IPS, and those that do present for treatment may reflect an increasing severity of violence.

Campbell (AM)[1] found that only 14% of NF-IPS victims received either on-scene medical treatment or transport to a hospital. Though victims were frequently offered medical care, they often declined. Although recruiting from non-ED, non-acute care

medical clinics (primary care, prenatal, family planning), the women in Campbell (JC) and colleagues' study were not specifically seeking care for a violence-related issue.

Messing et al.[5] noted women reporting a loss of consciousness attributed to strangulation were more likely to have been strangled multiple times (AOR 2.90, 95% CI: 1.96-4.30) and more likely to seek IPV-related medical care (AOR 2.19, 95% CI: 1.48, 3.24) as compared to women strangled but not reporting LOC. Care seeking increased with strangulation frequency, with 8.78% of abused women but not strangled, 13.56% of women experiencing attempted strangulation, 21.38% of those surviving a completed strangulation and 29.92% of multiple strangulation survivors reporting a subsequent medical visit for IPV.

Conclusion

Though none of the articles explicitly discussed women's health care experiences, this more current literature remains consistent with our previous review finding strangulation more prevalent in younger age groups, variable but similar demographics and injuries, and low rates of care-seeking among women surviving intimate partner strangulation.

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CHAPTER 3: MANUSCRIPT TWO

U.S. Emergency Department Visits by Adult Women for Non-Fatal Strangulation, 2006-2014: Prevalence and Associated Characteristics

Formatted for submission to the Journal of Emergency Nursing (funding source) (submission pending)

Abstract

Introduction: Non-fatal strangulation by an intimate partner (NF-IPS) poses significant acute and long-term health threats and heightens women's risk for future femicide. Lifetime prevalence of NF-IPS has been estimated in the general U.S. population to be approximately 10% or 11 million women. Given the potential for significant health risks and serious consequences of strangulation, this study estimates the prevalence and describes associated characteristics of strangulation-coded visits among U.S. emergency department visits by women for intimate partner violence (IPV).

Methods: Prevalence estimation, simple and multivariable logistic regression analyses were completed using data from the AHRQ HCUP Nationwide Emergency Department Sample (NEDS) spanning years 2006-2014.

Results: Prevalence of strangulation codes was estimated at 1.2% or 121/10,000 IPV visits. Adjusting for visit and hospital characteristics and visit year, lower odds of strangulation-coded visits were noted in older age groups and non-metropolitan hospitals, and increased odds from higher income ZIP-codes, Level I/II trauma centers, and non-Northeast regions. Increases in strangulation codes among IPV-related visits in recent years were also observed.

Discussion: This study adds to the limited literature on NF-IPS by exploring nine years of national ED coding trends. A lower than expected prevalence may reflect an underestimate of true NF-IPS visit prevalence or a very low rate of ED care-seeking for this vulnerable population. Higher odds of strangulation codes among IPV visits by women in more recent years may be due to increased recognition and documentation by

front-line clinicians and coding teams. Continued research is needed to inform clinical care and policy efforts further.

Contribution to Emergency Nursing Practice

- The current state of scientific knowledge on non-fatal intimate partner strangulation of women indicates it is understudied as a unique mechanism of violence against women.
- The main finding of this research is that the prevalence of strangulation codes among ED IPV visits by women was estimated at 1.2% or 121/10,000 IPV visits. Statistically higher odds of strangulation coding were observed in visits from younger women, metropolitan hospitals, Level I/II trauma centers and non-Northeast regions.

A key implication for emergency nursing practice from this research is that recognition of strangulation in women visiting the emergency department is critical to both their immediate and long-term health. Emergency nurses on the front lines of care are well positioned to lead post-strangulation identification and treatment efforts.

Key words: strangulation; intimate partner; violence; women's health, prevalence

Introduction

Non-fatal strangulation by an intimate partner (NF-IPS) poses significant acute and long-term health threats[1] and heightens women's risk for future femicide.[2,3] Defined as external pressure to the neck that occludes air passages and/or blood vessels, strangulation can dangerously limit oxygenation and result in injuries to physical structures, [4-7] psychological terror,[8,9] brain trauma[10-12], and possibly death.[13,14] Lifetime prevalence of this specific method of violence has been estimated in the general U.S. population to be approximately 10%, or 11 million women.[15] Data further suggests that strangulation is a gendered phenomenon in the U.S.,[15,16] with significantly more women reporting it than men. Furthermore, strangulation is higher in subpopulations of women, such as those enduring intimate partner violence and those presenting to domestic violence shelters.[1,15,17]

Although extant literature on NF-IPS is limited albeit growing, the proportion of women seeking post-strangulation emergency care has been estimated to range from 5% (sample of 300 women whose cases were submitted for prosecution)[18] to 69% (sample of 102 presenting for clinical forensic evaluation).[19] This care seeking may be influenced by specific symptoms, such as pain, voice changes, or difficulty breathing or swallowing.[18,19] Previous investigations of emergency department (ED) visits for intimate partner violence exist, but specific study of women presenting post-strangulation is lacking. Given the potential for significant health risks and serious consequences of strangulation, there is an urgent need to better understand these visits to support emergency clinicians' response to this vulnerable and high-risk population. Examining ED-specific national, multi-year data can contribute important insights to inform practice

protocols and policy efforts. Thus, the aim of this descriptive study is to estimate the prevalence and categorize associated characteristics of U.S. ED visits by women with diagnosis and external cause of injury codes for an intimate partner violence (IPV) event that included strangulation.

Methods

A cross-sectional analysis of the Nationwide Emergency Department Sample (NEDS) data was conducted, accessed from the Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP).[20] NEDS, the United States' largest publicly available all-payer ED database, is a stratified single-stage cluster probability sample of hospital-based emergency departments.[20] Stratified by geographic region, location (urban/rural), teaching status, ownership and trauma-level designation, NEDS documents approximately 20% of community, non-rehabilitation hospital-based U.S. ED visits and provides sample weights allowing for regional and nationwide estimates from approximately 25-31 million visits/year (120-138 million ED visits/year weighted).[20] Its large sample size allows data analysis across various hospital types and for relatively uncommon conditions.[20] Providing de-identified information, this database has been used by other researchers to estimate ED visit prevalence for various illnesses and injuries, including mechanisms such as IPV[21,22] and other abuse.[23,24]

The NEDS data was accessed through the Johns Hopkins Surgery Center for Outcomes Research and imported to statistical analysis software using the publicly-available NEDS Stata Load Programs. This study was reviewed and acknowledged by the Johns Hopkins Medicine Institutional Review Board as exempt/not human subjects research (JHMIRB 00148154).

Inclusion and Exclusion Criteria

Visits by female patients ages 18 and older to a U.S. emergency department during the years 2006-2014 with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code for intimate partner violence (IPV), specifically E967.3 ("battering by spouse or partner"),[21,22] were included. As this study focused on non-fatal strangulation cases that were not self-inflicted, visits in which the patient died (either in the ED or during the associated inpatient admission) or that included a concurrent ICD-9-CM external cause of injury code for "Suicide and Self-Inflicted Injury" (E950-E959), were excluded from this analysis.

Variables

The dependent variable, non-fatal strangulation, was defined using the following ICD-9-CM diagnostic and external cause of injury codes: 994.7 ("asphyxiation and strangulation"), E963 ("assault by hanging and strangulation"), E983.8 ("strangulation or suffocation by other specified means undetermined whether accidentally or purposely inflicted"), and E983.9 ("strangulation or suffocation by unspecified means undetermined whether accidentally or purposely inflicted").

Independent variables are shown in Table 3.1, including visit and hospital characteristics, HCUP Clinical Classification Software (CCS) categories and visit year.

Table 3.1: *Independent Variables Included in the Study*

Visit Characteristics	Age/age categories, national quartile of median household income for patient's zip code, admission/discharge status, expected primary payment source
Hospital Characteristics	Hospital region, trauma center indicator, urban-rural location, teaching status

HCUP Clinical Classification Software (CCS) Categories	ICD-9-CM diagnosis and procedure codes categorized into smaller, clinically meaningful categories within HCUP databases for descriptive statistical analyses
Visit Year	2006-2014

For this analysis, the following variables were maintained in their original NEDS categories: income quartile for patient's ZIP code,[22] hospital region (Northeast, Midwest, West, South),[22,24] and hospital teaching status (metropolitan teaching, metropolitan non-teaching, non-metropolitan).[24] Other variables were modified as follows.

- Based on other IPV literature, ages were combined into four categories (18-24, 25-34, 35-44, 45 and over),[22] and ED disposition collapsed into two categories, treated/released or admitted.[15]
- The expected primary payer categories of "no charge" and "other" values were collapsed into a single category "no charge/other," to increase statistical power.
- Trauma centers were collapsed into Level I/II (includes Level I, Level II, and hospitals collapsed I/II for stratum with < 2 trauma hospitals) and Level III/Non-Trauma (includes Level III, Non-Trauma, and hospitals collapsed into Non-Trauma/Level III category starting in 2011 NEDS). Additionally, 3% of visits in this analysis fell into another category, "Trauma Center Level I, II, or III, collapsed category in the 2006-2010 NEDS," and were subsequently combined into the Level I/II category.
- Urban/rural hospital location was combined from 9 categories in NEDS into 3: "Metropolitan" (large metropolitan areas with at least 1 million residents, small metropolitan areas with less than 1 million residents, and metropolitan collapsed

category of large and small metropolitan), "Non-metropolitan" (micropolitan, not metropolitan or micropolitan (non-urban residual), and non-metropolitan collapsed category of micropolitan and non-urban),[22] and "Collapsed NOS" (collapsed category for any urban-rural location in NEDS 2014 and collapsed category of small metro and micropolitan in NEDS beginning in 2011).

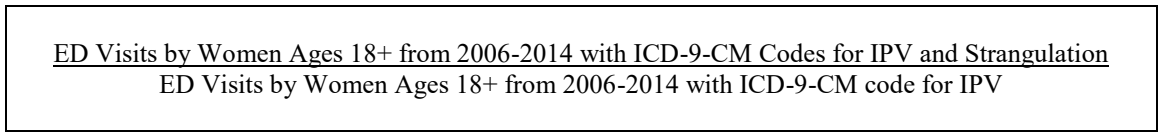
Power Analysis

Statistical power analysis was conducted *a priori* using NCSS PASS v.14 (NCSS LLC, Kaysville, Utah) to determine detectable odds ratios given an expected sample size of 26,284 IPV visits by women per year,[22] or 236,554 visits over the nine-year period. With this large sample size, and in anticipation of several statistical analyses, a conservative alpha level of .01 and a beta level of .80 were set. Based on existing literature estimates, the proportion of strangulation visits was varied from 0.05[18] to 0.35.[25] Since the distributions of the independent variables are unknown, the prevalence of each predictor variable was varied from 10% to 30%. When the prevalence of the predictor variables is 30%, very small odds ratios ranging from 1.03 (when NF-IPS visit proportion is 0.35) to 1.07 (when NF-IPS visit proportion is 0.05) can be detected. As the prevalence of the predictor variable decreases, the odds ratios detectable increase; 1.04–1.08 at 20% prevalence and 1.05 -1.11 at 10% prevalence.

Statistical Analysis

Statistical analysis was completed using Stata 14.2 SE.[26] To account for the complex survey design of the NEDS dataset, appropriate discharge-level survey weights provided by HCUP were used in all analyses. Prevalence was determined using the calculation in Figure 3.1.

Figure 3.1: Prevalence Calculation for Strangulation-Coded Visits among U.S. ED Visits by Women Ages 18+ Between 2006-2014 Coded for IPV



Independent variables were summarized using means and 99% confidence intervals (continuous, i.e. age, two-sample t-test) or by frequency distributions and percentages (binary or categorical, Pearson's Chi-squared test). Four logistic regression models were constructed and progressively adjusted for visit and hospital characteristics and year. Table 3.4, Model 1 (see Appendix) reflects bivariate logistic regression, while Model 2 concurrently adjusts for age category, income quartile for patient ZIP-code, ED disposition status and expected primary payer. Model 3 further adjusts for trauma center status, hospital urban/rural classification, and hospital region in addition to covariates adjusted in Model 2. Model 4 additionally adjusts Model 3 for visit year. Hospital teaching status was found to be collinear with hospital urban/rural status and subsequently removed from the logistic regression models. For all statistical tests, a p-value of less than 0.01 was considered significant to account for multiple comparisons.

The original dataset of IPV-coded ED encounters spanning 2006-2014 included 56,684 visits. In reviewing outliers, one visit in the IPV-without-strangulation group had an age of 111 and was removed from the analysis. Once further inclusion and exclusion criteria were applied, the final analytic dataset consisted of 49,675 visits. No variables had missing values in the final analytic dataset except for patient ZIP-code income quartiles, which had a very small percent missing (1413/49073 or 2.88% for IPV-only

visits and 12/601 or 1.99% of strangulation-coded visits). Given the distribution of missing observations in both non-strangulation and strangulation-coded visit groups, similar key characteristics in both groups was assumed and imputation was not performed.

Results

Visit characteristics are presented in Table 3.2 (see Appendix). Prevalence of visits with co-occurring strangulation codes among those with IPV codes was estimated at 1.2% (99% CI: 1.00%, 1.47%), or 121 strangulation visits per 10,000 IPV visits. Strangulation-coded visits reflected younger mean ages than those without strangulation codes [32.94% (99% CI: 31.82%, 34.06%) versus 35.37% (99% CI: 35.14%, 35.61%)], and a higher percentage of strangulation-coded visits in younger age groups (18-24 and 25-34). IPV visits with strangulation codes were significantly more likely to be reported by hospitals in the Midwest and Western regions of the U.S., Level I/II trauma centers, and metropolitan hospitals with teaching roles compared to IPV visits without strangulation codes. When examining the annual distribution of total IPV visits coded over the total nine years of NEDS data studied, year-to-year percentages were found to be relatively stable, ranging from 9.82% (2013) to 12.06% (in 2010). However, a nearly three-fold increase in the strangulation-coded visit distribution was observed in 2014 (20.63% of the total 9 years of visits) as compared to 2006 (7.08%). A significant difference was not detected in the percentage of strangulation-coded visits by patients' ZIP-code-specific income quartile, ED disposition, or health insurance/payer information.

The top five principal CCS categories are presented in Table 3.3 (see Appendix). Significantly higher percentages of strangulation-coded visits as compared to visits with

IPV alone were observed in categories 244, "Other Injuries and Conditions Due To External Causes" (52.79% versus 24.38%, $p < 0.01$) and 205, "Spondylosis, Intervertebral Disc Disorders, Other Back Problems" (3.26% versus 1.67%, $p < 0.01$). Strangulation-coded visits were less likely to have a principal CCS category of 239, "Superficial Injury, Contusion," compared to IPV-only visits (19.37% versus 31.98%, $p < 0.01$); however, this was still the second most common category found for strangulation visits. Although not significantly different from IPV-only visits ($p = 0.409$), the fourth most common category for strangulation-coded visits was 181, "Other Complications of Pregnancy" (4.14% (99% CI: 2.37-7.16).

In the unadjusted logistic regression (Table 3.4, Model 1), visits from older age groups had lower odds (35-44 years OR=0.68, 99% CI: 0.49-0.95; 45 years+ OR = 0.55, 99% CI: 0.39-0.78) of demonstrating strangulation coding as previously defined compared to IPV visits by those 18-24 years old. Compared to visits from the lowest quartile (least income) of patient ZIP-code-specific income, those from the third quartile had increased odds of strangulation coding (OR = 1.41, 99% CI: 0.96-2.08), though not considered statistically significant given a conservative alpha of 0.01 ($p = 0.02$). Non-metropolitan hospitals were 55% less likely to have non-fatal strangulation coding compared to metropolitan hospitals (OR = 0.45, 99% CI: 0.27-0.75). Compared to Level III and non-trauma centers, visits from Level I/II/collapsed trauma centers had 76% increased odds of concurrent strangulation coding (OR =1.76, 99% CI: 1.15-2.69). Visits from the Midwest and West had significantly higher odds of strangulation codes (Midwest OR = 2.79, 99% CI: 1.52-5.14; West OR = 2.25, 99% CI: 1.34-3.77) compared to visits from Northeast hospitals. An increasing time trend was also observed comparing

visits from 2006 with those from recent years, demonstrating higher odds of concurrent strangulation coding (2012: OR = 2.34, 99% CI: 1.18-4.64; 2013: OR = 2.01, 99% CI: 1.01-3.98; 2014: OR =3.37, 99% CI: 1.72-6.59).

Different levels of adjustment did not significantly alter the direction of associations found in the simple logistic regression analysis. In the fully adjusted model (Table 3.4, Model 4), older age groups (age 35-44: OR = 0.69, 99% CI: 0.49-0.96; age 45+: OR= 0.49, 99% CI: 0.33-0.73) and non-metropolitan hospitals (OR = 0.59, 99% CI: 0.35-0.97) were associated with lower odds of co-occurring strangulation codes than those in the 18-24 age group or metropolitan hospitals, respectively. Characteristics significantly associated with higher odds of a concurrent strangulation code compared with references in Model 4 included visits from the third quartile (OR 1.51, 99% CI: 1.04-2.20) and fourth quartile (OR 1.55, 99% CI: 1.01-2.39) of patient ZIP-code-specific income level, Level I/II/collapsed trauma center (OR = 1.64, 99% CI: 1.10-2.46), hospitals from non-Northeast regions (Midwest: OR = 3.01, 99% CI: 1.67-5.43; South: OR = 1.92, 99% CI: 1.11-3.32; and West: OR = 2.42, 99% CI: 1.47-4.01), and visits from years 2012 (OR = 2.29, 99% CI: 1.17-4.48), and 2014 (OR = 3.21, 99% CI: 1.68-6.13). Year 2013 also demonstrated an increase from 2006, though not reaching the *a priori* threshold of $p < 0.01$ (1.97, 99% CI: 1.00, 3.88, $p = 0.10$).

Discussion

Intimate partner strangulation is understudied as a unique mechanism of violence against women. With cumulative and more recent data, this study contributes to the science on NF-IPS by providing additional details on prevalence and characteristics of ED visits by women after being strangled by an intimate partner.

Finding a relatively low percentage of visits coded for strangulation (1.2%) among U.S. ED IPV-coded visits of women from 2006-2014 suggests that strangulation is an underreported event. Although existing literature reports care-seeking among female IPV survivors as low as 5%, it is possible some were limited to EMS response not resulting in an ED visit. It is also possible women presented to an ED but did not report the strangulation.[28] Though further investigation is needed, lack of applied strangulation codes may be influenced by women's reluctance to share or loss of memory from physical and psychological trauma, challenges in recognizing strangulation by the ED team, documentation shortfalls influencing subsequent coding/billing, and/or practice variations of coders or billing teams. If this prevalence finding underestimates true ED visit frequency of women after NF-IPS, it becomes challenging to quantify the need for appropriate resource prioritization supporting strangulation-specific injury prevention and reduction efforts. Aligning incentives to encourage appropriate strangulation coding, such as improved reimbursement, could strengthen confidence in these estimates.[29]

To maximize identification specificity, this study defined IPV-related visits using ICD-9-CM code E967.3 ("battering by spouse or partner"), as found in other NEDS-based IPV studies.[21,22] This code captures IPV-specific visits and filters out other abuse-related visit codes included in other studies.[27] Davidov and colleagues[22] estimated closer to 26,284 IPV-related visits by women per year, which is consistent in general but slightly greater than the estimate of 25,081 IPV-related visits per year found in this study. The difference may be explained by the decreasing trend of IPV-coded ED visits observed after 2011 (see Table 3.2).

An increasing trend of co-occurring IPV/strangulation-coded visits within the study period from 2006-2014 was observed. Given that total IPV-related visits for women were relatively stable from year-to-year, this increase was not likely due to greater visit volume. Coordinated efforts and leadership via many organizations, such as the national Training Institute on Strangulation Prevention launched in 2011, are driving improvements in strangulation-specific legal penalties and multidisciplinary training for health care, law enforcement and advocacy staff. These temporal changes may be influencing this increased trend through heightened strangulation recognition by ED clinicians, availability of ED staff trained in forensic assessment including strangulation, more accurate ICD code assignment due to improved documentation, and increasing public awareness of strangulation as a high-risk form of violence. It is also possible that the findings reflect increasing violence by strangulation. However, the exact role played by the above factors cannot be specifically assessed without additional data. More research is needed to explore characteristics influencing strangulation reporting in ED visits by women surviving IPV.

Though limited, existing literature suggests it may be more difficult to identify bruising in darker skin tones.[1] The ability to visualize a bruise on the outer layers of skin can vary depending on several additional factors both inherent to the assaulted individual (e.g. thinning skin, coagulability) and mechanisms associated with the assault (e.g. pressure and force exerted, body surface area affected). Superficial bruising may be seen earlier compared to deeper bruises, which can take hours to days to appear.[30] Fatal and near-fatal strangulation injuries without any overt external findings have also been reported.[13] Without this "clue" to guide clinicians, and in the absence of other supporting

evidence, strangulation could inadvertently be missed. Further study of emerging technologies to enhance latent injury identification, such as ALS, could prove helpful.[31,32]

Other findings also highlight the need for continued research regarding NF-IPS. It was observed that visits made by women of younger age groups, from non-Northeast hospitals, and from Level I/II trauma centers had a higher percentage of strangulation codes. The IPV-related ED visits in the study sample had a mean age of 35.4 years, consistent with previous studies focused on ED visits coded for IPV but not specific to strangulation.[22,27] Also, like findings in female IPV populations with a majority reporting strangulation,[18,33] strangulation-coded visits' mean age was 32.9 years. This study also replicates the age difference patterns seen in Glass and colleague's study between women with and without strangulation across three abuse groups.[2] These observations suggest a possible increased strangulation risk in younger women experiencing IPV, or potentially a decreased suspicion and recognition in older age groups, necessitating additional study.

Both income quartiles 3 and 4 (highest income) had higher odds of having a concurrent strangulation code compared to quartile 1 in the fully adjusted model, and approached significance in both the unadjusted model and models adjusting for visit variables (Model 2) and visit and hospital variables (Model 3) . Unfortunately, dataset limitations precluded further sociodemographic examination of these results, but further analysis of these results should be conducted with other datasets. Strangulation-coded visits were more frequently reported from a trauma center, which may receive more severely injured patients, possibly increasing the likelihood of recognition and documentation of this unique mechanism, leading to improved code application. Although not statistically significantly different from IPV-only coded visits, those with

strangulation codes had “Other Complications of Pregnancy” as the fourth most commonly assigned principal CCS category. As multiple strangulation has been reported to be associated with higher risk of miscarriage (ARR 5.08, $p < 0.05$) compared to no strangulation among female survivors of IPV,[33] this would be important to examine in future investigations and to advocate for strong legislation against strangulation that includes maternal-fetal health language. Further study via national- and state-level datasets is also warranted using broader, more inclusive criteria for defining NF-IPS codes.

Limitations

This study has several limitations due to the inherent design of the NEDS dataset. The observation/unit of analysis in NEDS is defined by individual ED discharge records of visits not unique patients. Thus, if a patient visits the ED more than once per survey year, each visit would be considered a separate observation of an ED visit. Due to de-identification of the dataset, we were unable to determine if multiple visits were from certain individual patients, which could overestimate proportions of women seeking care. The study design prohibited direct access to patient-level information or narratives provided by victims that may be available in the medical records and could provide context and richer detail to the analysis. Because data in NEDS were not originally designed for the purpose of this study, examining the impact of potential socioeconomic risk factors that were not collected, such as individual patient income level, education, employment, race/ethnicity, or gender of abuser on the likelihood of reporting strangulation codes, was not possible. Additionally, if medical record documentation did

not clearly link strangulation as a contributor to injury diagnoses, the opportunity to administratively apply a strangulation-specific code may have been missed.

The final analytic dataset included a very small percentage of observations with missing values for patient ZIP-code income quartile (<3%), a variable that could serve as a surrogate for income or socioeconomic status. Given the missing data's distribution in both non-strangulation (2.88%) and strangulation (1.99%) coded visits in this dataset, no imputation procedures were performed. Although this is unlikely to have biased the results, as regional or state-level prevalence estimates of IPV-coded visits was not an aim of this study, future studies could consider use of imputation procedures.

