After the Murder: An Analysis of Sexual Homicide Cases Where the Body is Naked and Openly Disposed

by

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Abstract

Research on the post-crime behaviours of sexual homicide offenders (SHOs) has primarily focused on their movement patterns during the disposal of the victim's body. The current study examines what crime scene characteristics are associated with two common disposal methods – naked and open disposal – regardless of whether the body was transported or not. Results from the sequential regression indicate that foreign object insertion, dismemberment, and post-mortem sex is predictive of not openly displaying the body, while overkill is more likely to lead to the body being openly displayed. Further, a vulnerable victim is less likely to be openly displayed. The sadistic behaviours of sexual penetration, asphyxiation, and removing evidence from the scene were predictive of naked disposal. In contrast, the body was more likely to be disposed clothed in cases with a deserted crime scenes and stranger victims, which is indicative of an angry offender. Implications for investigative practices are discussed.

Keywords: sexual homicide; body disposal; typologies; sadism; crime scene analysis; behaviours.

Dedication

To my mom, who is always there to pull me out of the rabbit hole.

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Chapter 1.

Introduction

Body disposal methods, amongst other crime behaviours, can lead to sustained and oftentimes sensationalized media attention, especially if the offender utilizes bizarre or unusual means of disposal (Fleming, 2007). An example of this is seen with the Robert Pickton case. Pickton claimed to dispose of his murder victims by way of a rendering plant, which is typically used to recycle unused animal parts from a slaughterhouse (*R v Pickton*, 2010, SCC 32; Reid & Lee, 2018). This was a unique method of disposal that not only evoked considerable fear and disgust amongst the general public, but also proved to be especially challenging for police in their investigation. Identifying serial or sexual homicide cases from missing persons cases can prove to be difficult for investigators as they have little physical evidence to build a probable case around (LePard et al., 2015). Such was the problem with Pickton – in butchering his victims, he further complicated the investigation by severely limiting the evidence police could find to apprehend him.

An analysis of this case suggests the importance of looking at the disposal method as an extension of the offender because the site and manner of disposal may be indicative of particular offender traits. For Pickton, his manner of disposal reflected how he dehumanized his victims and had enough awareness to avoid detection despite committing a series of homicides (Beauregard, 2018). Therefore, it is important for law enforcement to utilize the information they do have access to in the most effective way possible to expedite the investigative process and identify the unknown offender. One such piece of information they are commonly privy to is the body disposal site, however there is a paucity of research on this vital crime location and the associated post-crime behaviours of sexual homicide offenders (Chai et al., 2021).

While research on SHOs has been growing in recent years, with a shift from typological classifications to an exploration of the different crime phases, the focus has still been primarily on the pre-crime and crime phases (Canter & Wentink, 2004; Schlesinger, 2021). Only recently has research on sexual homicide made a push to consider the entirety of the criminal event. Morton and colleagues (2014) discussed the implications of such research on body disposal methods and the information that can be

gleaned from how a body was disposed. It is typically the location that law enforcement first encounters, and can potentially be indicative of valuable information regarding the nature of the crime, the level of criminal expertise exhibited by the offender, and the offender-victim relationship. As evidenced by the work of Morton et al. (2014) and other scholars, body disposal research is almost exclusively based on the decision to transport the body to a new disposal scene or not, in addition to the end result of how exactly it is disposed (e.g., transported and concealed in water, not transported and left as is; Beauregard & Field, 2008; Sea & Beauregard, 2018). Little empirical work has looked exclusively at the scene irrespective of whether the body was moved prior, despite reports that disposing of the body openly with no attempts to hide or conceal is frequently encountered by investigators (Morton et al., 2014). Looking at the particular method of disposal is especially important with sexual homicide as the victim being naked is one of the most crucial determining factors when defining the type of homicide that took place and deciding what route to go with the investigation (Ressler et al., 1988). The victim's attire or lack of attire is often listed as the first criteria to look for when investigating whether an unsolved homicide is indeed sexual, especially when basing the crime scene analysis on the FBI's definition of sexual homicide (Ressler et al., 1992). While sexual acts during a homicide might necessitate a naked victim, there are cases where the victim's disposal might not clearly reflect the sexual nature of the homicide. Failing to consider extenuating circumstances that might also contribute to a naked victim could lead to the misclassification of the homicide, which could potentially result in errors when solving the case and in turn slow down an important investigation. Despite being an integral piece of information on sexual homicide, it has not been examined on its own regarding what additional information can be gleaned from a naked disposal (Geberth, 2010; Ressler et al., 1992).

Many studies have determined that key modus operandi (MO) characteristics can be uncovered at the body disposal site, and this has established the importance of a more thorough understanding of post-crime behaviours (e.g., Beauregard & Field, 2008; Chai et al., 2021; Morton et al., 2014). By examining one of the definitive pieces of information available to law enforcement at the crime scene – how the victim's body was disposed of – this study aims to fill the gap regarding how particular offender behaviours and crime characteristics may be associated with openly displaying the body and disposing of the body naked.

Chapter 2.

Literature Review

2.1. Understanding Sexual Homicide

Homicides alone are a fairly objective crime to analyze as it is typically clear what has occurred just by looking at the scene. Sexual assaults are more difficult to determine, partly due to the lack of a universal definition (Chan & Heide, 2009; Kerr et al., 2013). Both crimes come together with sexual homicides, making it a crime full of nuance and subjectivity. Several definitions have been put forward to address the concerns around standardizing this crime. Lust murder was one of the first definitions and traces back to the seminal work by Kraft-Ebbing (1965). His contributions on deviant sexual interests and sexual sadism led to him determining that if there is evidence of genital mutilation beyond what would be found in most sexual assault cases, and when there are signs of additional body mutilation or dismemberment, the murder was out of lust (Kraft-Ebbing, 1965).

Researchers at the FBI also contributed to the literature with their own views on what a sexual homicide was, which they then built on in their typological research (Ressler et al., 1986; Ressler et al., 1992). Their definition deems a homicide sexual in nature if one or more of the following are evident at the crime scene: a) the victim is partially or completely naked, b) the genitals are exposed, c) the victim's body was posed in a sexual position, d) objects were found inserted into various body cavities, d) oral, anal, and/or vaginal intercourse occurred, and e) evidence of substitute sexual activity or sadistic fantasy, like masturbation or genital mutilation, was found. Even though countless subsequent definitions have been formed, this continues to be one of the most widely used definitions to date for research on the topic and investigations of these crimes alike (Chan & Heide, 2009; Kerr et al., 2013). While some have added the stipulation that at least two of the original criteria need to be met instead of one (e.g., Chopin & Beauregard, 2019), many continue to require only one of the standards be met. The condition of nakedness is fundamental as it is arguably one of the most blatant to note at the scene. However, this key component to such a widely used definition has

yet to be carefully examined, despite the serious implications that can come with misclassifying a homicide as sexual based strictly on whether the victim is naked alone.

Following the efforts of defining sexual homicide, many turned to categorizing those who committed the act. Some of the earliest work that discussed body disposal in sexual homicide was through the development of typologies that included traits associated with their post-crime behaviours. The numerous classification attempts for SHOs is one area of research where the importance of understanding post-crime behaviours and body disposal is evident, as many of these typologies include some mention of how the particular offender in that group will dispose of the body. However, there remains a limited amount of knowledge on the post-crime phase of these sexual murders. It is apparent that a continuation of past scholars' work is needed to better understand the post-crime behaviours of SHOs, as knowing what certain disposal methods might indicate about an unknown offender can begin to help law enforcement narrow down details about the individual.