Women experiencing multiple strangulations have been reported to seek care at greater frequencies than those with fewer strangulations,[25] so those coded as such in this sample may indicate increasing abuse severity, possibly overestimating co-occurring symptoms. Studies of ICD-9-CM coding used to identify illness/injury have reported that variable accuracy and miscoding of visits could exist.[34-38] Also, if identification and subsequent documentation and coding of strangulation is reliant on clinicians' ability to visualize injuries, these findings may be woefully underestimating the prevalence of strangulation in IPV-related ED visits. Women could also experience memory loss related to hypoxia or other injury related to the physical assault as well as from the psychological trauma of the event, limiting their ability to recall and share this important mechanism with their care team. This study was also unable to evaluate data on women who declined to seek ED care or who died before being able to seek care, which could contribute to underestimates of injuries.

Implications for Emergency Nurses

- Recognition of strangulation in women visiting the ED is critical to both their immediate and long-term health. Emergency nurses on the front lines of care are well positioned to lead post-strangulation identification and treatment efforts. They should have a high index of suspicion in women visiting for IPV and encourage colleagues to consider this high-risk violence mechanism in their assessments, differential diagnoses and decision making.
- Accurate documentation of strangulation and detailed notes describing symptoms and injuries can support individual women's needs for acute and long-term care follow-up, future legal recourse, and larger epidemiologic studies.
- During regular screening of all patients for intimate partner violence, using behavior-specific questions related to strangulation for those endorsing IPV histories is strongly advised. For example, ED nurses can ask about any pressure applied to the neck, versus "strangled" or "choked," which has been found to be more confusing to patients. Past and multiple strangulation events should also be assessed, as NF-IPS places women at greater risk for intimate partner homicide and long-term neurological symptoms.
- Subtle findings during both clinical history gathering and physical assessment can give clues to recent strangulation. Significant risk to life can exist with limited to no external injuries. Also not easily visualized, consider the potential for brain injury in this population during assessments, care and discharge planning.

Conclusions

Non-fatal intimate partner strangulation of women can result in significant and potentially lethal injuries. This study adds to the limited literature on this unique violence mechanism by exploring nine years of U.S. emergency department NF-IPS coding trends among visits by women 18 years and older coded for IPV. A lower prevalence than that reported in existing studies may either reflect an underestimate of true NF-IPS visit prevalence or suggest a very low rate of ED care-seeking for this vulnerable population. Adjusting for visit and hospital characteristics and visit year, ED coding from this time period reflects a lower odds of strangulation-related visits by older age groups and from non-metropolitan hospitals, and increased odds from higher income ZIP-codes, trauma centers, and non-Northeast regions. Increasing odds of concurrent strangulation codes among IPV visits by adult women in more recent years may reflect greater recognition and documentation of strangulation by front-line clinicians and coding teams. Continued research is needed to further inform clinical care and policy efforts.

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Table 3.2: Prevalence and Baseline Characteristics, ED Visits by Women Ages 18+ and with ICD-9-CM IPV Code, Nationwide Emergency Department Survey (NEDS) 2006-2014 (weighted)

	Total IPV visits	IPV, no strangulation code	IPV, with strangulation code	p-value
N, unweighted	49675	49073	602	
N, weighted	225727	222991	2736	
Weighted prevalence (99% CI)		98.79% (98.53-99.00)	1.21% (1.00-1.47)	
Age (mean, 99% CI)	35.34 (35.11-35.57)	**35.37 (35.14-35.61)**	**32.94 (31.82-34.06)**	**< 0.01**
	column %	***column %***	***column %***	
Age Categories				**< 0.01**
18-24	19.36	19.30	23.62	
25-34	34.47	34.39	41.14	
35-44	24.90	24.95	20.88	
45+	21.27	21.36	14.37	
Income Quartile for Patient's ZIP-Code[a]				0.10
Quartile 1	35.83	35.90	30.16	
Quartile 2	28.13	28.13	27.83	
Quartile 3	21.67	21.62	25.65	
Quartile 4	14.37	14.35	16.36	
ED Disposition				0.28
Treat/ Release	95.28	95.26	96.25	
Admit	4.72	4.74	3.75	
Payer				0.12
Medicare	7.19	7.19	6.74	
Medicaid	34.35	34.31	37.28	
Private Including HMO	25.36	25.41	21.27	
Self-Pay	27.16	27.18	26.23	
No Charge/ Other	5.94	5.91	8.48	
Hospital Region				**< 0.01**
Northeast	18.48	18.59	9.74	

	Total IPV visits	IPV, no strangulation code	IPV, with strangulation code	p-value
N, unweighted	49675	49073	602	
N, weighted	225727	222991	2736	
Midwest	26.55	26.40	38.62	
South	33.18	33.27	25.97	
West	21.79	21.75	25.66	
Trauma Center Indicator				**< 0.01**
Level III/Non-Trauma	70.21	70.37	57.44	
Level I/II or collapsed	29.79	29.63	42.56	
Urban-Rural Hospital Location				**< 0.01**
Metropolitan	80.89	80.78	89.59	
Non-Metropolitan	18.12	18.23	9.14	
Collapsed NOS	0.99	0.99	1.27	
Teaching Status				**< 0.01**
Metropolitan Non-Teaching	39.57	39.55	41.47	
Metropolitan Teaching	42.31	42.23	49.40	
Non-Metropolitan	18.12	18.23	9.14	
Survey Year				**< 0.01**
2006	12.00	12.06	7.08	
2007	11.07	11.12	7.16	
2008	11.63	11.67	8.06	
2009	11.15	11.17	9.28	
2010	12.06	12.06	11.78	
2011	10.70	10.72	9.35	
2012	11.03	10.98	15.11	
2013	9.82	9.80	11.55	
2014	10.55	10.42	20.63	

[a]Estimated median household income for residents in patient's ZIP code, values 1 (poorest) to 4 (wealthiest) populations
Bold denotes statistical significance, $p < 0.01$

Table 3.3: Top 5 Principal Clinical Classification Software (CCS) Diagnosis Categories (weighted), ED Visits by Women Ages 18+ with ICD-9-CM IPV Code, Nationwide Emergency Department Survey (NEDS) 2006-2014

Principal CCS Category (Descriptor, Category Number)	Total IPV visits % (99% CI)	IPV, without strangulation code % (99% CI)	CCS Rank	IPV, with strangulation code % (99% CI)	CCS Rank	p-value[a]
Superficial Injury; Contusion (239)	31.82 (30.63-33.04)	**31.98 (30.79-33.19)**	1	**19.37 (14.83-24.90)**	2	**< 0.01**
Other Injuries and Conditions Due to External Causes (244)	24.72 (22.94-26.60)	**24.38 (22.62-26.23)**	2	**52.79 (45.13-60.33)**	1	**< 0.01**
Sprains and Strains (232)	7.64 (7.19-8.12)	7.67 (7.22-8.15)	3	5.21 (3.27-8.21)	3	0.03
Other Complications of Pregnancy (181)	3.47 (3.17-3.81)	3.46 (3.16-3.80)	5	4.14 (2.37-7.16)	4	0.41
Spondylosis; Intervertebral Disc Disorders; Other Back Problems (205)	1.69 (1.51-1.90)	**1.67 (1.49-1.88)**		**3.26 (1.81-5.81)**	5	**< 0.01**
Open Wounds Head/Neck/Trunk (235)	5.94 (5.61-6.27)	**5.99 (5.67-6.33)**	4	NR		<0.01

Bold denotes statistical significance, $p < 0.01$; NR = not reportable per Data Use Agreement

Table 3.4: Odds Ratios (OR) and 99% Confidence Intervals (CI) of Strangulation-Coded Visits by Different Covariates Nationwide Emergency Department Survey (NEDS) 2006-2014 (weighted)

	Model 1[a]	p-value	Model 2[b]	p-value	Model 3[c]	p-value	Model 4[d]	p-value
Age Categories								
18-24	1.00 (Ref)		1.00 (Ref)		1.00 (Ref)		1.00 (Ref)	
25-34	0.98 (0.74-1.29)	0.84	0.97 (0.72-1.29)	0.77	0.97 (0.73-1.30)	0.80	0.94 (0.70-1.26)	0.61
35-44	**0.68 (0.49-0.95)**	**< 0.01**	**0.70 (0.50-0.98)**	**< 0.01**	**0.69 (0.50-0.97)**	**< 0.01**	**0.69 (0.49-0.96)**	**< 0.01**
45+	**0.55 (0.39-0.78)**	**< 0.01**	**0.51 (0.34-0.77)**	**< 0.01**	**0.52 (0.35-0.77)**	**< 0.01**	**0.49 (0.33-0.73)**	**< 0.01**
Income Quartile for Patient's Zip Code								
Quartile 1	1.00 (Ref)		1.00 (Ref)		1.00 (Ref)		1.00 (Ref)	
Quartile 2	1.18 (0.77-1.81)	0.33	1.18 (0.76-1.82)	0.33	1.21 (0.80-1.85)	0.24	1.25 (0.83-1.88)	0.17
Quartile 3	1.41 (0.96-2.08)	0.02	1.49 (1.00-2.20)	0.01	1.46 (1.00-2.15)	0.01	**1.51 (1.04-2.20)**	**< 0.01**
Quartile 4	1.36 (0.87-2.13)	0.08	1.53 (0.98-2.40)	0.02	1.50 (0.96-2.34)	0.02	**1.55 (1.01-2.39)**	**< 0.01**
ED Disposition Status								
Treat and Release	1.00 (Ref)		1.00 (Ref)		1.00 (Ref)		1.00 (Ref)	
Admit	0.78 (0.44-1.41)	0.28	0.92 (0.51-1.66)	0.72	0.82 (0.45-1.49)	0.38	0.83 (0.45-1.52)	0.42
Primary Payer								
Medicare	1.00 (Ref)		1.00 (Ref)		1.00 (Ref)		1.00 (Ref)	
Medicaid	1.16 (0.72-1.86)	0.42	0.84 (0.49-1.45)	0.41	0.82 (0.47-1.42)	0.35	0.81 (0.47-1.39)	0.31
Private/HMO	0.89 (0.54-1.49)	0.57	0.67 (0.39-1.14)	0.05	0.68 (0.40-1.16)	0.06	0.72 (0.42-1.24)	0.12
Self-Pay	1.03 (0.63-1.68)	0.88	0.77 (0.45-1.31)	0.20	0.77 (0.45-1.29)	0.19	0.81 (0.48-1.37)	0.31
No charge/ Other	1.53 (0.67-3.50)	0.18	1.16 (0.49-2.76)	0.65	1.07 (0.48-2.40)	0.83	1.10 (0.52-2.34)	0.75
Trauma Center Status								
Level III/Non-Trauma	1.00 (ref)				1.00 (Ref)		1.00 (Ref)	
Level I/II or Collapsed	**1.76 (1.15-2.69)**	**< 0.01**			**1.64 (1.09-2.48)**	**< 0.01**	**1.64 (1.10-2.46)**	**< 0.01**
Hospital Urban/Rural Status								
Metropolitan	1.00 (Ref)				1.00 (Ref)		1.00 (Ref)	
Non-Metropolitan	**0.45 (0.27-0.75)**	**< 0.01**			**0.56 (0.33-0.93)**	**< 0.01**	**0.59 (0.35-0.97)**	**< 0.01**
Collapsed NOS	1.16 (0.53-2.55)	0.63			1.18 (0.49-2.83)	0.63	0.81 (0.34-1.97)	0.55
Hospital Region								
Northeast	1.00 (Ref)				1.00 (Ref)		1.00 (Ref)	
Midwest	**2.79 (1.52-5.14)**	**< 0.01**			**3.04 (1.68-5.50)**	**< 0.01**	**3.01 (1.67-5.43)**	**< 0.01**

	Model 1[a]	p-value	Model 2[b]	p-value	Model 3[c]	p-value	Model 4[d]	p-value
South	1.49 (0.88-2.53)	0.05			**1.90 (1.10-3.30)**	**< 0.01**	**1.92 (1.11-3.32)**	**< 0.01**
West	**2.25 (1.34-3.77)**	**< 0.01**			**2.49 (1.50-4.12)**	**< 0.01**	**2.42 (1.47-4.01)**	**< 0.01**
Year								
2006	1.00 (Ref)						1.00 (Ref)	
2007	1.10 (0.58-2.06)	0.71					1.09 (0.60-2.01)	0.71
2008	1.18 (0.70-1.96)	0.41					1.17 (0.69-1.99)	0.44
2009	1.41 (0.70-2.86)	0.21					1.36 (0.68-2.70)	0.26
2010	1.66 (0.83-3.32)	0.06					1.53 (0.76-3.05)	0.11
2011	1.48 (0.75-2.96)	0.14					1.44 (0.72-2.85)	0.17
2012	**2.34 (1.18-4.64)**	**< 0.01**					**2.29 (1.17-4.48)**	**< 0.01**
2013	**2.01 (1.01-3.98)**	**< 0.01**					1.97 (1.00-3.88)	0.01
2014	**3.37 (1.72-6.59)**	**< 0.01**					**3.21 (1.68-6.13)**	**< 0.01**

[a]Model 1 is unadjusted; [b]Model 2 is adjusted for visit variables (age categories, income quartiles per zip code, ED disposition status, primary payer); [c]Model 3 is adjusted for Model 2 covariates and hospital variables (teaching status, trauma center status, urban/rural status, region); [d]Model 4 is adjusted for Model 3 covariates and visit year (2006-2014)
Bold denotes statistical significance, $p < 0.01$

CHAPTER 4: MANUSCRIPT THREE

I Didn't Even Put a Label on It: A Mixed Methods Study of ED Visits by Women after Intimate Partner Strangulation

Formatted for submission to Journal of Emergency Nursing
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Abstract

Introduction: Strangulation is a distinct violence mechanism resulting in acute and long-term risks to women's health. This study examines and describes women's emergency visits and care-seeking experiences, including recognition, evaluation, and communication of symptoms, injuries, and health risks after non-fatal intimate partner strangulation (NF-IPS).

Methods: This mixed-methods study used a convergent parallel design to triangulate and integrate quantitative data from the 2006-2014 HCUP Nationwide Emergency Department Sample (NEDS) with qualitative interviews and medical record reviews of women seeking ED care after NF-IPS.

Results: The most common co-occurring ICD-9-CM code groups among all IPV-related NEDS ED visits and comparisons of IPV visits with and without strangulation codes are presented along with interview and medical record findings regarding women's injuries and experiences. Medical record clinical impressions and final diagnoses included domestic violence, domestic abuse or sexual assault, but not specifically strangulation. Interviews reflected participants did not have a sense of long-term risk from their injuries beyond addressing emotional trauma. Women noted nursing support was a treatment in and of itself that allowed them to be heard and validated.

Discussion: This study contributes to the growing NF-IPS literature by providing national-level common disease and injury codes found in IPV-related ED visits and rich details of women's ED care-seeking after surviving strangulation by their partner. Emergency nurses are strongly positioned as clinical practice leaders and policy/legislative advocates to improve collective responses to this dangerous violence

mechanism. NF-IPS research is nascent and further research is warranted to expand on this knowledge, particularly in longitudinal cohorts.

Contribution to Emergency Nursing Practice

The current state of scientific knowledge on non-fatal intimate partner strangulation (NF-IPS) of women indicates acute and long-term risks to women's health and increased odds of homicide exist.

The main finding of this research is that opportunities exist to improve effective communication of NF-IPS health risks both directly during ED visits and nationally through medical coding.

Key implications for emergency nursing practice from this research are emergency and forensic nurses are well positioned as clinical leaders to improve collective responses to NF-IPS.

Key words: strangulation; intimate partner; violence; women's health

Introduction

Strangulation, external pressure on the neck inhibiting cervical blood flow and oxygenation,[1] is a distinct mechanism of violence against women. Lifetime prevalence of non-fatal strangulation by an intimate partner (NF-IPS) has been estimated at almost 10% in the general U.S. female population, as opposed to 0.7% in men,[2] and much higher in the subpopulation of women severely abused by partners.[3-5] Evidence, although not yet populations-based, demonstrates that NF-IPS can result in both acute and long-term risks to women's health. Case reports and small- to medium-sized retrospective and clinical studies have cataloged significant traumatic injuries including stroke,[6-8] carotid artery dissection,[7,9,10] brain injury,[3,8,11-13] seizures,[7] miscarriage,[14-16] and PTSD.[10,17] Strangulation is also emerging as a potential contributing factor for long-term central nervous system symptoms such as concentration and memory challenges.[3]

Mortality potential exists as well. Adjusting for demographic variables, non-fatal IPS was found to significantly increase a woman's future risk of intimate partner homicide (OR 7.48, 95% CI: 4.53-12.35) or attempted homicide (OR 6.70, 95% CI: 3.91-11.49), although other potential confounders beyond demographics were not tested.[18] In a meta-analysis examining risk factors for female victimization or male perpetration of attempted or completed partner homicide, previous non-fatal strangulation of their partner was found to increase male perpetrators' odds of intimate partner homicide by seven times (OR = 7.23, $p < 0.001$), only surpassed by direct access to guns or previous threats with a weapons.[19] In caveat, the meta-analysis authors calculated these odds based on five studies, four of which were from the same parent study and included statistics from Glass and colleagues as previously mentioned. Further, strangulation ("hanging,

suffocation, strangulation") accounted for 10.5% (1017/10018) of intimate partner homicides of women (ages 18+) from 2003-2014 in the 18-state analysis of the National Violent Death Reporting System database.[20]

Current literature suggests relatively small but variable proportions of women that seek medical care after strangulation.[21] Only 5% of a sample of 300 NF-IPS cases submitted for prosecution sought care within 48 hours, generally for pain, voice changes or difficulty swallowing or breathing.[16] A convenience sample of 101 women recruited from a violence intervention/prevention center, an emergency department (ED), and domestic violence (DV) shelters found that, although symptoms and injuries were commonly reported, women endorsing "medical problems" after NF-IPS was limited, from 3% of those strangled a single time to 27% of multiple strangulation cases.[17] Care seeking increased with frequency of strangulation events: only 17.5% of those strangled once endorsed seeking medical help compared to 39% of women strangled more than five times.[17] In contrast, a clinical forensic medical program that screens for IPV and if present, also screens for NF-IPS, reported 69% of 102 non-fatal strangulation cases received medical treatment after their assault, of which 10% were hospitalized for extensive injuries.[15] Nationally, prevalence of ICD-9-CM strangulation coding among U.S. emergency department IPV-coded visits by women ages 18 and older between 2006-2014 has been estimated at 1.2%.[22] Although significant coding increases were observed in 2012 and 2014 compared to 2006, this is likely a considerable underestimate of post-NF-IPS care seeking by women, owing to limitations in strangulation recognition, documentation and coding reimbursement.[22]

Reported NF-IPS symptoms and injuries reflected in existing literature vary in definition/description and frequency. To illustrate, Zilkens and colleagues report neck and throat pain together at 46.8% in a sample of 79 women ages 13 and older presenting to a sexual assault center and endorsing IPS.[23] Wilbur and colleagues identified neck pain (28/41, 68%) separate from a sore throat (24/41, 59%) in their sample drawn from women at DV shelters and a violence intervention program.[24] Strack and colleagues note no symptoms documented or reported in 67% of 300 police reports submitted for prosecution after NF-IPS, but of those documented, the most common report was for pain "believed to be of the neck or throat" (18%) and sore throat consolidated within the 7% of "other symptoms."[16] Regardless, emerging literature reflects that women are not escaping these assaults physically or emotionally unscathed, with myriad serious physical and psychological sequelae. [3,21,22,25] Examination of national-level comparisons of injury and imaging coding for abused women with and without NF-IPS would add to our understanding of current recognized ED presentations and evaluations.

Studies have also suggested that women may minimize symptoms or not report they were strangled,[6] not clearly recall details of their trauma,[15] be fearful or uncomfortable sharing information with the health care team,[6] and/or can have injuries difficult to visualize unaided,[16,26] all of which may contribute to diagnostic and treatment challenges. Best practice recommendations are emerging to help guide post-strangulation evaluation; [27-29] however, research examining IPS survivors presenting to an emergency department, our current care approaches to their needs, and our processes for communicating strangulation-related injuries and health risks, is currently lacking.

This study aimed to examine and describe women's ED visits and care-seeking experiences including ED team recognition, evaluation, and communication of symptoms, injuries, and health risks after NF-IPS. To achieve this purpose, quantitative diagnostic, injury and imaging codes from a national dataset were triangulated and integrated with qualitative interviews and ED medical records of women after NF-IPS to more comprehensively understand their clinical presentations, needs, and care experiences. This examination of the quantitative data in concert with rich experiential descriptions from patients and medical record "deep dives" expands the currently limited evidence on ED visits and diagnostic and treatment challenges associated with NF-IPS of women, further informing our clinical approaches, future research and policy recommendations.

Conceptual Framework

To address this aim, the study was framed within the National Academies of Science, Engineering and Medicine's conceptualization of the diagnostic process (see Figure 4.1).[30] Viewing the findings through the diagnostic process prism allows for practical examination of discrete points in the framework, to recognize strengths and challenges in post-strangulation emergency care approaches. For this study, NF-IPS is operationally defined as an act that leads to significant health problems, namely physical and psychological injury, leading then to women engaging with the health care system through the ED. Their clinical team then begins gathering, integrating and interpreting information via history taking, physical exam, and any necessary diagnostic testing and consultation. Learning that strangulation occurred during an assault will provide the team

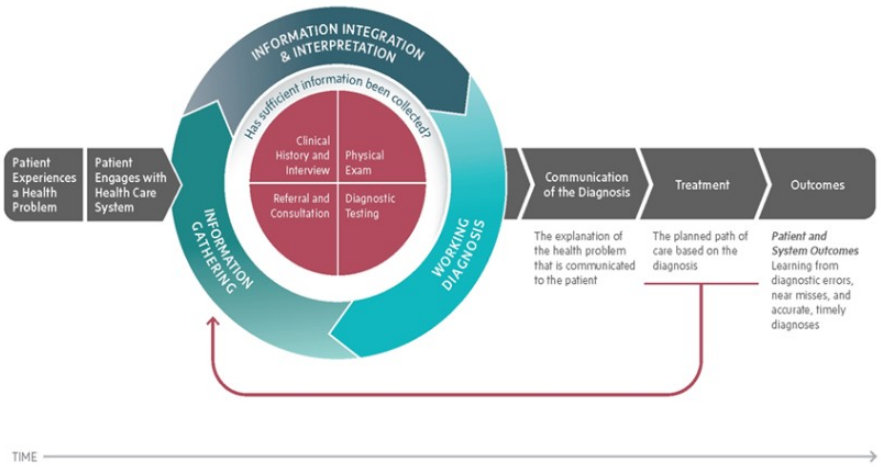
with important information as they evaluate and diagnose potential life-threatening injuries.

In the ED and other health care settings, diagnosis is a process and means of classifying pre-existing, agreed upon categories indicating specific conditions, thus supporting timely treatment and, ideally, positive health outcomes.[30,31] Diagnosis can serve to empower individuals, affirm patients' lived experiences, validate their symptoms, and potentially connect them to new support networks.[31] Communicating diagnoses and contributing causes of injuries through electronic health records and coding mechanisms like the World Health Organization's International Classification of Diseases (ICD) can support longitudinal continuity of an individual's care as well as broader epidemiologic studies of a health concern.

Unlimited in scope and demands, highly variable, time-pressured and often unpredictable, the ED is a complex and dynamic environment where undifferentiated illness and injury are common.[32] However, the diagnostic process used to determine and explain patients' health problems and guide care decisions is a recognized area of vulnerability.[33-35] The critical necessity of patient and family partnerships, as well as true collaboration within the healthcare team, to improve diagnostic processes has been nationally emphasized.[30] This can be especially important in NF-IPS when survivors may not clearly recall details of their trauma or may be fearful of sharing information with the care team due to stigma or safety concerns.[6]

Recognizing NF-IPS allows us to share critical information and guidance that women may use as they make decisions in the contexts of their unique situations.