The organized-disorganized dichotomy outlined by Ressler and colleagues (1986; 1992) at the FBI noted differences in body disposal methods between these two types of offenders. Most notable, organized SHOs were more likely to plan multiple aspects of their murder, including the disposal method. They often attempted to hide the body and were more likely to transport the corpse to a different site for disposal. On the other hand, leaving the body in plain sight at the crime scene was more commonly seen with disorganized SHOs (Beauregard & Proulx, 2002; Canter et al., 2004; Ressler et al., 1986). The geographically stable versus geographically transient categorization was the first to divide these offenders based on distinct hunting patterns and mobility during the crime-commission process (Holmes & DeBurger, 1985; Holmes & Holmes, 1998). Geographically stable offenders who remained in the same location where they committed their crimes were more likely to transport the body to a carefully pre-selected disposal site, while geographically transient types kill while they are on the move or in transit and therefore transported the body as a means to hide it. This expanded on the typology from the FBI researchers as it looked more closely at the locations associated with the offender, and how they can influence the subsequent crime (Holmes & DeBurger, 1985; Holmes & Holmes; 1998).

More recently, sadistic and angry typologies were discussed by Beauregard and Proulx (2002) for non-serial SHOs, which mirrored the work done at the FBI – while

including several pre-crime and post-crime factors. The sadistic offender was reminiscent of the organized offender, as they engaged in acts of humiliation through torture, which aided in fulfilling their deviant sexual fantasies, and often hid the victim's body, sometimes even dismembering it as a method of disposal. Leaving the corpse at the crime scene, with the victim lying on their back, was more indicative of the angry offender which, much like the disorganized offender, reflects their lack of premeditation (Beauregard & Proulx, 2002). In their study aimed to empirically test the angry and sadistic typology, Chai and colleagues (2021) discovered that post-crime behaviours showed significant associations with the three classes of sexual homicide offenses they identified. This finding suggests the importance of examining behaviours that occurred after the crime has been committed, such as the body disposal methods, in order to better differentiate between sexual homicide typologies.

2.2. Body Disposal in Sexual Homicide

More current research on body disposal has expanded beyond the classification of offenders into typologies and instead shifted focus to the study of specific examination of this particular crime scene behavior. Some of the most essential information about a sexual homicide can be learned when examining the body disposal methods of an offender. In fact, it could be argued that the victim's body is the most integral piece of evidence during investigations (Dibiase, 2015). Using the more easily observable traits and conclusive analyses of body disposal methods to inspect sexual homicides is lacking, despite the wealth of knowledge this post-crime behaviour can tell investigators when they first encounter the victim's body, such as offender expertise and their familiarity with the victim (Killam, 1990). Much of the previous work on body disposal has examined a specific component of the disposal itself, namely if the body was moved or transported post-mortem to a new scene.

Beauregard and Field (2008) examined the influence of situational factors and offender characteristics on whether or not the murderer moved the victim's body after the homicide. Their findings showed additional support for the use of body disposal methods as part of the criminal profile. In their sample, offenders who moved the body exhibited behaviours congruent with the organized typology; additional research had similar findings that supported the claim that offenders who were in control of the crime and appeared methodical in their approach to the homicide were more likely to transport the

body (Beauregard & Proulx, 2002; Canter et al., 2004; Ressler et al., 1986; Ressler et al., 1992). In comparison, offenders who exhibited impulsive and excessively violent behaviours were more in line with the disorganized typology and, therefore, likely to leave the body at the crime scene (Beauregard & Field, 2008; Beauregard & Proulx, 2002; Ressler et al., 1986). Moving the body in itself could also be a precautionary strategy utilized to delay discovery and further distance themselves from the crime (Beauregard & Martineau, 2012). Forensic awareness strategies are a vital facet of an offender's modus operandi (MO) as they can indicate the level of criminal expertise of the SHO, in addition to their evolving sophistication if changes in the MO are noted (Beauregard & Bouchard, 2010; Beauregard & Martineau, 2012; Chopin et al., 2020). While there are commonalities and a general consensus on many of the characteristics of the MO, the subtle differences and unique acts are particularly important to note. They can be the most revealing of who an unknown offender is, or at the very least help investigators narrow down their suspect pool to a more manageable size, despite their infrequency in most cases (Beauregard & Martineau, 2012).

Morton et al. (2014) further addressed this gap in the literature with their unique approach to categorizing serial murderers based on body disposal patterns. The body disposal site is often the first contact law enforcement officers have with the offender. They can begin to parse out details about the killer based on the crime scene characteristics. It is typically one of the only locations known to investigators and acts as the culmination of the homicide; therefore, it is essential to understand other details about the offender (Lundrigan & Canter, 2001). For instance, the relationship between the victim and offender could be shown by how the victim’s body is disposed of, and the various scenarios of body disposal can help narrow down the criminal expertise of the offender (Morton et al., 2014). These authors identified four distinct pathways for body disposal in their study based on the unique offender, victim, and crime scene characteristics: transported from the murder site and concealed (either on the surface, such as having a tarp thrown over the corpse, in water, or buried), transported from the murder site and dumped, concealed at the murder site (again either on the surface, in water, or buried), and left “as is” at the murder site (Morton et al., 2014). While informative, this vital research lacks thorough empirical testing. Most studies followed the Morton et al. (2014) paper focusing on whether the victim’s body was transported following the homicide or left at the crime scene.

Sea and Beauregard (2018) used MO characteristics to look at the relationship between spatial-temporal factors and how the victim's body was disposed of amongst a sample of 54 Korean SHOs. They found that offenders would dispose of the body in an area with which they were familiar and keep within a certain geographic area where they were comfortable if they did decide to move the body, which was typically not far away from the crime scene. Because of the known impact of body disposal on investigations, Reale and Beauregard (2019) looked at how disposal methods impacted the clearance rates of sexual homicide cases; namely, the likelihood that the victim's body would be recovered before or after the crucial 48-hour mark of an investigation. In particular, they analyzed the impact of forensic awareness and other MO characteristics concerning body disposal. If an offender adopted a MO that consisted of deliberate strategies of detection avoidance, then their victim's bodies were often found after 48 hours (Reale & Beauregard, 2019).

In more recent work, the differences in body disposal patterns between solved and unsolved sexual homicide cases in Canada was studied by Chai and colleagues (2021). The emphasis on these distinctions between cases was partially based on whether the body was moved post-homicide, as moving the body was seen more in solved cases where the victim was a sex worker and concealed. In contrast, sex worker victims and recovering the body outdoors were more commonly seen with unsolved cases, and indicated the body was moved. Crime and post-crime factors were also found to be important at predicting transportation as it relates to disposal (Chai et al., 2021). When looking at the aforementioned studies, it is evident that many crime scene characteristics indicative of the offender's MO have been examined concerning various sub-topics within the realm of body disposal.

Studies on solved versus unsolved cases, geographic information and decisions around crime locations, body recovery times, and more have further emphasized the role the MO plays throughout the entire crime, with particular emphasis given to the role during the post-crime phase and body disposal methods (e.g. Beauregard & Field, 2008; Lundrigan & Canter, 2001; Reale & Beauregard, 2019). Additionally, the typification of sexual offenders based on body disposal information is evident. However, it is also clear that previous research has focused almost solely on the *movement* of the SHO by examining such things as their hunting patterns, transportation of the body post-mortem,

and spatial mobility of an unknown offender (e.g. Holmes & DeBurger, 1985; Sea & Beauregard, 2018).