Emergency nurses, functioning in both bedside and expanded scopes of practice, are well positioned to lead these efforts.[36]



Balogh, E. P., Miller, B. T., & Ball, J.R. (Eds.) (2015). *Improving diagnosis in health care*. The National Academies of Sciences, Engineering, and Medicine. Washington (DC): National Academies Press.

Figure 4.1. Diagnostic process (used with permission). Balogh, E. P., Miller, B. T., & Ball, J. R. (eds.). (2015). *Improving diagnosis in health care*. The National Academies of Sciences, Engineering, and Medicine. Washington, DC: National Academies Press

Methods

This study used a convergent parallel mixed-methods design, with a single phase of concurrent data procurement and collection.[37] The approach employed both data triangulation (national all-payer data across multiple years, interviews, medical record reviews) and method triangulation (quantitative and qualitative). The diagnostic process, as conceptualized by NASEM,[30] was used to frame data collection and analysis (see Figure 4.1). Analyses of quantitative (i.e., national dataset) and qualitative (in-depth interviews, medical records) data were performed separately [22] then compared and main findings integrated ("mixed") during the interpretation phase.[37,38] Software used for

analysis included STATA 14.2 SE [39] (for quantitative) and NVIVO[40] (for qualitative). This study was reviewed and approved by IRBs from Johns Hopkins Medicine IRB (JHMIRB00146647) and Mercy Medical Center (MMCIRB1364730).

Description of quantitative sample. A cross-sectional analysis of 2006-2014 Nationwide Emergency Department Sample (NEDS) data accessed from the Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP).[41] NEDS, the United States' largest all-payer ED database, allows for regional and nationwide estimates from approximately 120-135 million ED visits/year (weighted).[41] Visits to a U.S. ED by women ages 18+ with a concurrent International Classification of Diseases (ICD-9-CM) code for intimate partner violence (IPV; "E967.3") were included in this analysis. Codes specific to "Suicide and Self-Inflicted Injury" (E950-E959) were excluded. Study variables are presented in Table 4.1.

Table 4.1: Study Variables

Non-Fatal Strangulation (Outcome Variable)	IPV visit with a concurrent ICD-9-CM diagnostic and/or external cause of injury code of: • 994.7 ("asphyxiation and strangulation") • E963 ("assault by hanging and strangulation") • E983.8 ("strangulation or suffocation by other specified means undetermined whether accidentally or purposely inflicted"), and/or • E983.9 ("strangulation or suffocation by unspecified means undetermined whether accidentally or purposely inflicted")
Co-Occurring ICD-9-CM and CPT Codes	Additional co-occurring ICD-9-CM diagnosis, external cause of injury, and procedure codes
Visit Year	2006-2014

Relevant individual co-occurring ICD-9-CM codes (see Table 4.2) to include in each category were identified *a priori* through an integrative evidence review of injuries reported by women seeking emergency care after intimate partner strangulation,[21] national guidelines for medical and radiologic evaluation of post-strangulation patients,[29] and in consultation with certified coding specialists from a multi-site health care system. Codes were individually explored then analyzed using Pearson's Chi-squared test within their ICD classification category, as listed in Table 4.2. To account for multiple comparisons, p-values of < 0.01 were considered statistically significant. A further description of methods employed to analyze this sample can be found elsewhere.[22]

Description of qualitative sample. The investigator recruited women, 18 years or older, who sought emergency department (ED) care for IPV including strangulation at an urban, non-trauma, academic-affiliated medical center. This ED includes a robust forensic nurse examiner (FNE) program, providing forensic examination for victims of intimate partner or interpersonal violence and serving as the city's designated center for assessment of victims and perpetrators of sexual assault. Nurses from this program asked women meeting basic study criteria if they would be willing to be contacted by a member of the research team. Basic criteria included individuals 18 years or older, self-identifying as women, seeking care in an ED after surviving strangulation by an intimate partner, and able to speak and understand English.

From March 2018 through January 2019, forty-three women met study criteria and twenty-three (53%) agreed to be contacted by the study team. Of the twenty-three, six women (26%) were unable to be contacted, four of whom either hung up during the greeting or did not answer, and two had disconnected lines without other available

contact information. Seventeen women (74%) were successfully contacted, one of whom did not meet the study's criteria (her assault was by a non-partner). Of the remaining 16, eight did not enroll: one stated she was not interested; five scheduled to meet but did not arrive and attempts to re-contact (3/5) or reschedule (2/5) were unsuccessful, and two stated they wished to connect later, but subsequent attempts were unsuccessful. Ultimately, eight women (50% of eligible contacted women) agreed to participate and were successfully enrolled in the study.

Women were offered an interview in a private room within the referring ED, and five of the eight chose that option. Three women opted for interviews outside of the referring ED: one at her place of employment, one at a domestic violence shelter and one at a hotel. Seven of the eight participants also provided consent to review their associated medical records; no explanation was offered by the single declining participant. The total time for each participant, including both informed consent and interview, was less than 90 minutes. All participants received a $20 gift card at the end of the interview in appreciation of their time and contribution.

Ethical Considerations and Participant Protections

Given the vulnerability of this population, special consideration was given to safeguarding their information. All national data was de-identified before being released from HCUP, and use of the data follows the AHRQ HCUP Data Use Agreement. Qualitative interviews were assigned a unique identification number during consent and enrollment. These ID numbers were then detached from names and medical record numbers and kept in a separate, secured server data file only accessible to the study's team members. All paper documents containing sensitive or identifying information were

separately secured in a locked cabinet in the investigator's office. All electronic data, including electronic recordings of qualitative interviews, transcriptions, and medical record abstractions were stored on password-protected servers hosted by Johns Hopkins University and do not contain identifying information. The audio-taped interviews were transcribed by a private, secure transcription service with an approved JHU contract, and each participant was identified only by her ID number during the recording. Destruction of all electronic and hard-copy study data will be in accordance with IRB and regulatory requirements.

Provision for the protection of study participants was guided by the protocol set forth by the Nursing Research Consortium on Violence and Abuse (NRCVA) and the detailed study interview manual including specific details on safety measures is available as Appendix A. Additionally, a Certificate of Confidentiality was obtained from the National Institute for Nursing Research at the National Institutes of Health to provide additional research data protections against compelled disclosure of personally identifiable material, to the extent permitted by law. Participants were provided with a description of the certificate's protections in the informed consent form. While renewing the certificate, there was a period in which it was not active, and the two affected participants were made aware of this before informed consent was obtained.

Instrument

Semi-structured interviews were conducted, each lasting approximately one hour, using an interview guide with open-ended questions. Medical record reviews were subsequently completed for those providing consent (n=7, 87.5%). Areas explored during interviews included: circumstances of the assault; motivators for and hesitations about

seeking health treatment after being strangled; symptoms and details shared with nursing, providers and the care team; expectations for the health care response; satisfaction with care; comprehension of diagnosis and health/safety risks provided by nursing and the health care team; and the role of nurses and other providers in women's decisions to complete treatment and/or use referrals for follow-up care and services. Also based on NASEM's diagnostic process conceptualization,[30] a standardized data collection tool was developed to gather the following information from participant's medical records: demographic information; clinical history and interview; physical examination; working and final diagnoses; diagnostic testing; progress and treatment notes; referrals and consultations; and communication diagnoses/health problems (e.g. patient education, discharge teaching) (see Appendix E for model section-specific questions and data elements). For this study, the ED team was defined as nurses and prescribers interacting with the woman during her visit. As violence prevention advocates were employed outside of the study site, they were considered consultants/referrals.

Procedures

With participants' permission, individual interviews were audiotaped and transcribed verbatim. At least 10 minutes of each audio recording was reviewed and compared to its respective transcript by a study team member to check accuracy. An initial read-through of each interview was completed, followed by a second, more detailed read, with each line and text section systematically and deductively hand-coded by this investigator using an *a priori* template.[38] This template was developed from both the research aims and NASEM's conceptual model of the diagnostic process,[30] as a

means of initially organizing the information, and was also applied to the medical record elements. (see Appendix C for codebook)

Coding was reviewed and compared to that of the same interviews and medical record abstractions independently coded by a second study team member (FS), to improve the rigor of data preparation for analysis. If differences in statement interpretation occurred, portions of text were re-examined for clarity. Final determination of category application was made by the principal investigator. The interview transcripts and medical record abstractions were then uploaded to qualitative data analysis software (NVIVO 12)[40] and agreed upon codes applied, allowing further comparisons across interviews. To protect their privacy yet honor their personhood, each participant is represented by a pseudonym chosen from an online random name generator for this manuscript.

Medical record information was reviewed and interpreted in concert with qualitative interview data, to explore how it converged and diverged from women's recollections, understanding of interactions with, and advisement by nursing and other health care team members, as well as to counterbalance and identify possible systematic bias that may have existed in either participants' recollections, medical record discrepancies and/or sampling. This data was further integrated and triangulated with the national quantitative data to analyze and synthesize co-occurring injuries, diagnostic imaging, and other abuse and visit experiences.

Results/Findings

This mixed-methods study used a convergent parallel design to triangulate and integrate quantitative data from the 2006-2014 HCUP Nationwide Emergency

Department Sample (NEDS) with qualitative interviews and medical record reviews of women seeking emergency department care after NF-IPS. The results/findings are presented within their respective NASEM diagnostic process model sections.

Experiencing a Health Problem and Engaging with the Health Care System

From 2006 through 2014, there were 225,727 U.S. emergency department visits by women ages 18 and older coded for intimate partner violence, of which 2,736 had a concurrent code for strangulation (NEDS, weighted), approximating a 1.2% prevalence or 121 NF-IPS visits per 10,000 IPV visits. The mean age for visits with both IPV and strangulation codes (32.94, 99% CI: 31.82-34.06) was significantly younger than for visits with IPV codes alone (35.37, 99% CI: 35.14-35.61). Other demographics, visit and hospital variables are reported elsewhere.[22]

Ages of the eight interview participants ranged from their early 20's to early 60's, with a mean age of 33 (median = 27.5), similar to the NEDS national estimates. Four were currently employed with three in the medical field, two of whom were also students. Half of the participants (4/8) presented to another ED for care before the study referral. Time from strangulation assault to their first ED visit was two days or less for most of the women, although it took over a week for Carole to seek help because "…he bruised my face up really bad and I couldn't leave."

Partners were described as a boyfriend (6/8), husband (1/8) or "friends who were intimate" (1/8), with relationships spanning five months to seven years. Feleysa had two children, one of whom was fathered by the perpetrator. Mae and Olivia both had children from previous relationships, and the other five participants did not have children. Six

women were living with their partner at the time of the IPS event precipitating the ED visit.

Previous experiences with violence. Seven of the eight women described violence in their past, some by a previous partner. Mae, who had been in foster care from a young age, disclosed having been strangled more than five times by a former boyfriend. Others described histories of abuse by past boyfriends and painful childhoods. Though not strangers to violence, some noted that this relationship was their first IPV experience. Carole divulged a history of sexual abuse by her brother, as well as abuse by her mother and a grandmother but no previous IPV. Sophie shared that she had dated "a**holes…bad boys," and acknowledged negative verbal exchanges and degrading interactions but no physical assault. Jolena also denied any prior IPV but shared that her parents fought when she was young, over his infidelity, and they separated when she was in grade school.

Health histories. Interviews and medical records revealed a range of long-standing health issues for these women, both physical (seasonal allergies requiring steroids, asthma, seizures with associated memory issues, HIV, hypertension, spinal stenosis, chronic back pain, arthritis, diabetes, bursitis, migraines, renal problems, acute MI, ruptured vertebral discs) and psychological (ADHD, depression, anxiety, PTSD, SI, weight/diet problems, insomnia, other psychiatric disorder). All of the participants had previously sought care in an emergency department for various illnesses or injuries, most not directly related to violence.

Experiencing strangulation by an intimate partner. For three of the women, it was not the first time this partner had strangled them. Carole reported that he strangled

her “maybe more than 20” times during their relationship. Feleysa stated she could not count on her hands the number of times he strangled her. Sophie shared that her partner had “been testing choking” during sex for several months:

> “We’ve played around with it before. It’s just a gentle hand pressure, nothing to what he was doing for the past couple months of placing both hands around my throat and pushing down…I told him that he was choking me and that it hurt, and then I asked him to stop, and he’s like ‘Well, I didn’t push down in the center on your trachea. I pushed down on the sides,’ basically saying pushing down on the sides wouldn’t cause any damage to me. He does (martial arts). He knows how to choke people.”

Mae was strangled more than five times in a previous relationship, though the event bringing her to the ED was the only time her current partner had strangled her: “I think (this time was) just different because he actually pulled a gun on me.” For Amberle, Jolena, and Ishawna, this was the first time they had suffered this specific method of violence.

All participants reported manual strangulation, half with two hands and the other half with a single hand. Carole recalled her partner strangled her 9-10 times during this particular event. Abusive partners strangled the women while sitting on top of them, standing on the floor while she laid on the bed, pushing her against a wall, on the ground, on the bed, or while she was standing or seated. In all cases, the participants were approached from the front and able to see their attacker: “…he had his hands around my neck, and I could see his eyes” (Feleysa). They estimated the strangulation lasted ~15 seconds to a minute, with perceptions of that time ranging from “this happened fast” to “it felt like forever.” In five events, other weapons were involved: three with guns and two with knives, one of which also included fire-setting by her partner.

Engaging in care and identifying needs. Going to the ED was a "means to an end" for the participants, but not necessarily for diagnosis and treatment. It was a place to have their stories and injuries validated by others and documented to support protection orders and future legal actions. Minimization of injuries was common, and all visits were at the recommendation of police or others the women trusted.

In the immediate aftermath of the event, most participants initially sought help from law enforcement versus going directly to the ED, suggesting the experience was not seen primarily as a health problem. Five contacted police directly, and one was driven by friends to the courthouse. Four subsequently went to the ED at the advisement or suggestion of police. Those not involving police first sought care at the strong encouragement of others, like Ishawna's work supervisor or Carole's relative who helped her escape: "While we were in the car, I showed her my face, and she stopped the car, and she just cried, and she took me to (ED)." After calling her case worker, Mae gathered her belongings, took them to a storage unit, then went to the ED. Mode of arrival to the ED varied, with two transported by police, two by EMS, two by family or friends and two by themselves.

Many agreed they should seek care, but generally for reasons other than the strangulation. Physical concerns included symptoms like head pain, finger or shoulder pain, vaginal discharge, head/body bruises or tachycardia. Others sought forensic evaluation and documentation. Mae's case worker "…said even if I didn't want to press charges, I still need to go get seen so that it's on file in case he ever tries to do anything, if he sees me in public." Half sought care at another ED first before coming for the specialized forensic services offered at this hospital. Some had presented to the nearest

ED after visiting the courthouse or commissioner's office. Carole shared that a relative first brought her to a hospital for which they both had familiarity and comfort:

> "…that's my favorite hospital. I've been going there since—I was born there and I have been through (abuse)…I know a lot of people there and pretty much, they love me there."

Ishawna required care at multiple facilities due to the extent of her injuries. Focused on her concurrent head trauma, she did not initially consider her experience as an assault:

> "I didn't even-I just didn't even put any label on it…I didn't even think about what the situation that caused the concussion was. It was almost like I compartmentalized it, and just closed it out."

Notably, based on Feleysa's previous life experiences, the act of going to an emergency department signified the finality of ending her relationship:

> "I figure from—in my past, I knew once I opened that door, there was no turning back. I never wanted to go to that extent where I knew going to the emergency room would mean criminal charges for him. I never wanted to pursue that route, but I knew at some point I had to. So then, once I got here (the ED), it was just, like, let's start the process. This is where it has to be now. So I don't think there was any worries. I just wanted everything to end. Like, if this is what I have to do for the cycle to end, then this is what I will do."

Information Gathering, Integration, and Interpretation

The ability to gather necessary information for diagnosis and treatment is reliant on building trust and connection with patients. Participants shared several important trust-building behaviors and trauma-informed approaches they witnessed from the ED team: introducing themselves, exhibiting patience, approaching with a calm demeanor, acknowledging "it's not your fault," reinforcing the normalcy of their feelings, judiciously using humor, anticipating questions and explaining each step, rechecking for understanding, offering pain medication or tissues, and therapeutic use of touch.

Participants also voiced feeling safe in an ED. Police and security presence both contributed to women feeling physically protected. Abusers not knowing they had gone to the hospital was also comforting. Some, like Sophie, noted staff quickly moving them from the waiting room after triage was very helpful: "As soon as I got into that back room, I felt safe. I felt like I could breathe…Being with those nurses, being back there was the safest I felt all day…It was the people that made me feel safe." Olivia admitted she had not felt safe in the ED, but attributed this to the uncertainty of her boyfriend and not due to the ED physical environment or staff responses.

Most of the women disclosed the strangulation during clinical history gathering by the team, and this was noted in medical records by both physicians and nurses. However, Amberle's memory of the event was not triggered until the physical exam:

> "(O)ne moment I forgot that he even strangled me until they started feeling my neck and then that's when the flashbacks started coming back, and I told them. I was like 'My neck's sore and it's swollen.' That's when they just started examining my neck…"

Though Jolena felt she clearly communicated she had been strangled, "I didn't really complain about my neck." Sophie was concerned her ED team might confuse marks from her workouts with those sustained during strangulation and wanted to ensure they were not conflated: "I was very clear with the nurse that I (lift weights) and that I do get bruises on my collarbones from a bar."

Symptoms, Injuries and Diagnostic Testing. Various symptoms and injuries associated with the strangulation event, as noted in medical records and participant interviews, are listed in Table 4.3. Women frequently reported breathing changes at the time of the assault and neck pain at either the time of the assault, time of ED visit, or both. One participant developed neck pain after her ED visit. Half reported

lightheadedness or near-loss of consciousness during the strangulation, while Ishawna experienced both loss of consciousness and limited memory of the event. Over half of the women also had external neck injuries, visible unaided and/or via alternate light source (ALS). Other symptoms and injuries varied among the participants, both by type and time frame.

Many of the women indicated that it was important for others to see their injuries. All recalled their physical exams included evaluation for bruising, including the use of (ALS). Increasingly used in forensic practice to identify subdermal injuries that may not be readily seen unaided, [26] ALS was noted by participants to be memorable for its uniqueness. One mentioned that the police told her about ALS while encouraging her to seek care. Positive ALS findings were noted by women as validating their injuries and experiences. However, Mae recalled ALS and photographs taken of what she believed was bruising, although medical record documentation reflected a negative exam. Feleysa did not recall receiving the results of her ALS and wished these would have been shared with her. Medical records noted ALS was also negative in her case.

Within the NEDS sample, head and neck-related diagnostic imaging (ICD procedure and CPT) codes were present in significantly higher percentages for strangulation-coded visits (35.96%, 99% CI: 29.42-43.08) compared to those without strangulation codes (21.60%, 99% CI: 20.29-22.96). Imaging was also ordered for five of the qualitative participants. Two received CTs of the head and maxillofacial areas while at prior EDs, one of which also had a CT of the soft tissues of the neck with contrast for excruciating pain when swallowing. This CT suggested a fractured trachea, necessitating her transfer and observation at a trauma center before presenting for forensic evaluation.

She noted in her interview that she was told later her fracture was "just the thyroid" and not her trachea. Others had x-rays for event-associated injuries of the extremities or chest. One medical record reflected specific consideration given to neck imaging, determining it unnecessary: "She has no historical or current physical examination finding, signs or symptoms of laryngeal/tracheal injury or any vascular or soft tissue injury of the neck."

Diagnosis, Treatment, Outcomes

To examine NEDS visits with symptoms and injuries that could be relevant to strangulation, individual ICD and CPT codes were identified *a priori* and analyzed within their broader ICD code category. The most common co-occurring ICD-9-CM code groups among all IPV-related ED visits were injury and poisoning [46.00% (99% CI: 45.13-46.88)] and symptoms involving the head and neck [8.25% (99% CI: 7.57, 8.99)]. Strangulation-coded visits were significantly more likely than IPV visits without strangulation coding to have concurrent code categories for musculoskeletal/connective tissue symptoms (15.65% vs 4.37%, $p < 0.01$), general symptoms such as altered consciousness (5.42% vs 2.41%, $p < 0.01$), head and neck symptoms (13.60% vs 8.18%, $p < 0.01$), digestive system symptoms such as dysphagia (2.08% vs 0.16%, $p < 0.01$), and injury/poisoning (58.69% vs 45.85%, $p < 0.01$). No significant difference was found between those with and without strangulation codes, respectively, for neurologic/sense organs (3.11% vs 2.07%, $p = 0.12$), respiratory or chest symptoms (5.00% vs 3.95%, $p = 0.23$), or acute mental health conditions (4.04% vs 5.02%, $p = 0.28$). Specific ICD-9-CM and CPT codes included in each group are available in Appendix D.

Further analysis of the injury/poisoning category revealed that visits with internal head/neck-related injury codes were not significantly different between those IPV visits

with strangulation coding compared to those without (4.78% versus 4.53% respectively, $p = 0.79$). However, a significantly higher percentage of visits with both IPV and strangulation codes had a co-occurring external head/neck-related injury code versus IPV visits lacking a strangulation code (55.69% with strangulation versus 43.11% without, $p < 0.01$). Of note, internal injuries in both groups included neurological injury codes such as concussions with and without coma, though the small numbers precluded further analysis.

Qualitatively, all participants recognized and reported their strangulation, but what that meant for their health, both acutely and long-term, was not clear to them. Three women did not recall any specific discussions about strangulation and health risks. Sophie interpreted risk to mean injury from future assaults or unprocessed emotional trauma. Amberle remembered she "…spoke to a doctor, and he was explaining my injuries to me and stuff and said it wasn't nothing—it's not severe but if anything, if I had trouble swallowing and stuff come back to the emergency room…" Her description of this dialogue suggests that the amount of information shared may have exceeded her ability to remember:

> "They said I could—he could have ruptured—it was so many things they said. He could have ruptured something or broke something or had made it hard for me to breathe. They said something about my bones being thinner or something. I don't know. I forgot. They said a lot of stuff. They just said that it could've happened worse if I would never say anything."

All but one of the participants recalled the forensic nurse sharing the ALS exam results, whether positive or negative for subdermal findings. Other injuries were also readily remembered: facial fractures and an eye hemorrhage (Carole), a sprained toe (Feleysa) or finger (Jolena), concussion and thyroid fracture (Ishawna).

Among visits coded for IPV in our NEDS analytic dataset, strangulation coding was present in 1.2%. Of the seven medical records reviewed, strangulation as a specific injury mechanism was not included in documentation of clinical impressions (domestic violence, old facial fractures, conjunctival hemorrhage, ecchymosis, facial contusion, head trauma, non-displaced tracheal cartilage fracture, alleged assault, alleged sexual assault, physical assault, concerns for domestic violence, toe sprain, and hand, neck and back pain) or final diagnoses (two as "domestic abuse," three as "domestic violence" (one of which included a co-occurring diagnosis of "alleged sexual assault" and one as "sexual assault"), though it was included in physician and nursing encounter notes.

Treatment included non-opioid pain medications (acetaminophen, NSAIDS, Flexeril, lidocaine patches, "steroid shot") and recommendations for follow-up with their primary care provider and domestic violence community programs. Sophie recalled, "I didn't have anything physically wrong, so there was no physical care." Several participants noted the support they received from the ED team was, in itself, a form of treatment. Several mentioned the kindness staff conveyed through small gestures, such as the physician showing concern for Feleysa's toe pain, bringing the acetaminophen himself. Discussing the event in detail with the forensic nurses and advocacy team also allowed the women to begin mentally processing the fear-inducing strangulation they had experienced. Jolene recalled having difficulty moving her arm due to neck and shoulder pain, and how the ED team helped her with her clothes:

> "And so, they was kind…They're real kind. Kindness goes a long way and if you feeling bad and somebody kind to you, you don't feel so bad because you feel like somebody cares. Even though you don't know them it feels like somebody cares about you."

Recommended follow-up with primary care providers (PCP) was standard, though few did. Jolena visited her longstanding physician but reported being dissatisfied with her pain control and is now exploring new PCP options. Feleysa was able to find a PCP, not having one before her ED visit, and had scheduled an upcoming appointment. However, most of the women participants sought support through therapy or counseling services. Some were already established with a program or clinician, while others found help through recommendations from the ED and advocate teams.

Discussion

Analyzing NF-IPS emergency department visits within NASEM's diagnostic process framework provided several opportunities to supplement the currently sparse literature on this topic. The discussion will be organized according to the sections of the NASEM framework to which they are most relevant.

Experiencing a Health Problem and Engaging with the Health Care System

Triangulating and integrating the quantitative analysis with interviews and medical records allowed for confirming the findings of both as well as rich descriptions of NF-IPS survivors emergency care-seeking experiences. Though many of the women participants expressed a fear of dying during the strangulation, seeking health care was not their first thought or priority once the event was over. Engaging with health care was suggested by others, such as police, family, friends or other trusted individuals. Once in the ED, most women felt safe and reported that staff exhibited several trust-building behaviors that supported them feeling cared about and included in the process. None of the women expressed reluctance or fear either in seeking care or sharing with staff that they had been strangled, some even before staff asked.

Information Gathering, Integration, and Interpretation

Except for Amberle, whose memory was triggered during the physical exam, all others reported strangulation early in their visit during the clinical history and interview. History and physical exam documentation by physicians included neck and throat evaluations of varying detail. Nursing interviews and assessments documented by FNEs were generally more detailed and descriptive, likely owing to the dedicated time, physical space and specially trained staff afforded by the medical center and forensic and ED leaders. Using ALS, FNEs were able to visualize subdermal findings in five of the eight cases, and these were consistent with women's recollections of their strangulation. Literature is emerging to highlight both the potential uses[44] and current limitations[45] of ALS use in clinical practice. Although further investigation is warranted, use of ALS[26] and other technologies[46] show promise and may provide additional support to guide subsequent diagnostic imaging and differentiation of higher-risk patients. This may be particularly helpful as clinicians consider emerging national post-strangulation medical and radiological evaluation recommendations[29] based in part on each patient's unique clinical picture, as well as issues of radiation exposure risks[30] and ED and health system operational realities like cost containment and overcrowding.[48,49]

The NEDS data revealed greater odds of co-occurring head and neck imaging for those with strangulation-coded visits compared to those without these codes (35.96% versus 21.60%, $p < 0.01$). This finding could be driven by increased external injury findings in strangulation-coded visits that suggest the need for imaging, or possibly that the imaging is providing a clue to coding teams that strangulation may have occurred. Diagnostic imaging was also performed at prior EDs for three of the qualitative

participants, with one receiving a CT of the neck soft tissue due to her presenting complaints of pain and difficulty swallowing. Imaging at the study recruitment ED included x-rays of extremities; however, physicians documented outside ED imaging results as information elements helping to guide their diagnostic and treatment decisions. ED-to-ED phone consultation occurred before Carole's arrival at the recruitment ED with a discussion about imaging. Ishawna's provider used a regional electronic record sharing platform to review her CT results from a previous medical center, illustrating the potential benefit of electronic systems for continuity of care and safety. However, as these records contain incredibly sensitive information and are at higher likelihood for legal involvement, the FNE team at the study recruitment ED primarily documents in a separate system providing additional privacy protections. Though the team mitigates this with verbal information exchange, this may present an access limitation to the ED team as they work together to build diagnostic and treatment plans. Most physician documentation noted stability after the medical screening exam and clearance for FNE exam, but it was unclear if further findings by the FNE influenced additional imaging or treatment changes prior to patient discharge.

Diagnosis, Treatment, Outcomes

The quantitative dataset analysis indicated that the most common co-occurring ICD-9-CM code in IPV-related ED visits is injury and poisoning, which is primarily driven by external injuries like head and neck contusions and abrasions. Overall, the results reflecting co-occurring symptoms of IPV are consistent with the limited existing literature,[14,23,42,43] including the presence of concurrent brain injury in both groups, indicating the significant health risks of IPV and non-fatal strangulation. The largest

differences between the two groups lie in codes for musculoskeletal and connective tissue symptoms, head and neck symptoms, general symptoms, injury and poisoning, and imaging. These differ from findings in earlier studies[16,24] reporting few observable injuries among non-fatal strangulation cases. However, this could suggest that strangulation coding of ED IPV-related visits occurs most frequently in severe or overt presentations. It is also critical to note that many of the co-occurring codes indicate severe injuries with both acute and long-term health implications for women. Interestingly, some of the ICD and CPT codes examined in this study were present in both IPV-only and IPV-strangulation visits (e.g., hypoxemia, dysphagia), which could reflect strangulation in IPV-only visits that were not coded.

Provider-documented clinical impressions and final diagnoses reflected domestic violence, domestic abuse or sexual assault, but none specifically included strangulation, heightening the suspicion that national estimates may be severely underestimating this potentially deadly form of violence. The participants interviewed did not have a sense of continuing risk from strangulation past addressing the emotional trauma they suffered. This reflects the larger issue that NF-IPS research is nascent and needs continued focus. Questions about long-term risks associated with earlier stroke development, disability from traumatic brain injury, or future carotid dissections remain outstanding. Longitudinal studies of abused women who have survived strangulation, particularly regarding neurological and vascular condition development, would strengthen our existing knowledge base.

All of the participants noted that their time with the FNE was supportive, with many suggesting it was a treatment in and of itself, allowing them to be heard and

validated. Positive ALS findings also served to validate injuries and experiences. All appreciated consulting with domestic violence advocates as a standard part of their care, finding them very helpful for safety planning and community resources. As of their interviews, all reported they had ended the relationship with their abuser.

Limitations

As discussed previously,[22] limitations of the quantitative analysis are related to the use of a retrospective administrative dataset not specifically designed for this study, visit- versus patient-level data, and unavailability of certain demographic variables. Those seeking care may have more severe injuries and/or multiple strangulations which could overestimate injuries, while prevalence and injuries may also be underestimated owing to failures of recognizing and/or coding events.

The qualitative sample may have been subject to recall bias, perhaps even more present because of strangulation-related hypoxic brain injury. Medical record documentation could have had omissions or errors. We were limited to record reviews for the study recruitment ED and FNE program, so may have missed pertinent information for those who sought care at another ED first (n=4). One participant declined to provide consent for medical record review, precluding the ability to review them with interview data. Those agreeing to be contacted may have done so because of a positive FNE experience, as the FNE team assisted in obtaining this permission. The FNEs may also have used professional discretion in foregoing mention of the study, respecting the patient's more urgent clinical and emotional care needs, including those requiring hospital admission. Though qualitative data is not designed for generalizability, the study sample was recruited from an ED with an embedded FNE program, and findings may be

dissimilar for EDs without this specialized resource. Findings may also not reflect the experiences of women whose injuries require hospital admission. Additionally, the interviewer (MP) was the primary analyst and, as a nurse with previous professional experience in an ED, this may have unconsciously biased or influenced data interpretation.

Implications for Emergency Nursing

- Nurses, as integral members of the ED team, are critical to the diagnostic process. Having a heightened suspicion for strangulation in women for IPV and asking behavior-specific questions (e.g., did someone apply pressure to your neck?) can inform diagnostic and treatment decisions. Additional training and tools for strangulation assessment are available to support your practice.[28,29,47]
- Symptoms and injuries may provide clues to strangulation, such as neck pain or bruising, but presentations vary, and external injuries may not be readily visible. Women frequently minimize or disregard their strangulation injuries. They may also seek care for mental health concerns, such as increased anxiety, sleep disturbances, or nightmares after a strangulation event. Nurses should specifically assess for these symptoms at the time of ED visit and, if present, share these findings with providers and facilitate subsequent consultation with specialists (e.g., social workers, psychiatrists).
- Thorough, objective documentation of findings can be critical to women's future legal recourse should they choose to pursue it.

- The importance of a trauma-informed approach to care for women surviving strangulation cannot be overemphasized. Your unique nursing ability to connect with patients is, itself, an important form of treatment.

Conclusion

Using the NASEM diagnostic process model, this study contributes to the growing NF-IPS literature by providing common disease and injury codes found in ED visits for the population and rich details of women's experiences seeking ED care after surviving strangulation by their partner. Emergency nursing is strongly positioned to lead clinical practice improvements for NF-IPS patients and to advocate for policies and legislation against this dangerous mechanism of violence. Further research is warranted to expand on this knowledge, particularly in longitudinal cohorts.

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Appendix A: Non-Fatal Strangulation Interview Manual

Emergency Nursing and Health Care Responses to Strangled Women Seeking Care: A Mixed Methods Study of Diagnostic and Treatment Processes

Interview Manual

A study funded in part by the Emergency Nurses Association/Sigma Theta Tau International Research Grant

12.19.17

Contents

The interviewer's first priority during all contacts with participants is to ensure safety.

Scheduling the interview

• A trained study team member ("the interviewer") is responsible for scheduling and conducting the interviews.

• The interviewer will check the secure study folder on JHBox for contact sheets uploaded from the Mercy Medical Center FNE Program up to 3 times per week.

o Once retrieved, the interviewer is responsible for maintaining the confidentiality of the information contained in the contact sheet.

o Contact sheets will be handled per procedure as found on Page 18 of this Manual.

Location of interviews/transportation/privacy

• To ensure privacy and safety, the interviews will be conducted at Mercy Medical Center.

• The $20 the participant receives is intended to compensate for any transportation costs the participant incurs. If transportation is a particular barrier for your participant, the interviewer will consult with the study PI.

• Childcare is not available at the clinics, and it is important that the interviewee has privacy for her interview. Ask interviewee if she can arrange for childcare so she can come alone. If childcare is a particular barrier for participant, and she has an infant under 36 months of age, the infant will be allowed to accompany her during the interview. For those 36 months and older, the interviewer will consult with the study PI.

Telephoning to arrange interview

Advance letters will not be sent to participants.

The following protocol/script will be followed, because an interviewer can never be sure if an abuser is present or enters the room during a phone call, or if an abusive episode is in progress:

• If no one answers and voicemail comes on, do not leave a message if this is one of the first two attempts. If it is the third attempt, leave the following message: "This is (name) from the Johns Hopkins University School of Nursing. Recently, you indicated that we could follow up with you at a later date. If you are still interested in talking us, please call us at 410-955-2778."

• If a male answers the phone, identify yourself by name and say that you're calling for a women's health survey. If the woman is not available, ask for a good time to call back.

• If a woman answers the phone:

o **"This is [name] from the Johns Hopkins School of Nursing. Is this [participant?]**

▪ If "no," ask if participant is available.

▪ If this person insists on taking a message:

• [Participant name] expressed interest in an opportunity we're providing, and I wanted to give her more details. What is a better time to reach her?"

• If this person does not provide a time, ask → **"Would you be able to get a message to her?"**

o If yes, give her the study number 443-287-1582 (or your own, if you're comfortable giving it out)

o If no, ask again for a better time to call.

• Once you finally have confirmed it's the participant:

o **I'm calling about a Women's Health Study. Is this a good time for you to talk?**

▪ If the participants says "YES" → **"Great, do you have privacy right now so I can tell you about an opportunity to meet with a member of our study team after which you would receive a $20 gift card to thank you for your time?"**
• If the participant says "NO" → offer to call back at another time.
• If the participant says "YES" → see below.
▪ If the participant says "NO" to the question of "Is this a good time to talk?" → ask "Are you safe right now?"
▪ If the participant says "NO" → ask "Would you like me to call the police for you? If she says yes, "Are you located at [read address on contact form] right now?" If she says yes, then hang up and do so. Be sure to report this to the study PI immediately.
• If she says no → ask "Is there anything I can do for you?" (If she's says no again, tell her that you will call back in a little while. Follow up within that same day, within a few hours. Report this to the study PI immediately.)
▪ If the participant says "YES" she is safe, but has said it isn't a good time to talk → ask "What would be a better time for me to call and tell you a bit more about why I'm calling?" (Take down the info and follow-up appropriately.)
• If you suspect someone is eavesdropping: you must always be alert, listening for clicks or any other unusual background noise. If you suspect someone is listening in, move immediately to topics regarding women's health that are unrelated to intimate partner violence. Say:
    o "I am now going to ask several questions about your health, to which you should answer yes or no."
▪ Then ask a few questions from below, thank the participant, and terminate the conversation. (The only purpose of these questions is to allay suspicions if an abusive partner is listening in.)
• "Please tell me yes or no whether you've experienced the following problems during the past year:
    o colds/flu
    o difficulty breathing (wheezing, coughing)
    o swollen/painful joints
    o general aches and pains/muscle soreness
    o skin problems (eczema, psoriasis)
• If at any time during the interview the interviewer hears suspicious or angry noises in the background, ask the participant if she wants the interviewer to call the police.
• Do not continue a telephone call with the participant if the participant has excessive hearing or speech difficulties or appears ill, drunk, drugged, or emotionally upset. Document the event.
• If the interviewer has any questions or concerns when contacting or trying to follow up with a participant, she will consult with her program advisor.

Recruiting participants to complete the interview

This should be a natural, comfortable conversation, with the following suggestions:

• The interviewer will remind the participant that she gave permission to be contacted during a recent ED visit, so she remembers who we are. (We're the ones who care about women's health, safety, relationships, and emergency department usage)

• She is one of only 20 participants who was selected for this opportunity to meet with a study member (Make her feel like she's special and important to us. Because she is!).

• We're inviting her to meet with us for a one-on-one conversation about the topics of health, safety, relationships, and emergency department usage. We'll try to keep it brief, but will probably take about 90 minutes.

• She'll receive a $20 gift card after completing the interview.

• We'd like to schedule it at Mercy Medical Center. (Verify that she can get transportation there.)

• This interview, like all her information, will be confidential. We value her privacy, and since there is no childcare at the clinic, it's best to have arrangements for that.

• Schedule a time for the appointment.

• Ask her if she'd like a reminder call before the appointment.

Contacting Secondary contacts

If a participant cannot be located by the info on the contact sheet, try the secondary contact she provided. We are NOT disclosing that our participants are part of a research study.

• "Hi, I'm [name] from the Johns Hopkins School of Nursing. [Participant's name] gave me permission to contact you if I had trouble reaching her. She expressed interest in an opportunity we're providing, and I wanted to give her more details. Would you be able to get a message to her?"

    o You can provide a study team member's phone number for the participant to call back.

    o If the contact will give you the participant's updated info, that's wonderful but we won't push for it. Create notes of anything the contact does share – i.e. she moved out of state, etc

Qualitative interview suggestions

Qualitative interviews with research participants are about description, unique life stories, and context or their natural surroundings and important people who share in their lives.

❖ Qualitative data collecting is best accomplished by a) astute observation skills—also known as participant observation, b) using all your senses, c) comfort in discussing sensitive, private, and often secretive personal topics, d) comfort in a person's home and on their terms, e) receptivity to children's interruptions, and f) being open to the unexpected.

❖ Qualitative data enriches and gives detail to quantitative data.

❖ Qualitative data are recorded in systematic field notes directly after an interview.

Interviewing Tips: DO'S

➢Interviewer is 'the' data collecting instrument.

➢Use participant's words as much as possible.

➢Encourage full description and explanation.

➢Follow through on 'threads' for clearer understanding and full description.

➢Observe and note non-verbal behavior as it 'speaks' volumes.

➢Observe and note a participant's facial expression, behavior, and subtle changes.

➢Silence is okay. Please wait for a participant to formulate her thoughts.

➢Active listening is an attribute of a successful interviewer.

➢A caring listener is a valued resource and emotional fuel.

➢Take descriptive and thorough notes of the contextual milieus (home, neighborhood, and community)

➢In multiple interviews, note changes that occur over time.

➢Probes are wonderful tools to purposefully guide discussion, keep on topic, make subtle transitions, clarify confusing messages, and avoid presumed meanings.

Interviewing Tips: DO'S & DON'TS

➢Do clarify, question, and 'check-out' the true meaning of words.

➢Do not make assumptions.

➢Do use open-ended phrases that encourage discussion as "Tell me more about this." "I'm not sure I understand, please say more or please explain."

➢Do not use 'yes/no' questions.

➢Be flexible, interested, and caring.

➢Be 'in the moment' and present.

➢Do not rigidly follow the interviewing guide or any one format.

Interviewer checklist

□ Digital audio recorder
□ Cell phone
□ Binder w/ referral info, copy of blank consent, etc
□ Interview guide □ Tissues

How to label cassette:
□ Interviewer name, participant number, date of interview
When you begin the audio recording:
□ State your name, the Participant ID#, and the date
Field notes to record, after interview is complete:
□ Interviewer impressions
□ Interviewee demeanor, affect and body language.
    - o Facial expression
    - o Behavior
    - o Subtle changes in behavior
□ Interview setting/privacy/interruptions, etc.

Qualitative Interview Guide:

Time of interview:
Date:
Interviewer:
Participant ID #:
(Brief description of project)
"Thank you so much for meeting with me today. I will be asking questions about the strangulation assault you experienced and your care in the emergency department (ED) afterwards. I'm interested to know more about your interactions with the health care team in the ED: nurses, doctors and other staff. Our discussion today will be confidential, as described in the Informed Consent form. If at any time you'd like to take a few moments to pause, please just let me know. You can also stop the interview at any time. I planned for us to spend about 90 minutes together, but we can go a bit longer or shorter based on how you're feeling and the pace of the interview. Your time is appreciated, and once we've addressed all of the questions, you'll receive a $20 gift card to thank you for participating."
"Because I can't type as quickly as we talk, I'd like to use a voice recorder. This way, I can refer back to it later if I have any questions about what was said. Again, the recording will be kept confidential. I'd like your permission to use this recorder today. Would that be ok?"
"Before we begin, I'd just like to be clear that when I use the word 'strangled' in the questions, I mean someone grabbed your neck with their hands and squeezed, or pushed against your neck with a body part or object. Some people refer to this as 'choking.'"
(Assess for participant understanding)

Questions:

1. Can you tell me about your relationship with the person who strangled you?
    a. Probe 1: Was it your boyfriend, husband, or someone else?
    b. Probe 2: Does that relationship still exist?
    c. Probe 3: Has this person ever strangled you before? If so, how often and what symptoms did you have afterwards?
    d. Probe 4: Was this the first time you had ever been strangled by anyone? If not, did you have symptoms from those other strangulations? (please describe)
2. What do you remember about the assault?
    a. Probe 1: Do you remember being grabbed around your neck or having something pushed against your neck? How many times did that happen during this assault?
    b. Probe 2: What symptoms do you remember having during and after being strangled?
    c. Probe 3: Have those symptoms gone away? If not, which ones are you still having?
    d. Probe 4: Have you noticed any new symptoms that developed after being seen in the emergency department? If so, what are they and have you had them evaluated by a health care professional?
3. Was there something that specifically led you to come to the ED after being strangled?
    a. Probe 1: Were you worried about a particular injury or symptom (e.g. worried

about throat pain)? If so, what?

b. Probe 2: Did someone suggest you seek care? (police, friend, relative, etc.)

c. Probe 3: Did anyone accompany you to the ED?

d. Probe 3: Did you have concerns or worries about seeking care? If so, can you describe them?

4. Describe what happened when you arrived at the ED.

a. Probe 1: Have you ever been to an ED before? If so, for what?

b. Probe 2: What were your expectations about what would happen at this visit?

c. Probe 3: How well do you think the care team met your expectations:

i. When asking you questions?

ii. When performing your physical examination?

iii. When performing tests?

iv. When explaining what they thought your health problems were ("diagnosis") and what they suggested for next steps, other care, and referrals ("treatment")?

d. Probe 4: What did your care team do really well? What responses to your needs did you find most helpful and why?

e. Probe 5: Were there things about the assault that you were reluctant to share with your care team? If so, can you explain?

f. Probe 6: Did you feel safe in the ED? If yes, what helped you feel safe? If not, what prevented you from feeling safe?

g. Probe 7: If there were opportunities for the care team to do a better job, what would you suggest?

5. Tell me what you remember your care team told you about your:

a. Diagnosis/health problems?

b. Risks from this health problems?

c. Treatment or care options?

d. Referrals or other places you should go next for care?

e. When to come back to the ED? (e.g. worsening of particular symptoms)

f. Safety resources?

6. What happened after you left the ED?

a. Probe 1: Which recommendations from the care team did you follow?

b. Probe 2: Which recommendations did you not complete?

c. Probe 3: How did the ED team's approach to your care influence your decisions to follow or not follow their recommendations?

Safety of Data Management:

Physical security of notes, recording devices, and any confidential information
The interviewer is responsible for maintaining the confidentiality of any information in her possession. Be mindful of not leaving items – especially audio recording devices – in cars where they may be broken into.

Providing Compensation:
After the interview, offer the participant a resource sheet.

Participants will be given payment in the form of a gift card that does not identify the woman as a study participant. The gift cards are in the amount of $20. The participant must sign a receipt for the gift card.

Referral Plan:
Safety from abuse: Use your judgment based on the conversation with the participant to guide any follow-up for referrals. A good question to ask is, "Do you feel safe to go home right now?"

If the participant is receptive to help, ask if she'd like you to help her make the call right there.

House of Ruth and Baltimore Domestic Violence Hotline (410) 889 7884
National Domestic Violence Hotline (800) 799 7233 (SAFE)

Care Clinic Care Clinic at the University of Maryland's Department of Pediatrics serves abused and domestic-violence exposed children and families.
520 W. Lombard St.
Gray Hall, 1st Floor
Baltimore, MD 21201

The Care Clinic is a special mental health clinic for children and families who are dealing with the effects of child abuse and exposure to intimate partner violence (IPV; also called domestic violence). We provide several services in a safe and nurturing environment designed to help the healing of our clients.

- Children ages 3 to 18 who have been physically or sexually abused or neglected or have been exposed to IPV
- Siblings and other non-offending family members (e.g. grandparents, aunts, cousins) affected by child maltreatment or exposure to IPV
- Adult victims of IPV with children

Physicians and clients can reach us by phone at 410-706-4869, or by fax at 410-706-3017.
We are a multi-disciplinary team of licensed mental health clinicians specializing in mental health evaluation and treatment of traumatized children and their families. All of our services are free of charge.
We offer:

• individual and family evaluation for treatment (assesses whether a child or family is in need of treatment and, if so, recommendations for the type of treatment and any auxiliary services that are needed)
• individual, play, family, and group psychotherapy
• collaboration/coordination of treatment, where appropriate, with involved agencies/organizations, schools, mental health clinicians, pediatricians, and other professionals
• assistance with travel for clients by providing bus tokens or parking assistance, when needed

After concluding with the participant, the interviewer will log any referrals/phone calls made with the participant, and any outcome.

If a participant discusses suicidal thoughts or past attempts

Begin a dialogue by asking questions. Suicidal thoughts are common with depressive illness and interviewer's willingness to talk about it in a non-judgmental, non-confrontational way can be the help a person needs to seek professional help. Questions okay to ask:

• "Do you ever feel so badly that you think about suicide?'
• "Do you have a plan to commit suicide or take your life?"
• "Have you thought about when you would do it (today, tomorrow, next week)?"
• "Have you thought about what method you would use?"

Asking these questions will help determine if participant is in immediate danger and get help if needed. If it is clear that the participant has a concrete plan including time, place and manner to commit suicide, call the Johns Hopkins University Psychiatric Emergency Department at (410) 955-5964.

Don't try to minimize problems or shame a participant into changing their mind. Interviewer's opinion of a participant's situation is irrelevant. Trying to convince the participant that it is not that bad or that they have everything to live for may only increase their feelings of guilt and hopelessness. Instead, reassure them that help is available, that depression is treatable, and that suicidal feelings are temporary

If participant is not in immediate danger, acknowledge the pain as legitimate and offer to work together to get help. Provide them with the resource sheet which includes the number of the National Lifeline 1-800 273 TALK.

If you or someone you know needs help with a mental crisis...

Baltimore Crisis Response Incorporated • 2041 East Fayette Street • Baltimore, MD 21231
(410) 433-5255 Phone • (410) 433-6795 Fax • (410) 433-5175 Hotline • (410) 433-7050 TDD

Baltimore Crisis Response, Inc. (BCRI) is a helping organization serving Baltimore City for over 16 years.