2.3. Openly Disposing of the Body

Regardless of these findings, there appears to be no studies that have directly investigated the relationship between specific ways the body is disposed of and other crime characteristics. The site where the body was disposed of is argued to be one of the most important for investigators to look at because it is the only scene where they can say for certain the offender and the victim were at together. As stated previously, it is one of the first known locations law enforcement have access to when beginning their investigation, so having a more well-rounded understanding of the body disposal and thoroughly analyzing this post-crime behaviour in its entirety is crucial (Beauregard & Field, 2008; Lundrugan & Canter, 2001; Morton et al., 2014). However, much of the previous research on body disposal has focused on the movement to and from the disposal site and examined specifically how the transportation of the body is impacted by various factors related to the sexual homicide.

Morton et al. (2014) found that openly disposing of the body, leaving it “as is,” or dumping the body with little concern to conceal it, is the most common method of body disposal used by SHOs. Openly disposing of the victim’s body could be explained by a few different schools of thought, the first being that it is in line with the SHOs deviant and sexually sadistic fantasies. Leaving the body in an open position could be used as a means to shock the public or otherwise instill fear in the public, which the offender may find to be sexually gratifying (Hazelwood & Douglas, 1980; Kaplan, 2007). It could also reveal how the victim-offender relationship works, as openly disposing of and making no effort to conceal the body has been seen in cases where the offender has a disregard for the victim due to how they perceive them. For example, sex workers and members of other marginalized groups may be dumped or placed in sexually-explicit positions due to the offender having complete disregard for them. They utilize the disposal method to showcase how they really feel about the victim – going beyond just degrading and killing them, and using additional post-crime behaviours to humiliate them even more after death (Beauregard & Mieczkowski, 2012).

Alternatively, openly displaying the body may not be a purposive act to shock or demonstrate the offender’s feelings towards the victim, but rather more of a reaction to

situational factors. A situational approach to examining the post-crime actions of the SHO can further aid in explaining the decision-making process around their body disposal methods (Beauregard & Leclerc, 2007). If an offender needs to flee the scene or leave immediately post-homicide, the body may be left in an open position as they did not have time to even attempt to hide or conceal the body (Bateman, & Salfati, 2007). This could then mean that the way investigators find the body may not be how the offender intended them to find it as they did not have the time to dispose of it the way they planned. Instead, their decisions regarding the disposal were inhibited due to external circumstances surrounding the crime (Beauregard & Leclerc, 2007; Chopin et al., 2020). Caution must therefore be exercised when using the body disposal method and display of the body as an investigative tool for profiling an unknown SHO, as the initial explanation for why a victim was disposed of the way that they were might not be entirely accurate or fully indicative of who the offender may be (Douglas & Munn, 1992).

2.4. Naked Disposal

Furthermore, the general criticism of using broad determining factors when defining sexual homicide has yet to be addressed. Research on sexual homicide has shown that having a thorough understanding of the crime scene and disposal site can assist investigators, but clear evidence of a sexual act is not always easily ascertained at these scenes for a variety of reasons. To determine the sexual aspect of the homicide, many in research and law enforcement rely on the definition put forth by Ressler and colleagues (1992) despite it having limited empirical validation (Carter et al., 2017). While the FBI definition offers a framework for what to look for in these cases, it has been critiqued in the past for sometimes leading to incorrect determinations of the type of homicide and being overly inclusive (e.g., Kerr et al., 2013; Stefanska et al., 2020). In addition, the individual criteria that comprise the definition may vary in how clearly they are observed at the scene, which could lead to a misinterpretation of evidence (Carter et al., 2017). Namely, the first criterion of attire or lack of attire is especially difficult to use alone due to the wide-ranging reasons a body may be found naked that are not sexual. The risk of error when investigating sexual crimes is exacerbated by their complexity and uniqueness, so validating the pre-existing measures that are already utilized for these cases can assist in minimizing these errors and ensure appropriate hypotheses are made (Chopin & Beauregard, 2021).

The study by Liu and Pollanen (2017) illustrates the risks around using only the lack of clothing to determine motive. A female victim was found naked in a sexually suggestive position, prompting those at the scene to presume it was a sexually-motivated homicide. However, after conducting a careful death investigation and forensic analysis, it was determined that the victim could have in no way died due to sexual homicide. In this case, the victim being naked was offered as circumstantial evidence to suggest a sexual crime had occurred. The authors summarize the issue with this by saying that this type of evidence can be helpful in investigations, but "if taken too far, can hinder discovery of truth" (Liu & Pollanen, 2017, p. 214). Nakedness is quick to see and many law enforcement personnel are confident that when the victim is found fully or partially naked, they are dealing with a sexually-motivated murder (Geberth, 2010). These observable characteristics of the scene and condition of the body are key when deciding the direction of an investigation, yet they can be skewed in the wrong direction if the type of homicide is misclassified after one look at the crime scene (Craun et al., 2022). While some components of the Ressler et al. (1992) definition might be more reliable at determining a sexual homicide, they also take more time and analysis to determine. For instance, inserting foreign objects into the victim might not be readily noticeable upon first glance at the scene, and evidence of sexual penetration is usually determined by a medical professional sometime after the body has been recovered.

Chapter 3.

The Current Study

This study builds upon the foundation set forth by Morton et al. (2014) and several of the aforementioned authors on body disposal research, to test if certain crime scene analysis indices and offender behaviours could be used to predict the manner of body disposal. In doing so, more accurate information about an offender can be uncovered when investigating crimes with these particular disposal methods, as studying the manner in which the body is disposed goes one step further, after the body has been moved post-mortem or not. Beauregard and Field (2008) note that measures of distance when disposing of the body might be beneficial to study to some extent, but they might also not be consistently useful as not all offenders move the body as part of their disposal. Additionally, determining if and why the body was moved can be a difficult enough task for investigators. Thus, looking at the body disposal scene regardless of the movement patterns or spatial decisions prior to the disposal is important.

The current study aims to address these concerns and gaps in the literature by exploring what sexual homicide crime scene characteristics are more indicative of two common disposal methods. The first will examine cases where the body is openly displayed, while the second aims to examine naked disposal as opposed to clothed disposal. Previous typological and empirical work has uncovered a link between such characteristics and distinct body disposal patterns (e.g. Beauregard & Field, 2008; Reale & Beauregard, 2019; Ressler et al, 1986). Additionally, it is crucial to note which crime scene behaviours can mean the body will be naked, but perhaps more importantly, what traits will lead to the body not being naked. Especially in sexual homicide, where a naked victim leads many to automatically think there was a sexual component to the crime, knowing what factors are also seen with clothed victims can help with the proper identification of the motive and the type of crime being committed during the early stages of the investigation. Openly displaying the body and leaving the victim naked are frequently encountered by sexual homicide investigators, so ensuring they can adequately assess those scenes could help expedite the process of apprehending the right perpetrator by narrowing down the number of potential suspects (Rossmo, 2000).

Chapter 4.

Methods

4.1. Sample and Procedure

The sample consisted of 662 solved cases of sexual homicide. All cases were extrafamilial in nature, meaning the victim(s) and offender were not related. Data regarding the case information were collected between 1948 and 2017 from both Canada and France. Few offender characteristics were included in the dataset, with the focus being on crime scene behaviours, such as crime locations, MO, violent and sexual acts, as well as victim characteristics. The majority of victims were White (72.2%), and female (84.9%), with a mean age for all victims of 31.4 years (SD = 18.7). Approximately half the sample did not know the offender (47.6%).