The mission of BCRI is to provide timely and effective crisis intervention and addictions treatment services in the least restrictive environment possible. Our team of health care professionals responds to emergencies to screen, assess and evaluate the needs of the person. Because a crisis can happen anytime, anywhere, BCRI is equipped to provide crisis intervention services to individuals at home, work or in the community. A "crisis" may be defined in different ways by different people. A person in crisis may be experiencing feelings of depression, suicidal thoughts, and feelings of being out of control or changes in psychological functioning. It is common procedure to make the identification and resolution of the crisis a collaborative effort between BCRI staff, the clients, and their families. These services are currently available 7:00 a.m. to midnight, seven days a week.

After concluding with the participant, the interviewer will log any referrals/phone calls made with the participant, and any outcome.

Mandated Reporting

Under certain circumstances, the possibility of harm to a person must be reported to authorities. There are three such circumstances:

1. Child abuse: Individuals in certain occupations, such as physicians, nurses, teachers, police officers, clergy, and counselors, are required by law to report known or suspected child abuse to child protective services.
2. Imminent harm: Federal law requires that individuals in certain occupations report "imminent threats" to harm someone -- i.e., situations where someone has made a credible threat to do serious bodily harm to another or herself. (This is referred to as the "duty to warn.")
3. Untreated contagious diseases: Anyone with untreated contagious diseases (e.g., AIDS, tuberculosis) be reported to health authorities.

As researchers, we are obligated to report suspected child abuse, untreated contagious diseases, and threats of bodily harm to appropriate authorities. Johns Hopkins University Institutional Review Board also requires us to report such threats to health and safety. Information has been provided below on the types of situations that should be reported. However, it is a matter of judgment, and any concerns will be discussed with the interviewer's program advisor.

Child abuse. No question in the qualitative interview guide asks directly if the participant or offender has abused or is abusing a child. We will suspect child abuse only if the study participant volunteers such information or if the interviewer sees or hears it.

Contagious diseases. There are no specific questions about untreated contagious diseases on the interview and it is highly unlikely that the participant will inform us about one. If, however, she says she has diseases such as tuberculosis, AIDS, or gonorrhea and has not received treatment, the interviewer will report it to the Baltimore City Health Department at (410) 396-4436. The Maryland Department of Health and Mental Hygiene Form 1140 may be used to assist in providing required information over the telephone.

Threats of serious harm. During the interview, the participant may express desires or plans to harm herself, the offender, or another person. The interviewer must use prudent judgment to distinguish between serious, imminent threats of doing great bodily harm that must be reported and statements that simply express some strong threats or feelings. For example, if the participant states, even vehemently, that she's "going to kill him if he hits me again," this may not be a serious, reportable threat. If, however, she says she has bought a gun for the first time, learned to load it, and plans to shoot him when he is released from jail on Monday, the interviewer will report this to appropriate authorities.

Similarly, saying "I wish I were dead" is quite different from "I've been stockpiling my sleeping pills and tonight's the night."

How to explain limits of confidentiality to the participant:

The easiest way to explain the limits of confidentiality to a potential participant is to point out this section of the consent form (section 11) and say “Everything you tell us in the interview is confidential except if you indicate there is child abuse or the risk of child abuse occurring, or you are planning to harm someone – like threatening to kill yourself or someone else, or you have a contagious disease such as tuberculosis.”

Additional note: Even though the interviewer will introduce herself as a researcher, some participants will view her as a nurse. The interviewer will clearly advise participants that she is not able to help directly, can only make referrals and cannot follow up on those referrals. If the interviewer is uncertain if something qualifies for mandated reporting, she will contact her program advisor as soon as possible. The next section provides detailed information on how and when to report suspected cases of child abuse or neglect.

Guidelines and Procedures for Mandated Reporting

As mandated reporters, Maryland Law requires suspected child abuse and neglect is reported and does not require evidence that abuse or neglect has occurred before reporting. If, during an interview, a participant tells the interviewer about ongoing child abuse or child abuse that occurred during the past, she is obligated to report it.

It is possible the interviewer may witness child abuse by a participant or her partner, or overhear accusations about child abuse. However, we are not mandated reporters in this situation. Our mandate is to report when women share such a report with us during our interview only.

When a woman makes such a report during an interview, an oral report should be given immediately to the Baltimore City Child Protective Services (CPS) agency by phone (see contact info below). A written report is also needed and is to be completed within 48 hours after contact that has led the individual to believe that the child has experienced abuse or neglect. The identity of the reporter is kept confidential and the law protects them from civil liability or criminal penalty for making a report in good faith.

Child Abuse or Neglect Occurring in the Past

Mandated reporters are also required to report any occurrence of child abuse or neglect in the past. The main purpose of reporting past abuse is to investigate whether there are current children at risk. The reporter should follow the same procedures for informing CPS as they would for current child abuse and neglect. Such information as in if the victim is an adult when past abuse is revealed, if any known current children are at risk, and if the abuser is believed to be deceased should be included in the report.

Definitions of Child Abuse and Neglect

Child abuse can be defined as non-accidental and physical injury, not necessarily visible, of a child by a parent or the individual with permanent or temporary custody, under circumstances that can indicate that the child’s health or welfare is harmed or at substantial risk of being harmed.

Sexual abuse is one form of child abuse and pertains to an act or acts involving sexual molestation or exploitation, whether physical injuries are sustained or not.
Mental injury is another form of child abuse and it means the observable, identifiable, and substantial impairment of a child's mental or psychological ability to function that is caused by the act of a parent or the individual with custody.
Child neglect can be defined as failure to give proper care and attention to a child including the leaving of a child unattended by the child's parent or an individual who has permanent or temporary care or custody, under circumstances that indicate that the child's health or welfare is harmed or placed at substantial risk of being harmed.
Mental injury, as stated above, is also a form of neglect, due to the failure to give proper care and attention to a child by the child's parent or the individual with custody.

Written Report

A special form (Form 180) should be filled out and faxed to Baltimore City CPS. This form should be included in the packet of materials brought to every interview.
The written report has many elements that are to be filled in. We may only be able to provide CPS with minimal information. Simply fill in as much information as you have. You may ask the participant to help you fill in the form, as discussed below in the section on telling the participant.
Make a copy of the Form 180 for our internal records and note that you need to fill in the name of the person spoken to at CPS when you fill in this form. This is for our internal use only.

Telling the Participant

It is our responsibility to tell the participant when she has given us information that will lead to a report to CPS. Wait until you have ended the interview, paid her, and give her all resource materials before starting this discussion. The interviewer should say something like this:
Before we started the interview, I explained to you that I am a mandated reporter of child abuse. I wanted to let you know that I am required to make a report of child abuse following this interview, based on what you told me about X.
If she tries to tell you the incident was not child abuse, or try otherwise to convince you not to report, you can explain:
I understand your concerns. However, under the guidelines given to me I actually have to report it based on what you said in the interview, even if you don't consider this child abuse. It is not something I can choose not to report at this time.
Be firm, don't get drawn into particulars of her situation – simply state that you have no choice not to report – it is out of your hands.
If she complains about you making a report of past abuse, you can explain to her the goal of the report is just to ensure that children are no longer at risk, and CPS will use the information given to them to determine this (e.g., it is not up to her to determine this).
We will allow her to make the report herself, but only if she does so in front of you. You must dial the phone and speak with the person at CPS first, saying you have someone who would like to make a report. Then hand her the phone. Be sure you are satisfied with the report as given. You must then fill in the written report with her, if she will help you. If she makes the phone call but will not help you with the written report, you still need to make the written report.
You can say:

When we learn about child abuse during an interview, we like to give the person we are talking with the opportunity to make the report themselves. This way, you will be listed as the reporter, and you can give the person at Child Protective Services the most accurate information about what happened. It will be in your own words, and it may be more like what happened than what I might tell them.
If you don't want to make the report yourself, I still need to make the report by phone and I need to fill out this form. Right now, I don't have a lot of information to fill in on the form. If you choose not to share any more with me about this experience, I will just tell them what I know. You are not required to give me any further information, and you should do so only after weighing the personal benefits and risks of sharing this with me, and feeling comfortable about what you decide to share. If you would like to help me fill out the form, then – again – the information they receive will be more accurate.

Actually making the report

If the participant is cooperative and wants to make the report, do the following:

1. Call CPS, and have the participant make the report.
2. Fill in Form 180 together, and tell her you will fax form 180 to CPS.
3. Let her leave.
4. Fax the form to CPS.
5. Make a copy of the Form 180 for our internal records.
6. Alert the PI that a report has been made, via phone or email.

If the participant is cooperative but does not want to make the report:

1. Fill in Form 180 together.
2. Let her leave.
3. Call CPS to make the report verbally.
4. Fax the form to CPS.
5. Make a copy of the Form 180 for our internal records.
6. Alert the PI that a report has been made, via phone or email.

If the participant is uncooperative:

1. Do not push her to help you fill out the form. Thank her again for her valuable time.
2. Let her leave.
3. Fill out Form 180. Be sure to use all information in the interview to fill it in.
4. Call CPS to make the report verbally.
5. Fax the form to CPS.
6. Make a copy of the Form 180 for our internal records.
7. Alert the PI that a report has been made, via phone or email.

Contact information for Baltimore City CPS
Phone: (410) 361-2235 (24 hrs)
Fax: (410) 361-3150
1900 N. Howard St.
Baltimore, MD 21218

Adverse Events

An Adverse Event (AE) is defined by our IRB Committee on Human Research (CHR) as "an unfavorable event associated with a study intervention or other study procedures." There are two types of AEs:

Expected adverse event: An adverse event that is expected, based on previous studies of the intervention, and is described in the consent form, the study protocol or the investigators brochure.

Unexpected adverse event: An adverse event not described in the consent form, study protocol or, for drugs and devices, the investigators brochure. These also include expected adverse events that occur more frequently or are more severe than previously reported.

All anticipated or unanticipated adverse events that occur during an interview should be recorded by the interviewer on an Adverse Event Reporting Form. Anticipated adverse events include any time the participant becomes upset (e.g., crying, asking for a moment to stop the interview for emotional reasons). Unanticipated adverse events during the interview include: the participant choosing to terminate the interview mid-way, the participant becoming extremely emotionally unstable during or after the interview, and any other unusual unforeseen events. During the qualitative interview, unanticipated adverse events include all above events, as well as events in which they believe the perpetrator has become aware of her participation in a domestic violence research study when the participant did not wish him to know, and any other unusual unforeseen events. The interviewer will also document any deviation from protocol, especially if anything may have violated a participant's confidentiality, or anything has occurred that may place her at greater harm.

It is important to document all AEs directly following the interview in which they occur. The AE form should be placed on top of the interview forms when submitted at the end of the day. The interviewer should notify the project director by email or phone to alert her that there is an AE to review for that day. Keeping track of AEs is one way that the CHR ensures that the study does not pose any unexpected risk to the participants.

Confidentiality

All members of the research team are bound by certain legal and moral requirements to safeguard the confidentiality and privacy of the women interviewed. A summary of the regulatory central assurances via 42 USC Section 3789g and 28 CFR Part 22 are provided here.

Personal data collected for a federal government grant must be kept absolutely confidential except for specific situations in which others must be protected and reporting to authorities is required (See "Guidelines and Procedures for Mandated Reporting" below). The participant must be told the purpose of the study, what use will be made of the data, that the information they provide will be confidential, and that participation is voluntary. These requirements are met through the Informed Consent form the participant will sign.

Specific data handling procedures have been developed for this study in accordance with federal law. By adhering to these procedures, you will help ensure that the data are collected in compliance with the law:

Each interview will begin with the Informed Consent procedures citing the purposes and uses of the information, the voluntary nature of the data collection, and explanation of the certificate of confidentiality.
Contact Sheets containing identifying information will be kept separate from the completed instruments, in a secure JHBox folder accessible only to the research team. These Contact Sheets will be kept securely for the required three years following the close of the study, and then shredded.
Information collected results will be stored in a secure location accessible only to the research team.
The interviewer will not discuss any participant's participation, personal information, or answers with anyone outside the research team.
The interviewer will not interview participants known to her.
The interviewer will be talking about personal and difficult topics to participants who may have recently experienced domestic violence. The interviewer acknowledges a moral and ethical duty to people cooperating in the study (or not cooperating) to treat them with respect, handle the information they divulge as privileged, and do her utmost to respect their confidentiality and privacy. She will ask questions a person would not think of asking a close friend, questions that might be thought of as "too personal." Women are willing to answer these personal questions, because the interviewer is seen as a professional, and a stranger, and she promises to keep everything confidential. The interviewer's protection of all information about participants gained during the conduct of research is therefore essential.
We promise participants that we will never reveal what they have told us (except for mandated reporting situations). Their answers will be combined with those of everyone else in the study and the results are reported in group (aggregate) form only. Information collected during the study can be shared only with the research team, whose members are under the same legal and ethical duty to the people interviewed as the interviewer.
IT IS THE INTERVIEWER'S DUTY TO KEEP THE PROMISE OF CONFIDENTIALITY. NEVER TELL FACTS ABOUT, OR REVEAL THE ANSWERS OF, ANYONE SHE INTERVIEWS.
The interviewer will only discuss cases or a person she has interviewed with other members of the research team. She may also discuss personal reactions with your personal therapist or pastoral counselor, because they are also bound by confidentiality. For particularly difficult cases, the interviewer will consult with her program advisor.

Certificate of Confidentiality & Confidentiality Pledge

Certificates of Confidentiality are issued by the National Institutes of Health (NIH) and other DHHS agencies to protect the confidentiality of information obtained from research subjects. They do this by protecting investigators and institutions from being compelled to release information about research subjects that is considered privileged because it is sensitive and identifiable. Certificates thus help to achieve the research objectives, promote participation in studies by assuring privacy to subjects, and ensure that subjects will not be harmed as a result of their research participation. A Certificate does not, however, take the place of good data security or clear policies and procedures for data protection, which are always essential to protect the privacy of research subjects.

Protections Afforded by a Certificate
Certificates are issued to the institutions or universities where the research is conducted. Except as described below, they allow an investigator and others who have access to research records to refuse to disclose identifying information in any civil, criminal, administrative, legislative, or other proceeding, whether at the federal, state, or local level.

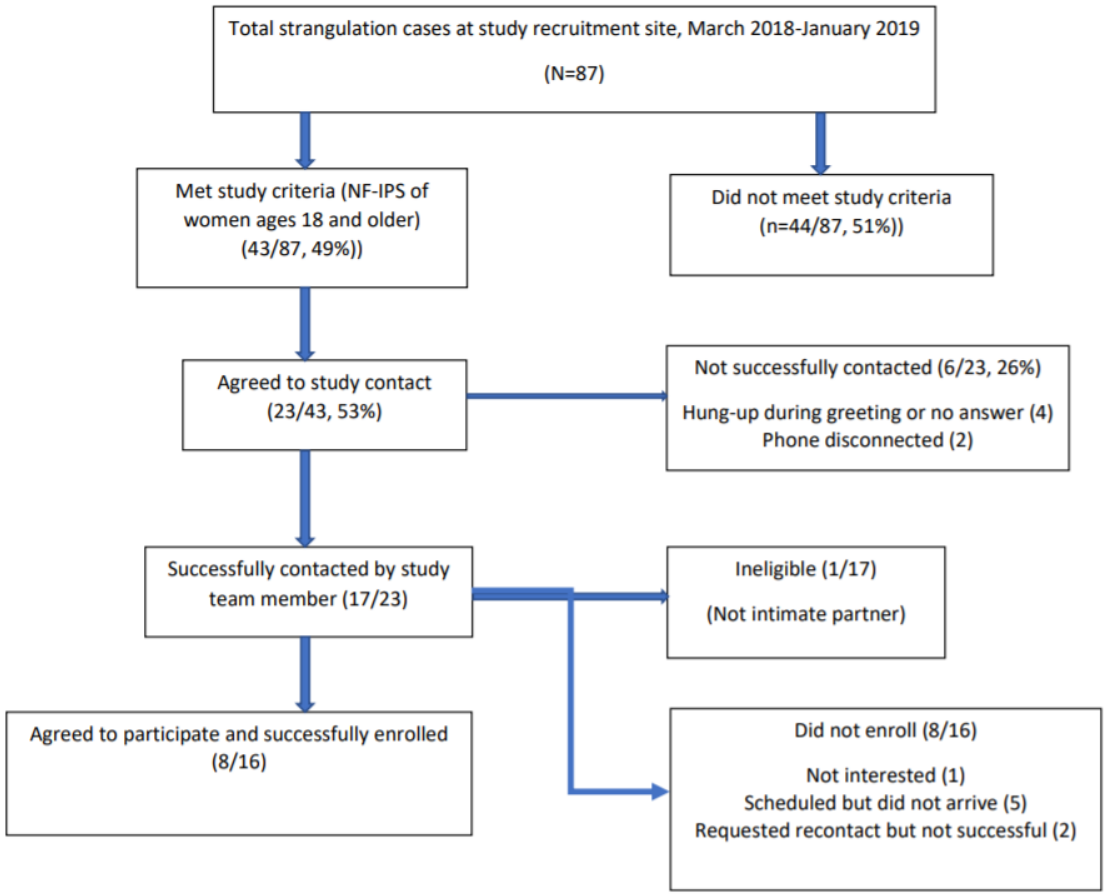
While Certificates protect against involuntary disclosure, subjects may voluntarily disclose, or request investigators to disclose, their research data or information. Subjects may, for example, authorize the investigator in writing to release the information to physicians, insurers, employers, or other third parties. In such case, researchers may not use the Certificate to refuse disclosure.

Certificates do not, however, authorize researchers to refuse to disclose information about subjects if authorized DHHS personnel or authorized JHSON reviewers request such information for an audit or program evaluation. Neither can researchers refuse to disclose such information if it is required to be disclosed by the Federal Food, Drug, and Cosmetic Act.

Confidentiality Pledge
The interviewer will sign a confidentiality pledge. In signing this pledge, the interviewer agrees not to divulge the identity of any study participant outside of the study team, nor discuss the particularities of any woman's story with anyone outside the study team. This is to protect the privacy of the participant.

If the interviewer sees a participant outside the research setting, she will not approach her and begin talking. This is order to protect her anonymity. In order not to be rude, the interviewer may smile at her or say hello if it seems comfortable. However, it is advised to be cautious. There is no way for the interviewer to know if her abuser is near. If the interviewer and participant begin talking, he may press her or the interviewer to tell him how they know each other. On the other hand, if she approaches the interviewer and wants to talk to the interviewer about the study, that is fine. The interviewer must suggest going to a private place to do so if possible.

Appendix B: Study Enrollment Details



Appendix C: Codebook

L1	L2	L3		Code	Description	Examples
1				**Patient Experiences a Health Problem (i.e. intimate partner strangulation or IPS)**	**Understanding of IPS event**	
	1.1			Abuse Context	Description of circumstances that form the setting for the event prompting study referral, allowing it to be understood and assessed.	
		1.1a		Relationship Description	Participant's description of the relationship she has/had with the person who strangled her.	"Well, he-- I wouldn't say we really been together because it wasn't, like, a boyfriend-girlfriend relationship. We've been friends, but he said that he liked me and I-- and he asked did I like him? We were trying to get to that point. So we were just pretty much friends, but we were intimate."
		1.1b		Abuse History	Description of any past history of abuse.	
			1.1b1	Past Abuse: Current/Most Recent Partner	Description of past abuse by same partner who was involved in event that led to ED care prompting study referral.	"But a week—it was a week before that that he started—that he bruised my face up really bad and I couldn't leave."
			1.1b2	Past Abuse: Previous Partners	Description of past abuse by different partners than the individual involved in event that led to ED care prompting study referral.	"I always dated assholes. I liked the bad boys….I'm sure some verbal stuff happened. I'm sure that there was some degrading and not making me feel so great, but no one has ever raised a hand to me or has done what he's done."
			1.1b3	Past Abuse: By Family member	Description of past abuse by a family member (non-partner).	"I have been through sexual abuse with my own (relative) for six years, from three to nine years old, and abused, period, with my own (relatives)."

L1	L2	L3		Code	Description	Examples
			1.1b4	Past Abuse Injuries	Description of injuries sustained from any abuse prior to event prompting study referral.	"They saw that it was two old fractures under my left eye and there was one old fracture of my nose."
		1.1c		Strangulation History		
			1.1c1	Past Strangulation: Current /Most Recent Partner	Description of past strangulation by same partner who was involved in event that led to ED care prompting study referral.	"Maybe more than 20." (Response to question: "So how many times do you think he's strangled you?")
			1.1c2	Past Strangulation: Previous Partners	Description of past strangulation by different partners than the individual involved in event that led to ED care prompting study referral.	"No. This is the first and last relationship that someone has been putting their hands on me." (responding to question: "Have you ever been with someone who's strangled you other than him?")
			1.1c3	Past Strangulation Injuries	Description of injuries sustained from any strangulation prior to event prompting study referral.	"The next day, my neck would hurt. My body's always in pain after each altercation with him."
		1.1d		Escaping the Situation	Participant's description of being able to escape the abusive event that led to the ED visit prompting study referral.	"So I was able to pack everything that I could get and I left. And he lives across the street from a shopping center, which is in [ANONYMIZED]. So he lives right across the street from [ANONYMIZED] and they have an Applebee's there also, outside of the mall. And that's where I went, to the (restaurant), and I called my (relative) to come and get me. And she came and got me."
1		1.1e		Rationale Reflections	Participant's reflections on her beliefs regarding reasons for abuse/events.	"So he said he blacked out, but he remembers certain things that happened before and afterwards. But maybe he blacked out and I feel like he remembers, but-- maybe he did black out because has been through issues also. But I'm not

L1	L2	L3		Code	Description	Examples
						trying to put that as an excuse for him. I'm just saying that that's what he told me he has. He has memory loss and things like that. But he's very aggressive and he can be very disrespectful."
		1.1f		Past Medical/Surgical/ Social History	Description of any medical, surgical or social history that participant mentions but does not directly attribute to abuse.	"My chest will hurt constantly...I've had that problem for a long time. So it didn't just come from the assault."
		1.1g		Support Systems	Description of participant's established support systems (people, programs, places they feel are safe).	"Like, my (relative) isn't-- she's going to see me for who I really am, and I'm not a bad person. But she is-- my (relative), she's the one that went to the house and came and got me from school."
	1.2			Description of Current IPS Event	Participants provide a description of the IPS experience leading to this ED visit in their own words.	"But during that time, he-- at one point, he strangled me to the point where I almost passed out. I was gasping so much for air. And I have shortness of breath, so I could have run out like that <snaps fingers> and either been unconscious or died for that matter. So—"
	1.3			Signs/Symptoms of IPS	Participant's description of signs/symptoms she attributes to strangulation that developed from the abusive event prompting the ED visit and study referral.	"My throat was very sore. Well, right now, it's sore. I feel discomfort in my throat and last night, me and my (relative) were in a store and it felt like a vein or something had pulled or something like that. It was a weird feeling, but I don't know what it was, but it didn't do it again. That was the only time that it did it. But pretty much on and off, my throat has been sore."
	1.4			Reason for Seeking Health Care	Participants' descriptions of drivers/catalysts/reasons for seeking emergency	"I called my (relative) to come and get me. And she came and got me. While we were in the car, I showed her my face and

L1	L2	L3		Code	Description	Examples
					health care after event including IPS.	she stopped the car and she just cried and she took me to [ANONYMIZED].”
2				**Patient Engages with Health Care System**	**Participant/staff interactions on arrival to ED**	
	2.1			Physical Arrival to ED	Participants' mode of arrival to the ED (e.g., by police, family, EMS), selection of ED, transfer from another ED.	“Well, like I said, I-- my (relative) took me. She said, 'I'm taking you to [ANONYMIZED].' That's what she did.”
	2.2			Expectations for Care	Participants' recounting of previous ED experiences, what was expected when arriving for this ED visit, and how well the ED team met these expectations.	“Just normal treatment, basically. I'm pretty sure there was going to be tests ran and things like that. And I'm pretty--and I knew that I was going to be talking to police officers.”
		2.2.a		Positive Achievement of Expectations	Participants' descriptions of what the ED team did well; what responses to participant needs were found most helpful and why.	“So she did the exam. I think she did it very well.”
		2.2.b		Reluctance to Share	Any details about the assault that participant was reluctant to share with the care team and why (e.g. what were her worries if she revealed that info? What did she expect might happen that caused her pause?).	“No.” (Responding to question: “Were you worried about going to talk to someone and getting care?”)
		2.2.c		Safety in the ED	Did participants feel safe in the ED? Why or why not?	“Me and my (relative), we saw the security guard sitting there and he-- we let him know, just in case he did go up there. I notified what he might look like if he went up there. And so, I think from there, he called the police, or maybe the lady that was sitting at the front desk called the police.”
		2.2.d		Failure to Fully Meet Expectations	Participants' descriptions of what the ED team did not do well; opportunities for the team to improve.	“The service was-- it took a while for her to come, but it was-- other than that, it was fine, everything.”