Data were obtained from an international database on sexual homicide (the Sexual Homicide International Database; SHIelD), which is maintained by various law enforcement personnel (Chopin and Beauregard, 2019). Crime analysts were responsible for inputting information on the sexual homicide that is compiled from such documents as police reports, forensic evaluations, and interviews, in an attempt to avoid missing data (Chopin and Beauregard, 2019). Cases were defined as a sexual homicide if they met at least two of the criteria set forth by Ressler and colleagues (1988) of the FBI: (a) victim's attire or lack of attire, (b) exposure of the victim's genitals, (c) sexual positioning of the victim's body, (d) evidence of sexual intercourse (i.e., vaginal, anal, oral), (e) insertion of foreign objects in body cavities (i.e., vagina, anus, mouth), and (f) evidence of substitute sexual activity or sadistic fantasy (e.g., masturbation, genital mutilation). Even though most studies only require one of the items be met to classify a case as a sexual homicide, requiring at least two of the items to be observed has been found to reduce the risk of false positives and further validate this classification (Chopin and Beauregard, 2019).

4.2. Measures

Dependent variable: In the first study, the dependent variable was dichotomized into openly displayed ("1") and not openly displayed ("0"). Openly displayed victims were

found in 48.8% (n = 323) of cases and those not openly displayed were in 51.2% (n = 339) of cases. For the purposes of this study, openly displaying the body includes cases where the offender displayed the body in a way that would ensure discovery. A body that was not openly displayed was one in which there was evidence of attempts to hide or cover the body, or otherwise prevent the discovery of the body. The second study explored the differences between cases where the body is found naked or partially naked and those found fully clothed. The dependent variable for the second study was dichotomized based on the state of dress the victim was in when the body was found: naked or partially naked (hereafter referred to as “naked” for simplicity): “1”) and clothed (“0”). Naked victims were found to be present in 52.3% (n = 346) of cases while victims were found clothed in 47.7% (n = 316) of cases. The inclusion of particular independent variables was guided by previous empirical work on body disposal in sexual homicide cases (e.g. Beauregard & Field, 2008; Chai et al., 2021; Reale & Beauregard, 2019). A total of 29 predictor variables were used in the first study, while the second study used 33 variables. These were divided into four sections related to the entirety of an offender’s behaviours during their crime commission process (Table 1).

Table 1. Descriptive Statistics of Crime Scene and Victim Characteristics, with Body Disposal Method.

Variables	Percentage	Frequency (n = 662)
Crime Locations		
CS: deserted	31.4	208
CS: victim residence	26.4	175
CS: outdoors	29.5	195
OS: deserted	48.5	321
OS: victim residence	30.8	204
OS: public building	3.2	21
OS: outdoors	35.3	234
Organized/Disorganized Behaviours		
Mutilate genitals	6.0	40
Sexual acts: penetration	61.8	409
Semen	28.5	189
Foreign object insertion	12.7	84
Post-mortem sex	16.5	109
Used restraints	19.3	128
Violence: beating	45.0	298
Violence: weapon	30.7	203
Violence: asphyxiation	44.7	296
Dismemberment	11.6	77
Overkill	21.9	145
Items taken	38.2	253
Forensic Awareness Strategies		
Precaution: cleaned	6.6	44
Remove or destroy evidence	33.7	223
Precaution: gloved	3.0	20
Precaution: mask	3.8	25
Precaution: condom	3.5	23
Precaution: administer drugs	1.2	8
Other	34.1	226
Victim Characteristics		
Victim was a sex worker	6.9	46
Victim was jogging	24.3	161
Victim was hitchhiking	4.2	28
Victim was homeless	5.9	39
Victim was under the influence	196	196
Victim was living alone	18.3	18.3
Victim was a stranger	47.6	47.6
Victim was targeted	31.7	210
Victim was female	84.9	562
Victim age	31.42[a]	18.67[b]
Body openly disposed	51.2	339
Body naked	52.3	346

CS = contact scene
OS = offense scene
[a]Represents the mean.
[b]Represents the standard deviation.

Independent variables: crime scene locations. Specific offender motives can be examined based on where they committed their crimes, which shows the importance of crime locations in determining further crime and post-crime behaviours (Beauregard & Martineau, 2012; Holmes & DeBurger, 1985; Lundrigan & Canter, 2001). Seven variables described the crime locations for both studies and were all dichotomously coded ("0" = no, "1" = yes): (a) contact scene was deserted, (b) contact scene was the victim's residence, (c) contact scene was outdoors, (d) offense scene was deserted, (e) offense scene was the victim's residence, (f) offense scene was a public building, and (g) offense scene was outdoors.

Independent variables: modus operandi behaviours. Analyzing observable characteristics of an offender's modus operandi at the disposal site can contribute to the understanding of their motive to commit the crime, and may influence the state the victim's body is in when disposed (Beauregard & Martineau, 2014; Ressler et al., 1986). Several studies have explored these unique behaviours as they relate to various aspects of a sexual homicide, including the body disposal methods (e.g., Beauregard & Martineau, 2014; Koeppel et al., 2019; Ressler et al., 1988). A total of 11 variables were used to encompass these behaviours in the first study, and all were dichotomously coded ("0" = no, "1" = yes): (a) mutilated genitals, (b) sexual penetration (vaginal and/or anal), (c) foreign object insertion, (d) post-mortem sexual activity, (e) offender used restraints, (f) victim was beaten, (g) victim was attacked with a weapon (includes acts of stabbing, cutting or shooting the victim), (h) victim was asphyxiated (includes strangulation and drowning), (i) victim was dismembered, (j) evidence of overkill, and (k) offender took items from the scene/victim. Looking at nakedness, all of the same MO variables were included with the addition of (l) semen being present at the scene, which was also dichotomously coded ("0" = no, "1" = yes).

Independent variables: forensic awareness strategies. The forensic awareness strategies of a sexual offender may be influenced by situational factors and can vary throughout the crime-commission process (Beauregard & Bouchard, 2010). In addition, the level of sophistication or criminal expertise can also be determined by looking at how an offender adapts their MO to avoid detection and apprehension, which in turn can influence their disposal methods (Beauregard & Martineau, 2014; Reale et al., 2020). Five variables indicating an offender's forensic awareness strategies at different stages of the crime were examined: (a) cleaned the crime scene, (b) removed or destroyed

evidence, (c) wore gloves, (d) wore a mask, and (e) other (i.e., staging the scene, acting upon the environment, and protecting their identity) (“0” = no, “1” = yes). The second study used six similar forensic awareness strategies with some exceptions – the wearing a mask was replaced with (f) wearing a condom, and (g) the administration of drugs to the victim was also included, both of which were dichotomously coded (“0” = no, “1” = yes).

Independent variables: victim characteristics. Variables associated with victim characteristics were used as controls in the multivariate analyses. Previous studies have noted the relevance of victim characteristics on offender behaviours throughout the crime, and in turn how they can impact body disposal in sexual murders. For instance, Salfati and colleagues (2008) found differences in disposal methods if the victim was a sex worker, while Beauregard and Field (2008) stated that age of the victim would impact how the body was disposed of. Six variables that encompassed victim characteristics were included as controls: (a) victim age (M = 31.4; SD = 18.7), (b) victim was female, (c) victim was targeted, (d) victim was under the influence (i.e., of drugs and/or alcohol), (e) victim was a sex worker, and (f) victim was hitchhiking, all coded dichotomously (“0” = no, “1” = yes). The second studying looking at naked disposal also saw the inclusion of (g) victim was a stranger, (h) victim was jogging, and (i) victim has a thin build (“0” = no, “1” = yes).

4.3. Analytical Strategy

All statistical analyses were conducted using the Statistical Package for the Social Sciences 26 (SPSS). First, chi-square analyses were run to test for significant associations between the dependent variables and each categorical independent variable. Variables that were significant ($p < .05$) at the bivariate level were included in multivariate models (see Hosmer & Lemeshow, 2013). An independent sample t-test was also run to compare the mean victim age across both outcomes of the dependent variables.

Since both dependent variables had a binary outcome, a logistic regression was used as the multivariate analysis to assess the impact of the independent variables on body disposal, with a sequential model utilized to test the unique effects of crime scene locations, organized and disorganized behaviours, and forensic awareness strategies on cases where the victim’s body was openly displayed or naked after a sexual homicide,

all while controlling for victimology. The order of the variables inputted into the regression followed logical temporal order of sexual homicides, starting with where the offender and victim first make contact, followed by the specific acts the SHO inflicts on the victim, and ending with any detection-avoidance strategies they may take to prevent capture. No multicollinearity was detected after conducting an ordinary least squares (OLS) analysis, as VIF values ranged between 1.05 and 1.37, which is below the acceptable threshold of 5, and tolerance values were all above .20, with .73 being the lowest value; therefore, the assumption was also met (Garson, 2016). Finally, model fit for the regression was assessed by looking at several fit measures, and the predictive ability of the model was determined by the Receiver Operating Characteristics-Area Under the Curve (ROC-AUC) value.

Chapter 5.

Results

Table 2 presents the results of the bivariate analyses between the body being openly displayed or not and the independent variables. Two variables regarding the crime location were found to be significantly associated with how the body was displayed: SHOs who first make contact with the victim in a deserted location were less likely to openly display the body ($p = .006$), but if the offense was committed outdoors, the body was more likely to be openly displayed ($p = .002$). As for the MO behaviours, SHOs who perpetrated acts of foreign object insertion ($p = .001$), post-mortem sexual activity ($p < .001$), used restraints ($p < .001$), dismembered the victim ($p < .001$), and took items from the victim or scene ($p = .013$) were less likely to openly display the body compared to offenders who did not engage in these behaviours. Conversely, SHOs whose victims showed signs of overkill were more likely to dispose of the body openly ($p < .001$). Looking at forensic awareness strategies, SHOs who cleaned the scene as a precautionary measure ($p = .003$), removed or destroyed evidence ($p = .001$), or used other strategies ($p = .010$) were less likely to openly display the body. Several victim characteristics were also significant at the bivariate level. The victim's body was less likely to be openly displayed if they were targeted ($p = .001$, while if the victim was under the influence of drugs and/or alcohol ($p = .003$), a sex worker ($p = .049$), and hitchhiking ($p = .001$), they were more likely to be openly displayed. Lastly, on average, older victims were significantly associated with not openly displaying the body ($p < .001$).

Table 2. Bivariate Analyses for Body Openly Displayed Against Crime Scene and Vicitm Variables (N = 662).

Variables	Body openly displayed (n = 323) M (SD) / % (n)	Body not openly displayed (n = 339) M (SD) / % (n)	χ^2/t, (df), φ/d
Crime Locations			
CS: deserted	26.5 (90)	36.5 (118)	χ^2 (1) = 7.65, φ = -.11**
CS: victim residence	28.3 (96)	24.5 (79)	χ^2 (1) = 1.27, φ = .04
CS: outdoors	31.3 (106)	27.6 (89)	χ^2 (1) = 1.01, φ = .04
OS: deserted	45.1 (153)	52.0 (168)	χ^2 (1) = 3.13, φ = -.07
OS: victim residence	28.9 (98)	32.8 (106)	χ^2 (1) = 1.19, φ = -.04
OS: public building	3.8 (13)	2.5 (8)	χ^2 (1) = .99, φ = .04
OS: outdoors	41.0 (139)	29.4 (95)	χ^2 (1) = 9.72, φ = .12**
Modus Operandi Behaviours			
Mutilate genitals	5.3 (18)	6.8 (22)	χ^2 (1) = .66, φ = -.03
Sexual acts: penetration	59.6 (202)	64.1 (207)	χ^2 (1) = 1.42, φ = -.05
Foreign object insertion	8.6 (29)	17.0 (55)	χ^2 (1) = 10.72, φ = -.13**
Post-mortem sex	8.8 (30)	24.5 (79)	χ^2 (1) = 29.30, φ = -.21***
Used restraints	13.6 (46)	25.4 (82)	χ^2 (1) = 14.81, φ = -.15***
Violence: beating	44.8 (152)	45.2 (146)	χ^2 (1) = .01, φ = -.001
Violence: weapon	31.3 (106)	30.0 (97)	χ^2 (1) = .12, φ = .01
Violence: asphyxiation	43.7 (148)	45.8 (148)	χ^2 (1) = .31, φ = -.02
Dismemberment	6.8 (23)	16.7 (54)	χ^2 (1) = 15.88, φ = -.16***
Overkill	31.0 (105)	12.4 (40)	χ^2 (1) = 33.42, φ = .23***
Items taken	33.6 (114)	43.0 (139)	χ^2 (1) = 6.20, φ = -.10*

CS = contact scene
OS = offense scene
*p < .05. **p < .01. ***p < .001

Table 2. Continued.

Variables	Body openly displayed (n = 339) M (SD) / % (n)	Body not openly displayed (n = 323) M (SD) / % (n)	χ^2/t, (df), φ/d
Forensic Awareness Strategies			
Precaution: cleaned	3.8 (13)	9.6 (31)	χ^2 (1) = 8.85, φ = -.17**
Remove or destroy evidence	27.7 (94)	39.9 (129)	χ^2 (1) = 11.04, φ = -.13**
Precaution: gloves	3.5 (12)	2.5 (8)	χ^2 (1) = .64, φ = .03
Precaution: mask	1.8 (6)	0.6 (2)	χ^2 (1) = 1.84, φ = .05
Other	29.5 (100)	39.0 (126)	χ^2 (1) = 6.65, φ = -.10*
Victim Characteristics			
Victim was targeted	26.0 (88)	37.8 (122)	χ^2 (1) = 10.66, φ = -.13**
Victim was a stranger	49.9 (169)	45.2 (146)	χ^2 (1) = 1.44, φ = .05
Victim was living alone	17.1 (58)	19.5 (63)	χ^2 (1) = .64, φ = -.03
Victim under the influence	34.8 (118)	24.1 (78)	χ^2 (1) = 9.02, φ = .12**
Victim was a sex worker	8.8 (30)	5.0 (16)	χ^2 (1) = 3.88, φ = .08*
Victim was hitchhiking	6.8 (23)	1.5 (5)	χ^2 (1) = 11.20, φ = .13**
Victim was jogging	24.2 (82)	24.5 (79)	χ^2 (1) = .01, φ = -.01
Victim was female	86.1 (292)	83.6 (270)	χ^2 (1) = .84, φ = .04
Victim age	29.42 (16.66)	33.52 (20.34)	*t*(622.01) = 2.83, d = 0.22***

*p < .05. **p < .01. ***p < .001

The results of the bivariate analyses between the independent variables and the body being disposed naked are presented in Table 3. Three crime locations were found to be significantly associated with how the body was found. If the contact scene is deserted ($p = .001$) or contact first occurs at the victim's residence ($p = .004$), the body is less likely to be found naked, whereas if the offense takes place at the victim's residence ($p = .008$) the body is more likely to be naked. Several variables related to the modus operandi were also significantly associated with the disposal of the body: genital mutilation ($p = .021$), vaginal and/or anal penetration ($p < .001$), semen left at the scene ($p = .005$), the use of restraints ($p = .017$), and death by asphyxiation ($p = .001$) were all associated with a greater likelihood of disposing of the body naked. Additionally, the unique acts of dismemberment ($p < .001$), overkill ($p = .013$), and taking items from the scene or victim ($p < .001$) were also more likely to result in the victim being found naked. There was also an association between forensic awareness strategies and the state of undress of the victim. More specifically, if the offender removed or destroyed evidence ($p < .001$) and administered drugs to the victim ($p < .001$), the body was more likely to be found naked. Looking lastly at the victim characteristics, stranger victims ($p = .015$) were less likely to be found naked, however, if victims were under the influence of drugs and/or alcohol ($p < .001$) and had a thin build ($p = .043$), they were more likely to be naked.