L1	L2	L3		Code	Description	Examples
3				**Information Gathering, Information Integration & Interpretation**	**Collecting sufficient information regarding abusive event, including strangulation, integrating the information and interpreting the information to determine diagnosis.**	
	3.1			Clinical History and Interview		
		3.1a		Participant Perspective--Clinical History/Interview	What participant remembers regarding clinical history/interview and chief complaint.	"I told them that he strangled me."
		3.1b		Staff Documentation--Clinical History/Interview	What staff documented regarding clinical history/interview and chief complaint.	"The patient notes that she has been having difficulties with her significant other whom she was living with, notes that she has gotten police involved on multiple occasions and at one point days ago, he became angry at her and choked with his hands."
	3.2			Physical Exam		
		3.2a		Participant Perspective--Physical Exam	What participant remembers regarding the physical assessment/examination.	"And she checked for bruises and things like that."
		3.2b		Staff Documentation--Physical Exam	What staff documented regarding the physical assessment/examination.	"Upon arrival in the department, no acute cardiac or respiratory distress. The patient has obvious old ecchymosis. No evidence of proptosis. Does have subconjunctival hemorrhage. No hyphema present. Intact extraocular movements and normal vision per pt."
	3.3			Diagnostic Testing		
		3.3a		Participant Perspective--Diagnostic Testing	What participant remembers about any diagnostic testing done (e.g. laboratory tests, imaging).	"And like I said, there they did two CAT scans of my head and my face and that's when they found the old fractures."

L1	L2	L3		Code	Description	Examples
		3.3b		Staff Documentation--Diagnostic Testing	What staff documented regarding diagnostic testing ordered/performed.	"Imaging that was performed was reviewed, included CT head and maxillofacial, showed old L orbital floor fractures and old L nasal sided mandibular fracture."
	3.4			Referral and Consultation		
		3.4a		Participant Perspective--Consultation	What participant remembers about any ancillary/specialty consultations during her ED visit	"And then another woman came in to help me just with paperwork and telling me that I should probably get protection, get help."
		3.4b		Staff Documentation--Consultation	What staff documented regarding any ancillary/specialty consultations during participant's ED visit.	"Advocate is actively attempting to find housing for the patient."
	3.5			Information Integration and Interpretation	Documentation by health care team synthesizing information gathered.	"At this point, I do not see benefit to further imaging as she is overall well appearing."
4				**Communication of Diagnosis**	**The explanation of the health problem (i.e. IPS) that is communicated to the participant**	
	4.1			Participant Perspective--Diagnosis/Health Problem	What participant remembers the ED team told her about her diagnosis/health problem and/or risks to her health related to strangulation.	"I know the doctor-- it starts with the aid. She said-- because my eye was really bloodshot red on this side. So it's called, like, hemmingroid [ph?] or something like that?"
	4.2			Staff Documentation--Diagnosis/Health Problem	What staff documented regarding diagnosis and medical decision making, as well as any health-associated risks related to strangulation.	"Final diagnosis: Domestic violence of adult, initial encounter."
5				**Treatment**	**The planned path of care based on the diagnosis**	
	5.1			Clinical Treatment		
		5.1a		Participant Perspective--Treatment/Care Options	What participant remembers about treatment/care options offered to her based on diagnosis/health problem.	"They didn't give me--they didn't prescribe me with any medicine or anything."

L1	L2	L3		Code	Description	Examples
		5.1b		Staff Documentation--Treatment/Care Options	What staff documented regarding treatment/care options offered to participant based on diagnosis/health problem.	"Tylenol given po; comfort measures and wound care education provided."
	5.2			Safety Planning		
		5.2a		Participant Perspective--Safety Planning	What participant remembers about any discussions staff had with her about safety plans after discharge, safety resources available, etcetera.	"I think they had all the information that I needed on there."
		5.2b		Staff Documentation--Safety Planning	What staff documented regarding safety planning for discharge, safety resources available, etcetera.	"Her children are currently with her (relative) whom she endorses she will be staying with as her safety plan."
	5.3			Follow-up care		
		5.3a		Participant Perspective--Follow-up Care	What participant remembers about referrals or other follow-up care recommendations.	"But the people that I needed to call, like for counseling and things like that, that was pretty much what I needed to follow up with."
		5.3b		Staff Documentation--Follow-up Care	What staff documented about referrals or other follow-up care recommendations.	"Pt advised to follow up with her primary care physician if she has any changes in vision and to follow discharge instructions."
	5.4			Discharge Teaching	Including signs/symptoms that, if develop/persist, the patient should return for additional emergency care.	
		5.4a		Participant Perspective--Discharge Teaching	What participant remembers about discharge teaching/instructions.	"Because I was tired of being in the hospital for that long. I just wanted to leave, pretty much. But I still felt like I should have asked questions and I didn't really look at it until I left the hospital. But I still should have went through everything to make sure that I understand what the results are."

L1	L2	L3		Code	Description	Examples
		5.4b		Staff Documentation--Discharge Teaching	What staff documented regarding discharge teaching/instructions.	"Pain management plan/medication regimen after d/c, follow up care discussed. D/C instructions reviewed with pt who verbalizes understanding. Printed copy given to pt."
6				**Outcomes**	**Patient and System Outcomes: Learning from diagnostic errors, near misses, and accurate, timely diagnoses**	
	6.1			Post-Discharge Follow-Up		
		6.1a		Completed Recommendations	Which recommendations from the ED team did the participant follow/complete?	"And I have also found me a primary care physician, which is good. So that's always good."
		6.1b		Plans to Complete Recommendations	Which recommendations from the ED team does the participant plan to follow/complete?	"No. I actually have an appointment coming up with (therapist) this week, but I haven't seen her since."
		6.1c		Does Not Plan to Complete Recommendations	Which recommendations from the ED team does the participant plan not to follow/complete?	"I've been really busy with work back and forth, like the commute on the bus and stuff is really long, coming from all the way out on (anonymized) to go all the way to (anonymized). So I've been kind of tired. I haven't called. I haven't had any more symptoms, so I wasn't really too worried because I did have a treatment here."
	6.2			Influence of ED Team on Post-Discharge Decisions	How ED team's approach to care influenced the participant's decisions to follow, or not follow, their recommendations.	"Well, the main thing is they said don't go back to [ANONYMIZED] and I explained to them that I won't be going back this time. And not only that, I had my own mind of going back to counseling for this. So that was pretty much it."
	6.3			Other Important Information	Any other information the participant thinks would be helpful for the	"No, just that the people were wonderful and that I really hope something

L1	L2	L3		Code	Description	Examples
					ED team to know that may not have been asked.	happens with the nurse that helped me. I would love to see something happen. She's so wonderful."
	6.4			Patient Disposition	Per medical records, patient disposition (admitted, transferred, discharged).	"D/C from Urgent Care to SAFE RN. D/C from SAFE to home with (relatives)."

Appendix D: ICD-9-CM and CPT Codes

Neurologic and Sense Organs (320-389)	
348.30	Encephalopathy not otherwise specified (NOS)
348.39	Encephalopathy not elsewhere classifiable (NEC)
348.8	Brain conditions not elsewhere classifiable (NEC)
348.89	Brain conditions not elsewhere classifiable (NEC)
372.72	Conjunctival hemorrhage
372.73	Conjunctival edema
374.82	Edema of eyelid
379.90	Eye disorder not otherwise specified (NOS)
379.91	Pain in or around eye
379.92	Swelling or mass of eye
379.93	Redness/discharge of eye
384.20	Perforated tympanic membrane
388.11	Acoustic trauma
388.30	Tinnitus not otherwise specified (NOS)
388.32	Objective tinnitus
388.70	Otalgia not otherwise specified (NOS)
388.71	Otogenic pain
Circulatory (390-459)	
433.10	Occluded carotid artery without infarction
433.11	Occluded carotid artery with infarction
433.20	Occluded vertebral artery without infarction
433.30	Occluded multiple bilateral artery without infarction
433.80	Occluded specific artery without infarction
434.91	Stroke; ischemic neurologic deficit; brain infarct/infarction
Musculoskeletal System and Connective Tissue (710-739)	
723.1	Cervicalgia; neck pain
723.4	Brachial neuritis not otherwise specified (NOS)
723.5	Torticollis not otherwise specified (NOS)
723.8	Cervical syndrome not elsewhere classifiable (NEC)
723.9	Neck disorder/symptom not otherwise specified (NOS)
General (780)	
780.01	Coma
780.02	Trans alter awareness

780.09	Other alteration of consciousness
780.2	Syncope and collapse (includes transient loss of consciousness)
780.33	Post traumatic seizures
780.39	Convulsions not elsewhere classifiable (NEC)
780.4	Dizziness; lightheadedness
780.93	Memory loss; amnesia
780.97	Altered mental status
Symptoms Involving Nervous and Musculoskeletal Systems (781)	
781.2	Abnormality of gait
781.3	Lack of coordination
781.94	Facial droop/weakness
781.99	Nervous/musculoskeletal symptom not elsewhere classifiable (NEC)
Symptoms Involving Skin and Other Integumentary Tissue (782)	
782.2	Local superficial swelling
782.3	Edema
782.7	Spontaneous ecchymoses (includes petechiae)
782.9	Integument tissue symptom not elsewhere classifiable (NEC)
Symptoms Involving Head and Neck (784)	
784.0	Headache
784.1	Throat pain; laryngeal pain
784.2	Swelling, mass or lump in head and neck
784.3	Aphasia
784.40	Voice/resonance disturbance not otherwise specified (NOS)
784.42	Dysphonia
784.49	Voice/resonance disturbance not elsewhere classifiable (NEC)
784.5	Speech disturbance not elsewhere classifiable (NEC)
784.51	Dysarthria
784.59	Speech disturbance not elsewhere classifiable (NEC)
784.7	Epistaxis
784.9	Symptom involving head/neck not elsewhere classifiable (NEC)

784.92; 526.9 prior to 10/2010	Jaw pain
784.99	Head & neck symptoms not elsewhere classifiable (NEC)
Symptoms Involving Respiratory System and Other Chest Symptoms (786)	
786.01	Hyperventilation
786.05	Shortness of breath
786.06	Tachypnea
786.07	Wheezing
786.09	Respiratory abnormality not elsewhere classifiable (NEC)
786.1	Stridor
786.2	Cough
786.3	Hemoptysis
786.30	Hemoptysis not otherwise specified (NOS)
786.39	Hemoptysis not elsewhere classifiable (NEC)
786.50	Chest pain not otherwise specified (NOS)
786.52	Painful respiration
786.59	Chest pain not elsewhere classifiable (NEC)
786.9	Respiratory system/chest symptom not elsewhere classifiable (NEC)
Symptoms Involving Digestive System (787)	
787.2	Dysphagia
787.20	Dysphagia not otherwise specified (NOS)
787.29	Dysphagia not elsewhere classifiable (NEC)
787.6	Incontinence of feces
787.60	Full incontinence-feces
Symptoms Involving Urinary System (788)	
788.30	Urinary incontinence not otherwise specified (NOS)
788.39	Other urinary incontinence
Other Ill-Defined and Unknown Causes of Morbidity and	

Mortality (797-799)	
799.01	Asphyxia
799.02	Hypoxemia
799.2	Nervousness
799.21	Nervousness
799.29	Emotional state symptom not elsewhere classifiable (NEC)
799.3	Debility not otherwise specified (NOS)
799.89	Ill-define condition not elsewhere classifiable (NEC)
Injury and Poisoning (800-959)	
807.5	Closed fracture of larynx and trachea
850.0	Concussion w/o coma
850.11	Concussion-brief coma <31 minutes
850.12	Concussion-brief coma 31-59 minutes
850.2	Concussion-moderate coma
850.3	Concussion-prolong coma
850.4	Concussion-deep coma
850.5	Concussion with coma not otherwise specified (NOS)
850.9	Concussion not otherwise specified (NOS)
852.00	Traumatic subarachnoid hemorrhage
852.01	Subarachnoid hemorrhage-no coma
852.02	Subarachnoid hemorrhage-brief coma
852.20	Traumatic subdural hemorrhage
852.21	Subdural hemorrhage without coma
852.22	Subdural hemorrhage without coma
852.24	Subdural hemorrhage prolonged coma
852.25	Subdural hemorrhage-deep coma
852.26	Subdural hemorrhage-coma not otherwise specified (NOS)
852.29	Subdural hemorrhage-concussion
852.40	Traumatic extradural hemorrhage
852.46	Extradural hemorrhage coma not otherwise specified (NOS)
853.00	Traumatic brain hemorrhage not elsewhere classifiable (NEC)
853.01	Brain hemorrhage not elsewhere classifiable (NEC) w/o coma
853.02	Brain hemorrhage not elsewhere classifiable (NEC)-brief coma
853.06	Brain hemorrhage not elsewhere classifiable (NEC)-coma not otherwise specified (NOS)
854.00	Brain injury not elsewhere classifiable (NEC)
854.01	Brain injury not elsewhere classifiable (NEC)-no coma
854.02	Brain injury not elsewhere classifiable (NEC)-brief coma

854.06	Brain injury not elsewhere classifiable (NEC)-coma not otherwise specified (NOS)
854.09	Brain injury not elsewhere classifiable (NEC)-concussion
900.01	Injury common carotid artery
900.03	Injury internal carotid artery
900.1	Injury internal jugular vein
900.81	Injury external jugular vein
900.82	Injury multiple head/neck vessels
900.89	Injury head/neck vessel not elsewhere classifiable (NEC)
900.9	Injury head/ not elsewhere classifiable (NEC) vessel not otherwise specified (NOS)
910.0	Abrasion head
910.8	Superficial injury head not elsewhere classifiable (NEC)
920	Contusion face, scalp, neck except eye(s)
921.0	Black eye not otherwise specified (NOS)
921.1	Contusion periocular
921.2	Contusion orbital tissue
921.3	Contusion of eyeball
921.9	Contusion of eye not otherwise specified (NOS)
925.2	Crush injury neck
959.01	Head injury not otherwise specified (NOS)
959.09	Face & neck injury
959.8	Injury multiple site/site not elsewhere classifiable (NEC)
959.9	Injury-site not otherwise specified (NOS)
Imaging CPT Codes (CPT1-15)	
70450	CT brain without contrast
70460	CT brain with contrast
70470	CT brain with and without contrast
70490	CT soft tissue neck without contrast
70491	CT soft tissue neck with contrast
70492	CT soft tissue neck with and without contrast
70498	Computed tomographic angiography, neck, with contrast material(s), including non-contrast images, if performed, and image post-processing
70543	MRI neck, orbit with and without contrast
70547	MRA neck without contrast
72040	X-ray cervical spine 2-3 views
72050	X-ray cervical spine 4-5 views
72052	X-ray cervical spine 6 or more views
72125	CT cervical spine without contrast
72126	CT cervical spine with contrast

72141	MRI cervical spine without contrast
72156	MRI cervical spine with and without contrast
76536	Ultrasound head and neck soft tissue
93880	Duplex scan of extracranial arteries
Imaging ICD Procedure Codes	
8703	CT head
8709	Head soft tissue x-ray not elsewhere classifiable (NEC)
8722	Cervical spine x-ray not elsewhere classifiable (NEC)
8871	Diagnostic ultrasound-head/neck
Total imaging (CPT + ICD)	(Reported in Table 4.2)
Sub-category of Injury: Concussion/Brain Injury	
850.0	Concussion without coma
850.11	Concussion-brief coma <31 minutes
850.12	Concussion-brief coma 31-59 minutes
850.2	Concussion-moderate coma
850.3	Concussion-prolonged coma
850.4	Concussion-deep coma
850.5	Concussion with coma not otherwise specified (NOS)
850.9	Concussion not otherwise specified (NOS)
854.00	Brain injury not elsewhere classifiable (NEC)
854.01	Brain injury not elsewhere classifiable (NEC)-no coma
854.02	Brain injury not elsewhere classifiable (NEC)-brief coma
854.06	Brain injury not elsewhere classifiable (NEC)-coma not otherwise specified (NOS)
854.09	Brain injury not elsewhere classifiable (NEC)-concussion
Sub-category of Injury: Internal Injury	
807.5	Closed fracture of larynx and trachea
850.0	Concussion without coma
850.11	Concussion-brief coma <31 minutes
850.12	Concussion-brief coma 31-59 minutes
850.2	Concussion-moderate coma
850.3	Concussion-prolong coma
850.4	Concussion-deep coma
850.5	Concussion with coma not otherwise specified (NOS)
850.9	Concussion not otherwise specified (NOS)

852.00	Traumatic subarachnoid hemorrhage
852.01	Subarachnoid hemorrhage-no coma
852.02	Subarachnoid hemorrhage-brief coma
852.20	Traumatic subdural hemorrhage
852.21	Subdural hemorrhage without coma
852.22	Subdural hemorrhage without coma
852.24	Subdural hemorrhage prolonged coma
852.25	Subdural hemorrhage-deep coma
852.26	Subdural hemorrhage-coma not otherwise specified (NOS)
852.29	Subdural hemorrhage-concussion
852.40	Traumatic extradural hemorrhage
852.46	Extradural hemorrhage coma not otherwise specified (NOS)
853.00	Traumatic brain hemorrhage not elsewhere classifiable (NEC)
853.01	Brain hemorrhage not elsewhere classifiable (NEC) w/o coma
853.02	Brain hemorrhage not elsewhere classifiable (NEC)-brief coma
853.06	Brain hemorrhage not elsewhere classifiable (NEC)-coma not otherwise specified (NOS)
854.00	Brain injury not elsewhere classifiable (NEC)
854.01	Brain injury not elsewhere classifiable (NEC)-no coma
854.02	Brain injury not elsewhere classifiable (NEC)-brief coma
854.06	Brain injury not elsewhere classifiable (NEC)-coma not otherwise specified (NOS)
854.09	Brain injury not elsewhere classifiable (NEC)-concussion
900.01	Injury common carotid artery
900.03	Injury internal carotid artery
900.1	Injury internal jugular vein
900.81	Injury external jugular vein
900.82	Injury multiple head/neck vessels
900.89	Injury head/neck vessel not elsewhere classifiable (NEC)
900.9	Injury head/neck vessel not otherwise specified (NOS)
Sub-category of Injury: External Injury	
910.0	Abrasion or friction burn of face, neck, and scalp except eye, without mention of infection
910.8	Superficial injury head neck, and scalp, without mention of infection
920	Contusion face, scalp, neck except eye(s)
921.0	Black eye not otherwise specified (NOS)
921.1	Contusion periocular
921.2	Contusion orbital tissue
921.3	Contusion of eyeball

921.9	Contusion of eye not otherwise specified (NOS)
925.2	Crush injury neck
959.01	Head injury not otherwise specified (NOS)
959.09	Face & neck injury
959.8	Injury multiple site/site not elsewhere classifiable (NEC)
959.9	Injury-site not otherwise specified (NOS)
Mental Disorders	
307.81	Tension headache
308.0	Predominant disturbance of emotions
308.3	Other acute reactions to stress
308.4	Mixed disorders as reaction to stress
308.9	Unspecified acute reaction to stress
311	Depressive disorder, not elsewhere classifiable (NEC)
Thyroid	
242.80	Thyrotoxicosis of other specified origin without mention of thyrotoxic crisis or storm
242.90	Thyrotoxicosis without mention of goiter or other cause, and without mention of thyrotoxic crisis or storm
242.91	Thyrotoxicosis without mention of goiter or other cause, with mention of thyrotoxic crisis or storm
246.8	Other specified disorders of thyroid
246.9	Unspecified disorder of thyroid
Principal CCS Diagnosis Groups	
239	Superficial injury-contusion
244	Other injuries
232	Sprains and strains
181	Other complications of pregnancy
205	Spondylosis
235	Open wounds head/neck/trunk

Appendix E: Interview Questions and Medical Record Data Elements by Diagnostic Process Model[30] Section

NASEM Model Section	Related Interview Questions and Possible Probes	Medical Record Data Elements
"Patient Experiences a Health Problem"	1. Can you tell me about your relationship with the person who strangled you? a. Probe 1: Was it your boyfriend, husband, or someone else? b. Probe 2: Does that relationship still exist? c. Probe 3: Has this person ever strangled you before? If so, how often and what symptoms did you have afterwards? d. Probe 4: Was this the first time you had ever been strangled by anyone? If not, did you have symptoms from those other strangulations? (please describe) 2. What do you remember about the assault? a. Probe 1: Do you remember being grabbed around your neck or having something pushed against your neck? How many times did that happen during this assault? b. Probe 2: What symptoms do you remember having during and after being strangled? c. Probe 3: Have those symptoms gone away? If not, which ones are you still having? d. Probe 4: Have you noticed any new symptoms that developed after being seen in the emergency department? If so, what are they and have you had them evaluated by a health care professional?	N/A
"Patient Engages with Health Care System"	3. Was there something that specifically led you to come to the ED after being strangled? a. Probe 1: Were you worried about a particular injury or symptom (e.g. worried about throat pain)? If so, what? b. Probe 2: Did someone suggest you seek care? (police, friend, relative, etcetera)	Days elapsed from assault to ED presentation Triage level Mode of arrival Accompanied by

	c. Probe 3: Did anyone accompany you to the ED? d. Probe 3: Did you have concerns or worries about seeking care? If so, can you describe them?	Seen at outside hospital (OSH) first?
"Information Gathering, Integration, Interpretation"	4. Describe what happened when you arrived at the ED. a. Probe 1: Have you ever been to an ED before? If so, for what? b. Probe 2: What were your expectations about what would happen at this visit? c. Probe 3: How well do you think the care team met your expectations?: i. When asking you questions? ii. When performing your physical examination? iii. When performing tests? iv. When explaining what they thought your health problems were ("diagnosis") and what they suggested for next steps, other care, and referrals ("treatment")? d. Probe 4: What did your care team do really well? What responses to your needs did you find most helpful and why? e. Probe 5: Were there things about the assault that you were reluctant to share with your care team? If so, can you explain? f. Probe 6: Did you feel safe in the ED? If yes, what helped you feel safe? If not, what prevented you from feeling safe? g. Probe 7: If there were opportunities for the care team to do a better job, what would you suggest?	Clinical history/interview • Abuse history • Assault/strangulation description • Symptoms/injuries reported by patient Physical exam Nursing assessments and findings Provider orders Diagnostic testing Consultation notes Medical decision making
"Communication of Diagnosis, Risks, Treatment Options"	5. Tell me what you remember your care team told you about your: a. Diagnosis/health problems? b. Risks from this health problems? c. Treatment or care options? d. Referrals or other places you should go next for care? e. When to come back to the ED? (e.g. worsening of particular symptoms)	Clinical impression Final diagnoses Progress/treatment notes Discharge instructions

	f. Safety resources?	
"Outcomes"	6. What happened after you left the ED? a. Probe 1: Which recommendations from the care team did you follow? b. Probe 2: Which recommendations did you not complete? c. Probe 3: How did the ED team's approach to your care influence your decisions to follow or not follow their recommendations?	N/A

Table 4.2. Co-Occurring ICD-9-CM Codes, ED Visits by Women Ages 18+ with ICD-9-CM IPV Code, Nationwide Emergency Department Survey (NEDS) 2006-2014 (weighted)