Table 3. Bivariate Analyses for Body Disposed Naked Against Crime Scene and Victim Variables (N = 662).

Variables	Body disposed naked (n = 346) M (SD) / % (n)	Body disposed clothed (n = 316) M (SD) / % (n)	χ^2/t, (df), φ/d
Crime Locations			
CS: deserted	25.7 (89)	37.7 (119)	χ^2 (1) = 10.92, φ = -.13**
CS: victim residence	21.7 (75)	31.6 (100)	χ^2 (1) = 8.44, φ = -.11**
CS: outdoors	29.5 (102)	29.4 (93)	χ^2 (1) = .00, φ = .001
OS: deserted	48.3 (167)	48.7 (154)	χ^2 (1) = .02, φ = -.01
OS: victim residence	26.3 (91)	35.8 (113)	χ^2 (1) = 6.93, φ = -.10**
OS: public building	42.9 (9)	57.1 (12)	χ^2 (1) = .77, φ = -.03
OS: outdoors	37.6 (130)	32.9 (104)	χ^2 (1) = 1.57, φ = .05
Modus Operandi Characteristics			
Mutilate genitals	8.1 (28)	3.8 (12)	χ^2 (1) = 5.37, φ = .09*
Sexual acts: penetration	72.3 (250)	50.3 (159)	χ^2 (1) = 33.66, φ = .23***
Semen	33.2 (115)	23.4 (74)	χ^2 (1) = 7.81, φ = .12**
Foreign object insertion	15.0 (52)	10.1 (32)	χ^2 (1) = 3.58, φ = .07
Post-mortem sex	18.8 (65)	13.9 (44)	χ^2 (1) = 2.84, φ = .07
Used restraints	22.8 (79)	15.5 (49)	χ^2 (1) = 5.68, φ = .09*
Violence: beating	47.1 (163)	42.7 (135)	χ^2 (1) = 1.29, φ = 0.4
Violence: weapon	32.4 (112)	28.8 (91)	χ^2 (1) = .99, φ = .04
Violence: asphyxiation	50.6 (175)	38.3 (121)	χ^2 (1) = 10.09, φ = .12**
Dismemberment	15.9 (55)	7.0 (22)	χ^2 (1) = 12.83, φ = .14***
Overkill	25.7 (89)	17.7 (56)	χ^2 (1) = 6.18, φ = .10*
Items taken	45.7 (158)	30.1 (95)	χ^2 (1) = 17.03, φ = .16***

CS = contact scene
OS = offense scene
*p < .05. **p < .01. ***p < .001.

Table 3. Continued.

Variables	Body disposed naked (n = 346) M (SD) / % (n)	Body disposed clothed (n = 316) M (SD) / % (n)	χ^2/t, (df), φ/d
Forensic Awareness Strategies			
Precaution: cleaned	6.9 (24)	6.3 (20)	χ^2 (1) = .10, φ = .01
Remove or destroy evidence	44.2 (153)	22.2 (70)	χ^2 (1) = 36.01, φ = .23***
Precaution: gloves	2.9 (10)	3.2 (10)	χ^2 (1) =.04 , φ = -.01
Precaution: condom	2.6 (9)	5.1 (16)	χ^2 (1) = 2.76, φ = -.07
Precaution: administer drugs	6.1 (21)	0.6 (2)	χ^2 (1) = 14.56, φ = .15***
Other	33.8 (117)	34.5 (109)	χ^2 (1) = .03, φ = -.01
Victim Characteristics			
Victim was targeted	30.1 (104)	33.5 (210)	χ^2 (1) = .93, φ = -.04
Victim was a stranger	43.1 (149)	52.5 (166)	χ^2 (1) = 5.94, φ = -.10*
Victim was living alone	15.6 (54)	21.2 (67)	χ^2 (1) = 3.46, φ = -.07
Victim under the influence	36.1 (125)	22.5 (71)	χ^2 (1) = 14.78, φ = .15***
Victim was a sex worker	7.2 (25)	6.6 (21)	χ^2 (1) = .09, φ = .01
Victim was hitchhiking	5.5 (19)	2.8 (9)	χ^2 (1) = 2.85, φ = .07
Victim was jogging	22.3 (77)	26.6 (84)	χ^2 (1) = 1.68, φ = -.05
Victim had a thin build	42.5 (147)	34.8 (110)	χ^2 (1) = 4.10, φ = .08*
Victim was female	86.7 (300)	82.9 (262)	χ^2 (1) = 1.85, φ = .05
Victim age	29.72 (17.64)	33.29 (19.60)	*t*(660) = 2.47, d = .19

*p < .05. **p < .01. ***p < .001.

Table 4 presents the findings of the sequential logistic regression involving how the body was displayed after the sexual homicide (i.e., openly or not). According to Model 1, if an offender first contacts the victim at a deserted location compared to one that is not, they are 38.20% less likely to openly dispose of the victim's body (OR = .62 p = .005). Additionally, offense scenes that are outdoors are 1.69 times more likely to lead to the victim's body being openly disposed of when compared to indoor locations (OR = .17; p = .002). This first model is below poor in model accuracy, with a ROC-AUC value of .58 (p < .001) (Figure 2; Garson, 2016). The introduction of MO behaviours shows the classification accuracy improve to 65.7%. Crime scene locations changed to non-significant, while many of the behaviours were found to be significant. An offender who inserts foreign objects into the victim is 50.10% less likely to openly display the body compared to an offender that does not (OR = .50; p = .012). Offenders who engaged in post-mortem sexual behaviour were 68.50% less likely to dispose of the victim's body openly (OR = .32; p < .001) compared to those who do not perform such acts; moreover, using restraints compared to not using restraints reduced the odds of openly displaying the victim's body by 51.40% (OR = .49; p = .001). The dismemberment of the victim's body indicated that an offender is 58.50% less likely to dispose of the body openly (OR = .42; p = .002), and taking items from the crime indicated they are 34.70% less likely to openly dispose of the body compared to offenders who do neither (OR = .65; p = .016). Conversely, victims who show signs of overkill are 3.26 times more likely to be openly displayed (OR = 3.3; p < .001) compared to victims that did not show signs of overkill. Model 2 improves in predicting openly displaying the body with a ROC-AUC value of .72 (p < .001) (Garson, 2016).

Model 3 considers forensic awareness strategies in addition to crime location factors and MO behaviours, and saw the classification accuracy continue to improve to 66.80%. All but one of the variables that were significant in the previous model remained significant with the inclusion of variables related to forensic awareness strategies; however, none of the new FAS variables were found to be significant. SHOs who perpetrated the insertion of foreign objects and post-mortem sexual activity were 49.00% less likely (OR = .51; p = .016) and 67.70% less likely (OR = .32; p < .001) to dispose of the victim's body openly compared to those who do not perform such acts, respectively. The use of restraints reduced the odds of openly displaying the body by 51.20% compared to not using restraints (OR = .49; p = .002), while dismemberment of the victim's body reduced the odds of openly displaying the body by 56.60% (OR = .43; p =

.003) compared to not dismembering the body. Again, acts of overkill increased the odds of openly displaying the body by 3.22 times compared to no such acts (OR = .32; $p < .001$). The model performance has marginal improvements in predictive ability with a ROC-AUC value of .73 ($p < .001$) (Garson, 2016).

Model 4 considers victimology characteristics in addition to the MO variables. Interestingly, none of the crime locations or forensic awareness strategies were significant predictors of openly disposing of the body after a sexual homicide. Several of the acts performed on the victim remained significant and reduced the odds of openly displaying the body compared to not performing these acts: foreign object insertion reduced the odds by 50.80% (OR = .49; $p = .016$), post-mortem sex by 66.90% (OR = .33; $p < .001$), using restraints by 45.20% (OR = .55; $p = .011$), and dismemberment by 60.70% (OR = .39; $p = .001$). An increase of 303.00% in the odds of openly displaying the body was seen with acts of overkill compared to no overkill (OR = .30, $p < .001$). The new victim variable noting if the victim was under the influence was 1.85 times as likely to lead to openly displaying the body versus not (OR = .19; $p = .003$), whereas if the victim was hitchhiking, the odds rose to 3.12 times (OR = .31; $p = .032$). Classification predicted accuracy improved again to 68.10%; therefore, the final model improved in classification accuracy from the null model by a total of 14.20%. The largest improvement in predicted accuracy came with the addition of organized and disorganized behaviours with an increase of 11.80%, while other models saw comparatively smaller improvements, though accuracy increased, nonetheless. Lastly, the performance of the model is adequate at predicting if the victim's body will be openly displayed according to the ROC-AUC value of .75 ($p < .001$) (Figure 2; Garson, 2016).

Table 4. Sequential Logistic Regression Predicting Openly Displaying the Body.

Variables	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
Crime Locations				
Contact scene: deserted	.62 (.44, .86)**	.72 (.50, 1.03)	.74 (.51, 1.01)	.79 (.54, 1.14)
Offense scene: outdoors	1.69 (1.22, 2.34)**	1.41 (.99, 2.00)	1.37 (.96, 1.96)	1.22 (.84, 1.78)
Modus Operandi Behaviours				
Foreign object insertion		.50 (.29, .86)*	.51 (.30, .88)*	.49 (.28, .88)*
Post-mortem sex		.32 (.19, .52)***	.32 (.20, .53)***	.33 (.20, .55)***
Used restraints		.49 (.32, 75)**	.49 (.31, .76)**	.55 (.35, .87)*
Dismemberment		.42 (.24, .72)**	.43 (.25, .76)**	.39 (.22, .70)**
Overkill		3.26 (2.11, 5.04)***	3.22 (2.01, 5.00)***	3.03 (1.94, 4.74)***
Items taken		.65 (.46, .92)*	.70 (.49, 1.01)	.69 (.47, .1.00)
Forensic Awareness Strategies				
Precaution: cleaned			.60 (.28, 1.29)	.61 (.28, 1.33)
Remove or destroy evidence			.80 (.54, 1.20)	.72 (.47, 1.10)
Other			.99 (.68, 1.44)	1.14 (.77, 1.69)
Victim Characteristics				
Victim targeted				.83 (.56, .1.24)
Victim under the influence				1.85 (1.23, 2.77)**
Victim was a sex worker				1.31 (.65, 2.62)
Victim was hitchhiking				3.12 (1.10, 8.82)*
Victim age				.99 (.99, 1.00)
Constant	1.02	1.57**	1.69**	1.72*
χ^2	17.86***	111.98***	116.80***	136.81***
Nagalkerke R^2	.04	.21	.22	.25
Overall % predicted	53.9	65.7	66.8	68.1

*p < .05. **p < .01. ***p < .001.

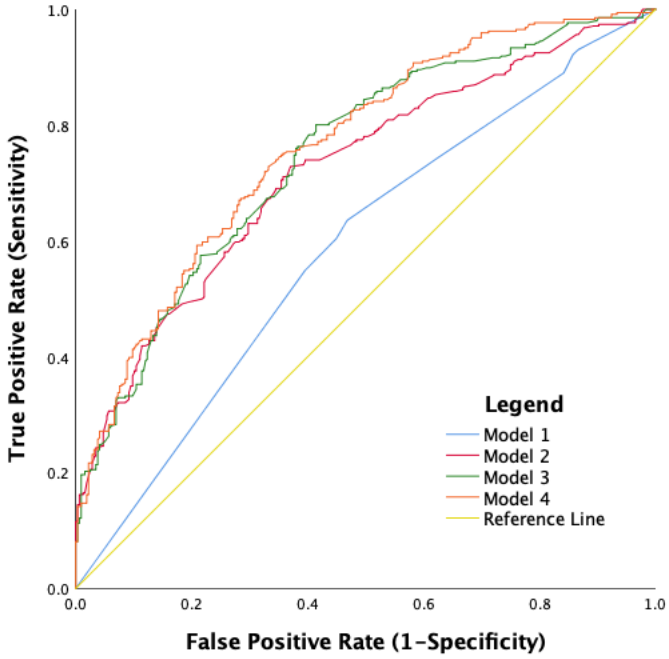

Figure 1. ROC-AUC for All Models with Openly Displayed Disposal.

Table 5 presents the results of the sequential regression that examined the state of undress of the body when disposed of after a sexual homicide. Model 1 began with a classification accuracy of 58.60%, with deserted contact scenes decreasing the odds of the body being naked by 39% compared to scenes that are not deserted (OR = .61; p = .003). The ROC-AUC value was .59 (p < .001), which is below poor for model accuracy (Figure 2; Garson, 2016). Model 2 continues to see deserted contact scenes decreasing the odds of being found naked by 34% (OR = .66; p = .028), and includes several significant modus operandi characteristics, increasing the classification accuracy to 67.50%. Offenders who engaged in sexual penetration (OR = 2.58; p < .001) are about 2.5 times more likely to dispose of the body naked compared to those that do not have sex with the victim, while offenders who use restraints and kill by asphyxiation are both approximately 1.5 times more likely to leave the victim naked (OR = 2.58; p < .001 and OR = 1.59; p = .036, respectively). Additionally, dismemberment increased the odds of the victim being naked by 319% (OR = 3.19; p < .001), overkill by 182% (OR = 1.82; p = .005), and taking items after the crime by 187% (OR = 1.87; p < .001), compared to cases where these behaviours do not occur. The model accuracy improved with a ROC-AUC value of .72 (p < .001) (Garson, 2016).

When introducing forensic awareness strategies in Model 3, two strategies were found to be significant, while all previously significant crime locations and modus operandi characteristics remained so as the classification accuracy rose slightly to 67.70%. Deserted contact scenes reduced the odds of the body being naked by 41% compared to contact scenes that are not deserted (OR = .59; p = .007). Sexual homicides that included penetration (OR = 2.51; p < .001), the use of restraints (OR = 1.66; p = .025), and asphyxiation (OR = 1.61; p = .008) were 2.51 times, 1.66 times, and 1.61 times more likely to result in a naked disposal, respectively. Dismemberment increased the odds of the body being naked by about three times (OR = 3.04; p < .008), while overkill increased the odds by 1.94 times (OR = 1.94; p = .002) and taking items increased the odds by 1.46 times (OR = 1.46; p = .042). Removing or destroying evidence also increased the odds of a naked body disposal by 241%, while administering drugs to the victim increased the odds by 541%, as opposed to those who did not engage in such forensic countermeasures (OR = 2.41; p < .001 and OR = 5.41; p = .031, respectively). Model 3 showed continued to have adequate model accuracy as ROC-AUC was .75 (p < .001) (Garson, 2016).