ICD Grouping Category	Total IPV visits (%, 99% CI)	IPV, without strangulation code (%, 99% CI)	IPV, with strangulation code (%, 99% CI)	p-value[a]
Neurologic and Sense Organs	2.08 (1.89-2.28)	2.07 (1.88-2.27)	3.11 (1.59-5.99)	0.12
Musculoskeletal System and Connective Tissue	4.50 (4.17-4.87)	**4.37 (4.04-4.72)**	**15.65 (11.63-20.73)**	**<0.01**
General	2.45 (2.22-2.69)	**2.41 (2.19-2.66)**	**5.42 (3.48-8.37)**	**<0.01**
Symptoms Involving Head and Neck	8.25 (7.57-8.99)	**8.18 (7.51-8.92)**	**13.60 (10.15-17.99)**	**<0.01**
Symptoms Involving Respiratory System and Other Chest Symptoms	3.97 (3.65-4.30)	3.95 (3.64-4.29)	5.00 (3.02-8.17)	0.23
Symptoms Involving Digestive System	0.18 (0.13-0.25)	**0.16 (0.12-0.22)**	**2.08 (0.66-6.37)**	**<0.01**
Injury and Poisoning	46.00 (45.13-46.88)	**45.85 (44.97-46.72)**	**58.69 (53.10-64.07)**	**<0.01**
Injury and Poisoning: Internal Injuries	4.53 (4.22-4.88)	4.53 (4.21-4.87)	4.78 (2.87-7.86)	0.79
Injury and Poisoning: External Injuries	43.26 (42.41-44.11)	**43.11 (42.26-43.96)**	**55.69 (49.98-61.25)**	**<0.01**
Imaging Codes (ICD, CPT)	21.77 (20.46-23.14)	**21.60 (20.29-22.96)**	**35.96 (29.42-43.08)**	**<0.01**
Mental Health	5.01 (4.63-5.41)	5.02 (4.64-5.43)	4.04 (2.37-6.79)	0.28

Bold denotes statistical significance, $p < 0.01$; individual diagnostic codes included for each category can be found in Appendix D

[Although examined, codes included in the following groups had < 10 in certain cells, precluding reporting per HCUP Data Use Agreement: Circulatory (390-459), Symptoms Involving Nervous and Musculoskeletal Systems (781), Symptoms Involving Skin and Other Integumentary Tissue (782), Symptoms Involving Urinary System (788), Other Ill-Defined and Unknown Causes of Morbidity and Mortality (797-799), Supplementary Classification of Factors Influencing Health Status and Contact with Health Services (V-codes), and codes for thyroid injuries]

Table 4.3. Symptoms and Injuries Identified in Qualitative Sample Interviews and Medical Record Data

	Carole	Sophie	Feleysa	Mae	Amberle *	Jolena	Olivia	Ishawna	Participant Experiences: Examples
Head and Neck									
Hemorrhages: sclerae, conjunctivae petechiae									"I think one of the doctors here, she diagnosed me with the hemorrhage in my eye…" ("Carole")
Head trauma									(punches to head, hitting head on object; orbital/nasal fractures, periorbital ecchymoses, concussion)
Headache									"…because I knew my head kind of hurt. I had a spot where I hit my head, and that was really sore, and I was like, 'I think I hit my head really, really hard, so let me go make sure I don't have a concussion.'" ("Ishawna")
Neck bruising (unaided and/or ALS)			(ALS -)	(ALS -)		(ALS -)			"So it's like I didn't expect anything but when she said she seen bruises under the light on my neck I just was like 'Oh my God. I really put myself through this again,' but I didn't really expect nothing." ("Amberle")
Neck pain									"My neck and my—I guess in between my shoulder and my neck area was sore." ("Mae")
Neck swelling									"…I forgot that he even strangled me until they started feeling my neck and then that's when the flashbacks started coming back, and I told them. I was like 'My neck's sore and it's swollen.' That's when they just

	Carole	Sophie	Feleysa	Mae	Amberle *	Jolena	Olivia	Ishawna	Participant Experiences: Examples
									started examining my neck…" ("Amberle")
Sore throat									"My throat was very sore." ("Carole")
Voice changes and/or pain when speaking									"It was a little bit more raspy, but I more so wasn't projecting as much because it was very—it hurt a lot." ("Ishawna")
Difficulty and/or pain on swallowing									"I just know it hurt really badly to swallow, and that was the biggest thing where I was like, 'Something's wrong,' because it was excruciating where I didn't even want to swallow my own saliva." ("Ishawna")
Neurological/Neurovascular									
Lightheadedness									"Light-headed, and it shot my blood-pressure up to 218 over 118." ("Olivia")
Loss of consciousness									"And I just remember thinking, 'Oh, my God. I am about to die,' and I don't really remember anything else after that." (Ishawna)
Memory loss									
Vision changes					?? (attribut		??eyes bulging		"…Everything got really, really warm, and the only way I can explain it is where it got dark from the outside

	Carole	Sophie	Feleysa	Mae	Amberle *	Jolena	Olivia	Ishawna	Participant Experiences: Examples
					ed to crying)		from pressure		and then started to close in. And I don't know if that's blacking out. All I know is that things closed in…it was from the outside of my eyes and closing in…" ("Sophie")
Other Injuries/symptoms attributed to strangulation event									
Breathing changes									"It was just like I'm just gasping for air and it's like is this how it feels to die? Is this going to be what it's like? The longer he hold me, the less breath I'm going to be able to take." ("Feleysa")
Coughing									"I'm in the (ED). Didn't cough not one time. Come home, go to bed, right, cough all night." (Jolena)
Nightmares									"It took me awhile to sleep but I'm just getting my sleep back actually. That whole week I didn't really sleep. I was having nightmares." ("Amberle")
Sleep disturbance									
Increased anxiety									"I'm just more anxious. I'm very anxious." ("Sophie")
PTSD									"…I see everything from the butcher knife to the choking to the fire to the police being called, the police being there with their guns out at him, pushing me away—I see it all every day, like 10, 15, 20 times a day." ("Olivia", reports diagnosed with PTSD by psychiatrist after event)

	Carole	Sophie	Feleysa	Mae	Amberle *	Jolena	Olivia	Ishawna	Participant Experiences: Examples
Other emotional pain									"I haven't addressed, like, internal pain for me, or emotional pain." ("Feleysa")
Imaging									
Head/neck									CT head (x2), CT maxillofacial (x2), CT soft tissue neck with contrast (x1)
Other									X-rays of foot, hand (x2), chest

Yellow: present at time of assault; Orange: present at time of exam; Red: present at both time of assault and time of exam; Purple: developed after ED visit
**only able to report from interview; med record review not consented*

CHAPTER 5: SYNTHESIS/DISCUSSION

Introduction

This study considered NF-IPS within the National Academies of Sciences, Engineering and Medicine's conceptualization of the diagnostic process.[1] Communication of diagnoses through electronic health records and coding mechanisms like the International Classification of Diseases (ICD) can support continuity of an individual's care as well as broader epidemiologic studies of a health concern. However, diagnostic and treatment processes rely on many factors, such as the development of patient and family partnerships, systems designed to support workflows, and effective collaboration and communication of all members of the health care team.[1,2] These factors are especially critical in identifying cases of NF-IPS, after which survivors may not clearly recall details of their trauma or may be fearful of sharing information with the care team due to stigma or safety concerns.[3]

The purpose of this study was to lay the foundation for a program of research to enhance accurate, timely diagnosis for, and effective communication of risk to, women who survive strangulation by an abusive partner. Triangulation and integration of quantitative results with qualitative findings in a convergent design[4] serve to inform our emergency care approaches, supporting both safety and health outcomes for this vulnerable population.

Specific Aims

This mixed methods study included three specific aims:

- Aim 1 (Quantitative): Estimate prevalence and associated characteristics of visits with an ICD-9-CM code for non-fatal, non-self-inflicted strangulation among

women ages 18 and older who presented to a U.S. emergency department from 2006-2014 and whose visit included an ICD-9-CM code for spousal or partner abuse.

- Aim 2 (Qualitative): Explore care-seeking behaviors, the context of the care seeking, treatment expectations, and understanding of strangulation-related diagnosis and health risks in a sample of women ages 18 and older who present to a U.S. emergency department after NF-IPS.
- Aim 3 (Mixed-Methods): Triangulate and integrate the quantitative and qualitative data analyses from Aims 1 and 2 to provide a more comprehensive understanding of the diagnostic process for post-strangulation emergency care of women.

This chapter provides a summary of results/findings, discussion of study strengths and weaknesses, implications for nursing and recommendations for future research.

Summary of Results/Findings

Aim 1

Weighted prevalence of visits with co-occurring strangulation codes among those with IPV codes was estimated at 1.2% (99% CI: 1.00-1.47), or 121 strangulation visits per 10,000 IPV visits. Examining diagnoses collapsed into HCUP Clinical Classification Software categories, we found the top five principal categories to be similar comparing those IPV visits with and without strangulation codes. In the fully adjusted multivariable logistic regression model, we found significantly higher odds of IPV-coded visits having a concurrent strangulation code from the third (OR 1.51, 99% CI: 1.04-2.20) and fourth (OR 1.55, 99% CI: 1.01-2.39) quartiles of patient ZIP-code income level, Level

I/II/collapsed trauma centers (OR = 1.64, 99% CI: 1.10-2.46), hospitals from non-Northeast regions (Midwest: OR = 3.01, 99% CI: 1.67-5.43; South: OR = 1.92, 99% CI: 1.11-3.32; and West: OR = 2.42, 99% CI: 1.47-4.01), and visits from years 2012 (OR = 2.29, 99% CI: 1.17-4.48), and 2014 (OR = 3.21, 99% CI: 1.68-6.13). Year 2013 also demonstrated a significant increase from 2006, though not reaching the *a priori* threshold of $p < 0.01$ (1.97, 99% CI: 1.00-3.88, $p = 0.10$).

Aims 2 and 3

All the women interviewed recognized and reported their strangulation, but what that meant for their health, both acutely and long-term, was not clear to them. Three women did not recall any specific discussions with the healthcare staff about strangulation and health risks. Though many of the women expressed a fear of dying during the strangulation, seeking health care was not their first thought or priority once the event was over. Engaging with health care was suggested by others, such as police, family, friends or other trusted individuals. Once in the ED, most women felt safe and reported that staff exhibited several trust-building behaviors that supported them feeling cared about and included in the process. None of the women expressed reluctance or fear either in seeking care or sharing with staff that they had been strangled, some even before being asked by staff.

The most common co-occurring NEDS ICD-9-CM code groups among all IPV-related ED visits were injury and poisoning [46.00% (99% CI: 45.13-46.88)] and symptoms involving the head and neck [8.25% (99% CI: 7.57-8.99)]. Strangulation-coded visits were significantly more likely than IPV visits without strangulation coding to have concurrent code categories (please see Ch. 4 Appendix D for codes included in each

category) for musculoskeletal/connective tissue symptoms (15.65% vs 4.37%, $p < 0.01$), general symptoms such as altered consciousness (5.42% vs 2.41%, $p < 0.01$), head and neck symptoms (13.60% vs 8.18%, $p < 0.01$), digestive system symptoms such as dysphagia (2.08% vs 0.16%, $p < 0.01$), and injury/poisoning (58.69% vs 45.85%, $p < 0.01$). No significant difference was found between those with and without strangulation codes for neurologic/sense organs (3.11% vs 2.07%, $p = 0.12$), respiratory or chest symptoms (5.00% vs 3.95%, $p = 0.23$), or acute mental health conditions (4.04% vs 5.02%, $p = 0.28$).

A significantly higher percentage of NEDS visits with both IPV and strangulation codes had a co-occurring external (head/neck-related) injury code versus IPV visits lacking a strangulation code (55.69% with strangulation versus 43.11%, without $p < 0.01$). Internal head/neck-related injury codes were not significantly different between those IPV visits with strangulation coding compared to those without (4.78% versus 4.53% respectively, $p = 0.79$), though both groups did have codes reflecting neurological injuries. The NEDS data revealed greater odds of co-occurring head and neck imaging for those with strangulation-coded visits compared to those without these codes (35.96% versus 21.60%, $p < 0.01$).

Similar symptoms were endorsed by women in the study interviews and their associated medical records. Women frequently reported breathing changes at the time of the assault and neck pain at either the time of the assault, time of ED visit, or both. Half of the participants reported lightheadedness or near-loss of consciousness during the strangulation, while one experienced both loss of consciousness and limited memory of the event. Over half also had external neck injuries, visible unaided and/or via alternate

light source (ALS). Other symptoms and injuries varied among the participants, both by type and time frame. However, one participant noted neck pain after her ED visit, and others recounted post-visit mental health concerns they attributed to the event, emphasizing injury and symptom development may continue even after seeking care.

Among visits coded for IPV in the NEDS analytic dataset, strangulation coding was present in 1.2%. Of the seven medical records reviewed, strangulation as a specific injury mechanism was not included in documentation of clinical impressions (domestic violence, old facial fractures, conjunctival hemorrhage, ecchymosis, facial contusion, head trauma, non-displaced tracheal cartilage fracture, alleged assault, alleged sexual assault, physical assault, concerns for domestic violence, toe sprain, and sexual assault with hand, neck and back pain) or final diagnoses (two as "domestic abuse," three as "domestic violence" (one of which included a co-occurring diagnosis of "alleged sexual assault") and one as "sexual assault"), though it was included in physician and nursing encounter notes.

Discussion

Strengths and Limitations

This study adds to the limited literature on this unique violence mechanism by describing nine years of U.S. emergency department NF-IPS coding trends among visits by women 18 years and older coded for IPV. The mixed-methods study design also allowed triangulation of this quantitative analysis with patient-level information and women's narratives, resulting in subjective and objective exemplars of the diagnostic process and rich descriptions of NF-IPS survivors' emergency care-seeking experiences.

This study has several limitations. Regarding the quantitative data, the NEDS dataset defines an observation/unit as individual ED discharge records of visits, not unique patients. Due to the de-identification of the dataset, we were unable to determine if multiple visits were from certain individual patients, which could overestimate the actual number of women seeking care. Because data in NEDS were not originally designed for the purpose of this study, we were unable to examine the impact of potential residual confounding from socioeconomic risk factors that were not collected, such as individual patient income level, education, employment, race/ethnicity, or gender of abuser on the likelihood of reporting strangulation codes.

Medical coding itself is a complex task. Coders with specialized training review and abstract information from visit documents. From this data, they identify diagnoses, procedures, and services and assign applicable ICD, CPT and other codes, striving for the highest level of specificity and accuracy. Their efforts support subsequent billing claims as well as create uniform data between health facilities for efficient local, regional and national research and analysis. However, the opportunity to apply strangulation coding may inadvertently be missed by coders if provider documentation does not clearly link strangulation as a contributor to injury diagnoses. Owing to the high-paced ED environment, providers may not always be readily accessible for record clarification requests, leaving coders to make the best decisions possible given available information. This could have resulted in an underestimation of visit prevalence.

Women experiencing multiple strangulations have been reported to seek care at greater frequencies than those with fewer strangulations[5] so those coded as such in this sample may indicate increasing abuse severity, possibly overestimating co-occurring

symptoms. Studies of ICD-9-CM coding use to identify illness/injury have reported variable accuracy and miscoding of visits could exist.[6-9] In addition, if identification and subsequent documentation and coding of strangulation is reliant on clinicians' ability to visualize injuries, these findings may be woefully underestimating the prevalence of strangulation in IPV-related ED visits. Women may experience memory loss related to hypoxia or other injury related to the physical assault as well as from the psychological trauma of the event, limiting their ability to recall and share this important mechanism with the care team. The current study was not designed to evaluate data on women who declined to seek ED care or who died before being able to seek care, which could contribute to underestimates of injuries.

The qualitative sample may have been subject to recall and information biases. Medical record documentation could have had omissions or errors. We were limited to record reviews for the study recruitment ED and FNE program, so may have missed pertinent information for those who sought care at another ED first (n=4). One participant declined to provide consent for medical record review, precluding the ability for comparison with interview data. Those agreeing to be contacted may have done so because of a positive FNE experience, as we relied on the FNE team to obtain this permission. The FNEs may also have used professional discretion in foregoing mention of the study, respecting the patient's clinical and emotional care needs, including those requiring hospital admission, possibly introducing selection bias. Though qualitative data is not designed for generalizability, the study sample was recruited from an ED with an embedded FNE program, and findings may be dissimilar for EDs without this specialized resource. Findings may also not reflect the experiences of women whose injuries require

hospital admission. Although previous literature suggests basic meta-themes may be present in as early as six interviews, [10] additional data may be needed to achieve full thematic saturation. Additionally, the interviewer (MP) was the primary analyst and, as a nurse with previous professional experience in an ED, this may have unconsciously biased or influenced data interpretation.

Practice, Theory and Policy Implications for Nursing

Patient Experiences a Health Problem and Engages with the Health Care System

Women agreeing to participate in study interviews all acknowledged they sought ED care at the encouragement of others including, in many cases, police. Nurses can develop ongoing partnerships with law enforcement colleagues, opening dialogues about their knowledge of and experiences with responding to women after NF-IPS, and initiate joint ED staff-police strangulation prevention training opportunities around recognition and response. Nurses should also recognize that women seeking care may minimize or dismiss their symptoms. Moving abused women quickly through the triage process and back into a secure, private area was noted by many interview participants as being extremely important for them to feel safe. Timely sharing of information needed to initiate visitor restriction protocols and heighten situational awareness of ED security personnel is also essential.

Using the NASEM diagnostic process model,[1] we examined post-strangulation emergency care at discrete points in the framework. This was pragmatically helpful, particularly from a translational research perspective. In so doing, a few opportunities for future diagnostic process model iterations were noted. This study operationally defined NF-IPS as an act that leads to significant health problems causing women to engage with

the health care system through the ED. However, similar to other evidence,[5] women who participated in interviews were not necessarily seeking care for a recognized "health problem." Going to the ED was a "means to an end" for them, but not necessarily for diagnosis and treatment. It was a place to have their stories and injuries validated by others and documented to support protection orders and future legal actions. Minimization of injuries was common, and all visits were at the recommendation of police or others the women trusted. This suggests further theory development of this part of the model is warranted.

Information Gathering, Integration, and Interpretation

Recognition of strangulation in women visiting the ED is critical to both their immediate and long-term health. Emergency nurses on the front lines of care are essential to the diagnostic process[11] and well positioned to lead post-strangulation identification and treatment efforts. It is important for nurses to have a high index of suspicion for strangulation in women visiting for IPV and encourage colleagues to also consider this high-risk violence mechanism in their assessments, differential diagnoses, and decision making. Using behavior-specific questions related to strangulation during a regular screening of all patients for intimate partner violence is strongly advised. For example, ED nurses can ask about any pressure applied to the neck, versus "strangled" or "choked," which sometimes more are confusing to patients. Nurses can also familiarize providers and other members of the team, in clinical encounters and operations/practice meetings, with national recommendations for strangulation-specific ED evaluation, co-developed by emergency medicine physicians and forensic nurses,[12,13] and advocate for further study to evaluate their sensitivity and specificity for use in practice.

Even if patients do not disclose strangulation (or may not remember), subtle findings during both clinical history gathering and physical assessment can give clues to recent strangulation. Presentations vary and external injuries may not be readily visible. Significant risk to life can exist with limited to no external injuries. Tools and guidelines are emerging to help front-line teams recognize, evaluate and treat IPS survivors.[12-17] Also not easily visualized, the potential for brain injury in this population must be considered during assessments, care and discharge planning. Strangulation should be included in differential diagnoses for young women presenting with serious neurological concerns like stroke or stroke-like symptoms. Recognize delayed presentations of injury sequelae may occur. For pregnant women, specific guidelines to support medical and radiographic evaluation of NF-IPS have also recently become available for clinical teams.[13] Abused women, including those suffering NF-IPS, often have mental health concerns resulting from individual assaults or long-standing violence, such as increased anxiety, sleep disturbances, or nightmares. Nurses should specifically assess for these symptoms at the time of ED visit and, if present, share these findings with providers and facilitate subsequent consultation with specialists (e.g., social workers, psychiatrists).

From a theory perspective, while the NASEM model describes the process clinicians take to gather, integrate and interpret information leading to a diagnosis,[1] it lacks a parallel process for patients. Many of the women's narratives reflected their assimilation of information they gathered, both verbally and non-verbally, from their ED teams and its impact on their decisions. For instance, Olivia perceived that her team was not fully evaluating her rapid heart rate, resulting in her frustration and anxiety that a serious cardiac concern precipitated by stress was being overlooked. Ishawna, later

learning her injury was "just the thyroid," mentioned that this information partially influenced her decision not to follow up with ENT. Though beyond the scope of this dissertation, future models may wish to more explicitly address this and explore ways of further integrating the patient's experience in the process.

Diagnosis, Treatment, Outcomes

Accurate documentation of strangulation can support individual women's needs for acute and long-term care follow-up as well as communicate diagnoses for larger epidemiologic and population health studies. Objective, detailed documentation of reported mechanism of injury, symptoms and assessment findings can also be critical to women's future legal recourse, should they choose to pursue this intervention.[14,18] Although medical coding must be assigned based on documentation by authorized providers (e.g., physicians, NPs, PAs) and not solely from nursing or technician notes, [19] nurses can help support this process through ongoing dialogue with provider colleagues and, when possible, the coding team, as well as through advocating standardized NF-IPS protocol adoption.

Although the study recruitment site has established strangulation-specific instructions to supplement standard post-assault discharge education, this is not the case in all emergency departments. Electronic patient education materials, used by many healthcare organizations, do not consistently contain language about strangulation and associated health risks. Emergency nurses can drive improvements in this area, developing information sheets for patients presenting to their facilities. Nurses can also support national efforts toward standardized, health literacy-tested strangulation-specific materials, giving women additional information they can review and process post-visit to

inform their health and safety decisions. Education on symptoms for which they should return to the ED (e.g., difficulty swallowing or breathing, worsening pain, symptoms of stroke) should be reviewed with individuals or organizations supporting the patient after discharge. These could include family, friends or shelter staff. Safety planning with the clinical team and advocacy staff prior to discharge is critical, including but not limited to a discussion of the increased risk for homicide.

The importance of a trauma-informed approach to care for women surviving strangulation cannot be overemphasized. Nurses' unique ability to connect with patients was described by the women in this study as a treatment in and of itself. As part of discharge teaching, nurses can further provide anticipatory guidance for additional emotional symptoms they might experience after leaving the ED and share available counseling and advocacy resources. They may ask if she is already established with a therapist or support group and, if so, suggest she schedule a follow-up with them shortly after her ED visit.

An increasing trend of co-occurring IPV/strangulation-coded visits within the study period from 2006-2014 was observed. Given that total IPV-related visit proportions were relatively stable from year-to-year, this increase was not likely due to greater visit volume. Coordinated efforts and leadership via many organizations, such as the national Training Institute on Strangulation Prevention launched in 2011, [20] are driving improvements in strangulation-specific legal penalties[21] and multidisciplinary training for health care, law enforcement, and advocacy staff. These temporal changes may be influencing this increasing trend [20,21] through heightened strangulation recognition by ED clinicians, availability of ED staff trained in forensic assessment including strangulation,

more accurate ICD code assignment due to improved documentation, and increasing public awareness of strangulation as a high-risk form of violence. It is also possible the findings reflect increasing violence by strangulation or, with the increased adoption of electronically accessible records, that coders are more readily able to access information to support this as a diagnosis or E-code. However, with limited information, the exact role played by the above factors cannot be further assessed. Nurses and other clinicians can continue to advocate for strong strangulation-specific legislation, as it is currently present in some form in 47 of the 50 U.S. states. [20]

Certain subpopulations also warrant particular attention. Although not statistically significantly different from IPV-only coded visits, those with strangulation codes had "Other Complications of Pregnancy" as the fourth most commonly assigned principal CCS category. Existing evidence suggests multiple strangulations are associated with a higher risk of miscarriage (ARR 5.08, $p < 0.05$)[22] compared to no strangulation among female survivors of IPV. Policies addressing strangulation assaults should consider and include specific language about maternal risk based on existing protocols.[13] Of note, two women interviewed mentioned that their abuser had a martial arts or military background, and future research and policy efforts should spotlight those with specialized training in physical neck holds.[23]

Our collective ability to better understand strangulation-specific visit prevalence and women's subsequent care needs is, to a large extent, reliant on data. The proliferation of electronically available data can support patient safety through easier continuity of care, rapid information exchange, and research. However, it can also make data more easily accessible to abusers. Other individuals or entities may disregard the critical

sensitivities of sharing abuse information or, worse, use it to deny women insurance coverage or other protections.[24] These risks may give clinicians pause in documenting abuse including strangulation out of protection for their patients. Continued strengthening of legislation to address these concerns and ensure the safety of women's health information is also needed.

Recommendations for Future Research to Support Practice and Policy

Nursing research can vitally contribute to the growing NF-IPS science. Further population-based studies using both state and national patient-level (versus visit-level) data would provide additional valuable information about strangulation-related care-seeking by women over time, such as visit patterns, complications from index injuries and new injuries from repeated strangulations. Comparative studies examining the anticipated improved specificity of ICD-10-CM coding and its ability to better capture NF-IPS data is needed. Development of a national data repository for post-strangulation clinical data is underway, led by a nurse researcher, [25] and is eagerly anticipated as a source for further descriptive and inferential analyses.

Using ALS, FNEs were able to visualize subdermal findings in five of the eight cases, and these were consistent with women's recollections of their strangulation. Many of the women indicated it was important for others to see their injuries and positive ALS findings validated their assault experiences. Literature is emerging to highlight both the potential uses[26,27] and current limitations[28,29] of ALS use in clinical practice. Existing evidence also suggests that identifying external injuries may be even more difficult in women of color.[30] Though further investigation by nursing researchers and others is warranted, use of ALS[27] and other technologies[31] show promise and may provide

additional support to guide subsequent diagnostic imaging and differentiation of higher-risk patients. This may be particularly helpful as clinicians consider emerging national post-strangulation medical and radiological evaluation recommendations[12] along with each patient's unique clinical picture, radiation exposure risks[1,32] and ED operational realities like cost containment and overcrowding.[33,34]

Provider-documented clinical impressions and final diagnoses in the qualitative arm reflected domestic violence, domestic abuse or sexual assault, but none specifically included strangulation, heightening the suspicion that the national prevalence estimate of coded NF-IPS visits may be severely underestimating this potentially deadly form of violence. Women interviewed did not have a sense of long-term risk from their injuries beyond addressing their emotional trauma. This reflects the larger issue that NF-IPS research is nascent and needs continued focus. Questions about long-term risks associated with topics such as earlier age stroke development, disability from traumatic brain injury, or future morbidity from undetected or multiple strangulation-related carotid dissections remain outstanding. Longitudinal studies of abused women who have survived strangulation, particularly regarding neurological and vascular condition development, would add considerable insights to the existing knowledge base and support refinements to emerging protocols. The association between strangulation and other negative maternal-fetal outcomes such as miscarriage should be further examined to determine unique risks for this subpopulation.

It will be important to test emerging technology's ability to support both women and clinicians at various points in the diagnostic process for NF-IPS. For example, expanding on work by nurse-researcher colleagues[35,36] a multi-site experimental study

comparing an existing electronic tailored safety decision aid, with additional strangulation-specific content, to regular care in ED settings could examine feasibility and effectiveness of this tool in supporting NF-IPS safety planning. Community-based deployment and testing of a similar tool would provide an important understanding of its potential to help women make informed choices for their health and safety and, if they choose, access resources such as ED care. Electronic ED clinical decision support systems providing just-in-time NF-IPS evidence-based guidelines for clinicians based on patients' presenting details (e.g., female with head or neck injury) could also be tested via a pre-post quasi-experimental design to determine rates of strangulation-specific screening, recognition, evaluation and documentation.

Replication of the qualitative arm of this study, both with larger sample sizes and in EDs without embedded forensic programs, would allow further comparison of women's post-strangulation care-seeking experiences. Other subpopulation explorations are also warranted. Messing and colleagues[37] examined 19,429 police reports for domestic violence, finding NF-IPS also occurring in both male and female same-sex partners, with a call for additional study in sexual and gender minorities. Campbell, Thompson and team[38] conducted a retrospective analysis of law enforcement DV incident information sheets, finding IPV victims whose partner had a history of pet abuse were significantly more likely to have been strangled by the suspect compared to those without a history of pet abuse (76% versus 47%, $p < 0.05$). Strangulation occurring during the incident involving law enforcement response was also statistically higher for suspects with versus without pet abuse histories (44% versus 27%, $p < 0.05$). Two of the women in this dissertation study mentioned fearing for their pets, either in their interview or in

medical record documentation, indicating the need for further research by nurses and others into the role of pets in strangulation prevention efforts. Additionally, although NF-IPS appears to occur more frequently in younger age groups, qualitatively examining women's strangulation experiences and subsequent ED care seeking as they age would provide rich detail about their unique perspectives and needs. For instance, one woman in this study was over age 60 and mentioned how being assaulted and strangled at her age, and needing shelter, was incongruent with her expectation of being a role model for younger women.

In closing, it is imperative to acknowledge that ED crowding and incremental practice stresses have skyrocketed over the past several decades, presenting a very real challenge to patient safety.[33] Therefore, urgency exists to ensure practice recommendations are based on strong evidence. Further research to improve precision of prevalence and morbidity estimates, diagnostic decision-aids, and the evidence base for acute evaluation and treatment needs in ED settings would strengthen recommendations at both the individual health system and national levels. Approaching this science with thoughtful consideration to both up- and down-stream effects to patient and practice safety, nurse-researchers can lead efforts to further reveal the public health impact and emergent care needs of women surviving intimate partner strangulation.

Summary

Intimate partner strangulation is an understudied and unique mechanism of violence against women. With cumulative and more recent data, this study contributes to the growing NF-IPS science by providing strangulation-coded visit prevalence and characteristics among abused women seeking ED care. In closing, the critical importance

of nursing's role in the ED diagnostic process and, therefore, the value of ongoing research to build the evidence base for nursing and ED best practices is eloquently expressed in direct quotes from study participants:

> "They were very informative…(the forensic nurse) came in and she talked to me and then a doctor came in behind her. He kind of explained the same thing. Then, she came back again and she talked to me. She gave me time. She went through everything, what she was going to do. So even (though) I didn't know what was going on. She still took it step by step."

> "So I was clueless as to what I was going to have to go through, but the nurse…she was very compassionate. She just kept hugging and was, like, 'Everything's going to be okay.' And it's just what I needed at that moment in time, just to feel like I'm not wrong."

> "I asked her questions about what she was doing. She explained stuff to me, like, as I was going along…she explained stuff to me that I understood it, and that felt comfortable…"

> "To go through what I went through, you don't—I haven't experienced a lot of kindness…and the type of kindness that she offered, you don't get to see every day, and I needed that. I needed it exactly then. She gave me exactly what I needed at the end of a really long day and especially when it was going to be really invasive. And it was just exactly what I needed right then and there."

> "Just tell (the nurse) I loved her, and she made me feel very comforted…(a)nd she was the only one, other than the (advocate) team, that day that did."

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SCHOLARSHIP

Investigations Funded

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1. **Patch, M.** Intimate partner violence: How to start a conversation with your patients and staff. September 2018. http://closler.org/lifelong-learning-in-clinical-excellence/intimate-partner-violence-how-to-start-a-conversation-with-your-patients-and-staff
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3. "Partners in Patient Safety: MCIC Emergency Department Patient Safety Collaborative," Patient Safety and Quality Healthcare publication, September/October 2012. http://www.psqh.com/september-october-2012/1412-empsf-2nd-annual-patient-safety-summit.html
4. "The American Nurse: 17 Hopkins Nurses Share Their Wisdom," Johns Hopkins Nursing magazine, Summer 2012. http://magazine.nursing.jhu.edu/2012/08/the-american-nurse/
5. The American Nurse Project, 2012, interviews entitled: "Healthcare Workers as Second Victims," "Maintaining Professionalism When a Friend is Admitted," "Patients with a History of Violence." http://americannurseproject.com/
6. "Preventing Disruptive Behaviors in Patients: Nurses Collaborate and Champion Programs," Johns Hopkins Nursing magazine, Spring 2012. http://magazine.nursing.jhu.edu/2012/04/preventing-disruptive-behavior-in-patients/

Conference Meetings / Presentations

International

2018 Wright, R., Baptiste, D., **Patch, M.**, Myers, V., & Bright, L. "Establishing a patient-centered emergency department palliative care program: a transdisciplinary approach." Sigma Theta Tau International's 4th Biannual European Conference, Cambridge, England. [podium presentation]

2017 **Patch, M**., & Saheed, M. "TeamSTEPPS: A Primer." Fundacion Santa Fe de Bogota, Polytrauma Management: A Team Approach Conference, Bogota, Colombia. [podium presentation]

2017 **Patch, M.** "Role of the Trauma Nurse in Trauma Patient Care" and "Trauma Nurse Coordinator Professional Development: How to Build a Career," Fundacion Santa Fe de

Bogota, Polytrauma Management: A Team Approach Conference, Bogota, Colombia. [podium presentations]

2017 Campbell, J. C, Reed, D., & **Patch, M.** "Opportunities for International Interdisciplinary Research Collaborations to Improve Health Outcomes for Intimate Partner Strangulation Survivors," Sigma Theta Tau International's 28th International Nursing Research Congress, Dublin, Ireland. [podium presentation]

2016 **Patch, M.** "Innovative Approaches to Promote Nursing Hand Hygiene Success in an Emergency Department," Sigma Theta Tau International's 27th International Nursing Research Congress, Cape Town, South Africa. [podium presentation]

2016 **Patch, M.**, Regan, L., Neira, P., & Peterson, S. "Partners in Care: Nursing's Influence in an Emergency Medicine Residency Program," Sigma Theta Tau International's 27th International Nursing Research Congress, Cape Town, South Africa. [poster presentation]

2013 **Patch, M.** "Striving for Synergy: Combining External and Internal Wisdom to Achieve Best Safety Practices in Health Care" and "Our Patient Safety Journey: The Johns Hopkins Hospital," IX International Nursing Seminar Universidad de los Andes School of Nursing, Santiago, Chile. [invited speaker]

National

2019 Petri, L., Golway, M., Cook, L., **Patch, M**., Franquiz, R., & Dickson, M. "Nursing Specialty Certification in Maryland." American Nurses Association's Pathway to Excellence Conference, Orlando, FL [poster presentation].

2018 Whalen, M., Maliszewski, B., **Patch, M.**, Lindauer, C., & Baptiste, D. "Increasing Nursing Scholarship Through Dedicated Human Resources." Emergency Nurses Association's Emergency Nursing 2018 Conference, Pittsburgh, PA. [poster presentation]

2017 Campbell, J. C., Bergin, A., & **Patch, M.** "Synergizing the Response to Domestic Violence Strangulation: Building Collaborative, Cross-setting Protocols for Safety and Health." National Conference on Health and Domestic Violence, San Francisco, CA. [podium presentation]

2017 **Patch, M.**, & Campbell, J. C. "Prevalence and Associated Characteristics of Emergency Department Visits by Women After Non-Fatal Intimate Partner Strangulation and Subsequent Diagnostic and Treatment Experiences: A Mixed Methods Study," Association for Clinical and Translational Science's Translational Science 2017, Washington, DC. [podium and poster presentations]

2016 **Patch, M.**, & Campbell, J. C. "Violence as a Structural Determinant of Health." Council for the Advancement of Nursing Science, State of the Science Congress on Nursing Research, Washington D.C. [podium presentation]

2016 **Patch, M.**, Neira, P. M., Maliszewski, B., Hamer, C., & DeRuggiero, K. "The Evolution of Hand Hygiene Success in an Emergency Department," National Patient Safety Foundation's Annual Patient Safety Congress, Scottsdale, AZ. [poster presentation]

2016 Regan, L., Peterson, S., Omron, R., Neira, P., Bright, L., & **Patch, M.** "Partners in Training, Partners in Care: Integrating Nurses in EM Residency Training," Council of Emergency Medicine Residency Directors Academic Assembly, Nashville, TN. [e-poster presentation]

2015 **Patch, M.** "The Health Care Professional: Screening for Interpersonal Violence," Research Summit on Domestic Violence, Saving Promise and Janssen Pharmaceuticals Inc., Titusville, NJ. [invited speaker]

2013 Procopio, G., Murtaza, U., Ortmann, M., **Patch, M.**, & Saheed, M. "Evaluation of a Diabetic Management Protocol for Diabetic Patients Presenting to the Emergency

Department with Hyperglycemia," American Society of Health-System Pharmacists Midyear Clinical Meeting, Orlando, FL. [poster presentation]

2012 Goldfarb, M., Scheulen, J., & **Patch, M.** "Partners in Patient Safety: MCIC Emergency Department Patient Safety Collaborative," Emergency Medicine Patient Safety Foundation 2nd Patient Safety Summit, San Antonio, TX. [podium presentation]

Regional

2019 **Patch, M.** The Academy of Forensic Nursing's Regional Conference: "Beyond the Bedside: Increasing the Footprint of Forensic Nursing," Indianapolis, IN [invited speaker]

2018 Petri, L., Golway, M., Cook, L., **Patch, M.**, Franquiz, R., & Dickson, M. "Nursing Specialty Certification in Maryland." Maryland Nurses Association's 115th Annual Convention, Woodlawn, MD. [poster presentation]

2018 **Patch, M.** "Intimate Partner Strangulation: A Primer for ED Nurses." Maryland Emergency Nurses Association Annual Conference, ENA By the Bay, Linthicum, MD. [invited speaker]

2017 Petri, L., Golway, M., Cook, L., **Patch, M.**, Franquiz, R., & Dickson, M. "Nursing Specialty Certification in Maryland," Maryland Action Coalition Summit 2017, Baltimore, MD. [poster presentation]

2016 **Patch, M.**, Neira, P. M., Maliszewski, B., Hamer, C., & DeRuggiero, K. "The Evolution of Hand Hygiene Success in an Emergency Department," 7th Johns Hopkins Medicine Annual Patient Safety Summit, Baltimore, MD. [poster presentation]

2016 **Patch, M.**, Regan, L., Neira, P., & Peterson, S. "Partners in Care: Nursing's Influence in an Emergency Medicine Residency Program," 7th Johns Hopkins Medicine Annual Patient Safety Summit, Baltimore, MD. [poster presentation]

2016 **Patch, M.** "Intimate Partner Violence," The Black Nurses Association of Greater Washington D.C. Area's Annual Salute to the Black Nurse of the Year and Scholarship Awards Luncheon. [invited panelist]

2015 Tolson, T., Dutton, M., Justice, P., Cvach, M., Peterson, S., Saheed, M., & **Patch, M.** "A Multi-Phase Approach to Reducing Unnecessary Alarms in the Adult Emergency Department," 6th Johns Hopkins Medicine Annual Patient Safety Summit, Baltimore, MD. [poster presentation]

2015 Procopio, G., Murtaza, U., Ortmann, M., **Patch, M.**, & Saheed, M. "Evaluation of a Diabetic Management Protocol for Diabetic Patients Presenting to the Emergency Department with Hyperglycemia," 19th Annual Society for Academic Emergency Medicine (SAEM) Mid-Atlantic Regional Meeting, Washington, DC. [poster presentation]

2013 Broache, M., **Patch, M.**, & Lynch, C. S. "Improving Hand Hygiene in The Johns Hopkins Hospital Adult Emergency Department," Johns Hopkins Medicine Patient Safety Summit, Baltimore, MD. [poster presentation]

2013 **Patch, M.**, & Sawyer, M. "Ask a CNS: Q & A on the Clinical Nurse Specialist Role," Maryland Association of Nursing Students, 33rd Annual Convention, Baltimore, MD. [invited panelists]

2012 Goldfarb, M., Scheulen, J., **Patch, M.**, DeRuggiero, K., & Hill, P. "Partners in Patient Safety: MCIC ED Collaborative," Johns Hopkins Medicine Patient Safety Summit, Baltimore, MD. [poster presentation]

2010 **Patch, M.**, DeRuggiero, K., Goldfarb, M., Scheulen, J., & Hill, P. "Partnering for Safety: The ED and MCIC," Johns Hopkins Medicine Patient Safety Summit, Baltimore, MD. [poster presentation]

2010 Fang, E., Ortmann, M., Murtaza, U., Feroli, B., **Patch, M.**, Gill, C., & Hurowitz, L. "Reducing Medications in Wrong Pocket of Automated Dispensing Cabinets," Johns Hopkins Medicine Patient Safety Summit, Baltimore, MD. [poster presentation]

2010 Fang, E., Ortmann, M., Murtaza, U., Feroli, B., **Patch, M.**, Gill, C., & Hurowitz, L. "Reducing Medications in Wrong Pocket of Automated Dispensing Cabinets," Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, PA. [poster presentation]

Local

2017 Brewer, V., **Patch, M.**, Dutton, M., & Arciaga, Z. "Implementation of a Multi-Disciplinary Debriefing Pilot in an Adult Emergency Department," Fuld Fellows Leadership Program and Research Scholars Poster Presentation Conference, The Johns Hopkins University School of Nursing, Baltimore, MD. [poster presentation]

2016 **Patch, M.** "Innovative Approaches to Promote Nursing Hand Hygiene Success in an Emergency Department," Johns Hopkins Nursing Scholars Day 2016, Baltimore, MD. [poster presentation]

2016 **Patch, M.**, Regan, L., Neira, P., & Peterson, S. "Partners in Care: Nursing's Influence in an Emergency Medicine Residency Program," Johns Hopkins Nursing Scholars Day 2016, Baltimore, MD. [poster presentation]

2015 Peterson, S., **Patch, M.**, Saheed, M. & Regan, L. "Patient Safety and Quality Improvement: A New, Interdisciplinary Approach to a Resident Physician Curriculum in The Johns Hopkins Hospital Emergency Department," Maryland Patient Safety Center Annual Conference, Baltimore, MD. [poster presentation]

2014 Cover, A., **Patch, M.**, & Pontone, K. "Boarding Time in the Psychiatric Emergency Department," Fuld Fellows Leadership Program and Research Scholars Poster Presentation Conference, The Johns Hopkins University School of Nursing, Baltimore, MD. [poster presentation]

2014 MacDonald, K., & **Patch, M.** "A Review of the Value of a Personal Staff Panic Button in the Emergency Department at The Johns Hopkins Hospital," Fuld Fellows Leadership Program and Research Scholars Poster Presentation Conference, The Johns Hopkins University School of Nursing, Baltimore, MD. [poster presentation]

2013 Heuklom, S., & **Patch, M.** "Development of a Case Study Based De-escalation Training in The Johns Hopkins Emergency Department," Fuld Fellows Leadership Program and Research Scholars Poster Presentation Conference, The Johns Hopkins University School of Nursing, Baltimore, MD. [poster presentation]

PROFESSIONAL ACTIVITIES

Positions Held in Professional Associations:

2018-present Member, Academy of Forensic Nursing

2018-present Member, National Neurotrauma Society

2016-present Member, Emergency Nurses Association

2015-2018 Vice President, Nu Beta Chapter, Sigma Theta Tau International Nursing Honor Society

2015-2016 Member, Council for the Advancement of Nursing Science

2014-present	Member, Graduate Nursing Student Academy, American Association of Colleges of Nursing
2000-present	Member, Sigma Theta Tau International Nursing Honor Society
2007-2015	Member, National Association of Clinical Nurse Specialists
2007-2009	Member, American Nurses Association/Maryland Nurses Association (District 2)
2005-2009	Member, International Association of Forensic Nurses

Memberships/Office Held in Public or Private Agencies:

2017-present	Member, Baltimore City Domestic Violence Fatality Review Team, Baltimore MD
2016-present	Member, Maryland Action Coalition, Education Subcommittee and Certification Subgroup
2014-2016	Member, Maryland Action Coalition, Metrics Subgroup, MD
2008-2011	Member, Baltimore City Domestic Violence Fatality Review Team, Baltimore MD

Other Professional Activities

2018	Governing Board Member, Healthcare Innovation Forum, Baltimore MD
2018	Boardroom Session Facilitator, Healthcare Innovation Forum, Philadelphia PA

Curriculum Vitae **Michelle A. Patch**
Part II

EDUCATIONAL ACTIVITIES

Teaching Assistantship

2015 Application of Research to Practice (NR110.503), online course for 38 nursing graduate students, The Johns Hopkins University School of Nursing, Baltimore, MD.

Clinical Preceptor/Mentorship

2018-2019 Nursing Graduate Fellow, The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety (The Fuld Fellows Leadership Program), The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Supporting the Proactive Risk Assessment Group (PRAG): Care of Behavioral Health Patients in Non-Behavioral Inpatient Care Settings."

2017-2018 Fellow, Armstrong Institute Patient Safety Leadership Academy, Baltimore, MD. Project: Palliative Care in the Emergency Department.

2017 MSN Nursing Administration student, University of South Carolina, Columbia, SC. Project: "Engagement of Clinical Technicians to Lead Sepsis Success."

2016-2017 Nursing Graduate Fellow, The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety (The Fuld Fellows Leadership Program), The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Critical Event Debriefing in an Emergency Department."

2015 MSN program, Clinical Nurse Specialist student, Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Emergency Department Sepsis Attack Team Program Evaluation."

2014 Nursing Undergraduate Fellow, The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety (The Fuld Fellows Leadership Program), The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Boarding Time in the Psychiatric Emergency Dept."

2014 Nursing Undergraduate Fellow, The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety (The Fuld Fellows Leadership Program), The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "A Review of the Value of a Personal Staff Panic Button in the Emergency Department at The Johns Hopkins Hospital."

2014 Johns Hopkins Medicine Armstrong Institute Patient Safety Fellow, Baltimore, MD. Project: "ECG Labeling Errors."

2013 MSN program, Clinical Nurse Specialist student, Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Analyzing Pre/Post Training Survey Data for a Multidisciplinary De-escalation Curriculum."

2013 MSN program, Clinical Nurse Specialist student, University of Maryland School of Nursing, Baltimore, MD. Project: "Determining Potential Frameworks for Emergency Department Staff Debriefings."

2013 MSN program, Clinical Nurse Specialist student, University of Maryland School of Nursing, Baltimore, MD. Project: "Developing a Proposal for Case Review De-escalation Training for Nursing Staff."

2013 Nursing Undergraduate Fellow, The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety (The Fuld Fellows Leadership Program), The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Developing a Case Review-Based Curriculum for ED Staff De-escalation Training."

2012-2013 Nursing Undergraduate Fellow, The Helene Fuld Leadership Program for the Advancement of Patient Care Quality and Safety (The Fuld Fellows Leadership Program), The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Improving Nursing Staff Hand Hygiene Compliance in the Emergency Department Environment."

2012 MSN program, Clinical Nurse Specialist student, The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Nursing Care Hours and Facility Billing for the Intoxicated Patient."

2011 MSN program, Clinical Nurse Specialist student, The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Isolation Status Communication Challenges in the Emergency Department."

2010 MSN program, Clinical Nurse Specialist student, The Johns Hopkins University School of Nursing, Baltimore, MD. Project: "Developing the Role of an Acute Pain Care Nurse in the Emergency Department."

Instructor / Lecturer

2018 CUSP Workshop (international), 30 inter-professional students, Moinhos de Vento Hospital, Porto Alegre, Brazil

2017 Teamwork/Communication Simulation Instructor, Fundacion Santa Fe de Bogota, Polytrauma Management: A Team Approach Conference, Bogota, Colombia.

2017-present CUSP Workshop (civilian and Navy classes), 20-60 inter-professional students per class, Armstrong Institute for Patient Safety and Quality, Baltimore, MD.

2017-present	CUSP Coaching Calls (civilian and Navy cohorts), Armstrong Institute for Patient Safety and Quality, Baltimore, MD.
2012-present	TeamSTEPPS Fundamentals Course, quarterly training, approximately 20 inter-professional students per class, The Johns Hopkins Hospital, Baltimore, MD
2011-present	De-escalation Training for the Emergency Department; offered periodically for new staff, 5-20 inter-professional students per class, The Johns Hopkins Hospital, Baltimore, MD
2009-present	"Safety in the ED;" quarterly training, 4-15 inter-professional students, The Johns Hopkins Hospital, Baltimore, MD
2010	TeamSTEPPS Master Trainer Course, 10 inter-professional students, The Johns Hopkins Hospital, Baltimore, MD
2007	Invited Lecturer: "Evidence Collection and Preservation," Fundamentals of Forensic Nursing course (NR100.628), The Johns Hopkins University School of Nursing, Baltimore, MD