Finally, Model 4 considers all four groups of crime locations, MO characteristics, forensic awareness strategies, and the addition of victim characteristics. The classification accuracy improved again to 68.90%, meaning the total increase from the null to the final model was about 17%. Again, all variables remained significant from prior models, with the addition of two victim variables being significantly associated with the manner of body disposal. If the contact scene was deserted, the odds of the body being disposed naked decreased by 40% (OR = .60; p = .008). Crimes that included sexual penetration were about 2.5 times more likely to lead to a naked victim (OR = 2.47; p < .001), while the use of restraints and asphyxiation as the cause of death were both around 1.6 times more likely to result in a naked victim (OR = 1.64; p = .030 and OR = 1.67; p = .005, respectively). Dismemberment (OR = 2.85; p = .001), overkill (OR = 1.65; p = .027), and taking items from the scene/victim (OR = 1.71; p = .006) all increased the odds of finding the victim naked by 285%, 165% and 170%, respectively. SHOs who removed or destroyed evidence from the scene were about two times more likely to dispose of the body naked (OR = 2.01; p < .001), whereas those who administered drugs were about 6 times more likely (OR = 6.14; p = .020). Stranger victims were 42% less likely to be disposed of naked (OR = .58; p = .015). Conversely, victims who were

under the influence of drugs/alcohol were 1.64 times more likely to be naked when disposed of (OR = 1.64; p = .005).

The addition of MO characteristics saw the largest increase in classification accuracy with an improvement in approximately 9%, whereas all other models saw minor improvements. The overall regression model was significant and had a ROC-AUC value of .76 ($p < .001$), meaning the model performs relatively well at predicting naked disposal (Figure 2; Garson, 2016).

Table 5. Sequential Logistic Regression Predicitng a Naked Body Disposal.

Variables	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)
Crime Locations				
CS: deserted	.61 (.43, .85)**	.66 (.46, .97)*	.59 (.41, .87)**	.60 (.41, .87)**
CS: victim residence	.71 (.43, 1.18)	.65 (.37, 1.13)	.71 (.40, 1.25)	.74 (.41, 1.32)
OS: victim residence	.86 (.53, 1.40)	.85 (.50, 1.43)	.76 (.44, 1.31)	.69 (.39, 1.21)
Modus Operandi Characteristics				
Mutilate genitals		1.37 (.60, 3.15)	1.25 (.54, 2.91)	1.25 (.52, 3.02)
Sexual acts: penetration		2.58 (1.79, 3.72)***	2.51 (1.66, 3.52)***	2.47 (1.68, 3.63)***
Semen		1.16 (.79, 1.71)	1.19 (.80, 1.77)	1.17 (.78, 1.76)
Used restraints		1.59 (1.03, 2.45)*	1.66 (1.07, 2.58)*	1.64 (1.05, 2.57)*
Violence: asphyxiation		1.58 (1.13, 2.23)**	1.61 (1.13, 2.29)**	1.67 (1.17, 2.38)**
Dismemberment		3.19 (1.74, 5.85)***	3.04 (1.63, 5.67)***	2.85 (1.51, 5.39)**
Overkill		1.82 (1.20, 2.75)**	1.94 (1.26, 2.97)**	1.65 (1.06, 2.58)*
Items taken		1.87 (1.32, 2.64)***	1.46 (1.01, 2.11)*	1.71 (1.17, 2.52)**
Forensic Awareness Strategies				
Remove or destroy evidence			2.41 (1.63, 3.55)***	2.01 (1.40, 3.11)***
Precaution: administer drugs			5.41 (1.17, 25.03)*	6.14 (1.33, 28.41)*
Victim Characteristics				
Victim was a stranger				.58 (.40, .85)**
Victim under the influence				1.64 (1.10, 2.45)*
Victim had a thin build				1.11 (.78, 1.60)
Constant	1.47***	.35***	.30***	.33***
χ^2	17.71**	86.50***	31.72***	16.62**
Nagalkerke R^2	.04	.19	.25	.28
Overall % predicted	58.6	67.5	67.7	69.2

*p < .05. **p < .01. ***p < .001.

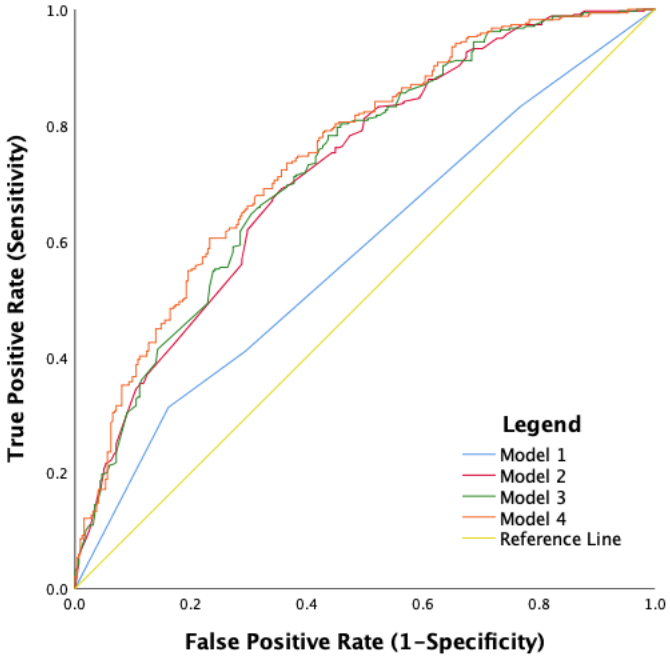

Figure 2. ROC-AUC for All Models with Naked Disposal.

Chapter 6. Discussion

The first study examined the predictive ability of factors related to a SHOs crime characteristics and victim selection on openly displaying the body. Of note, behaviours related to the offender's MO proved to be most important in determining the particular disposal method. Specifically, if a SHO exhibits the behaviours of inserting foreign objects into the victim, dismembering the victim, or engaging in post-mortem sexual activity with the victim, then the body is less likely to be displayed openly after the homicide.

Many of the MO behaviours do not coincide with the body disposal methods seen in typologies that put an emphasis on such acts, like the organized/disorganized dichotomy from Ressler and colleagues (1986), which echoes the conclusions of others in this field. Researchers have stated the importance of considering the entire criminal event and examining multiple criminal behaviours to achieve a more nuanced perspective of the decisions that go into the disposal method. For example, in their study on necrophilia, Chopin and Beauregard (2021a) concluded that post-mortem sexual activity was not indicative of any one type of SHO, and suggested the observation of additional crime scene behaviours in conjunction with necrophilic acts during an investigation. While a SHO may be predisposed to commit their crimes a particular way, as indicated by certain behavioural factors analyzed at the crime scene, situational factors before and after the homicide can limit the SHOs ability to act out their desired crime in its entirety (Beauregard & Field, 2008). Disorganized behaviours like foreign object insertion and post-mortem sex decreased the odds of open display, which is not in line with what Ressler and colleagues (1986) found in their research, as it is common for disorganized offenders to leave the body exposed or otherwise in a position that allowed for easy discovery. However, this result does not mean that a disorganized SHO did not intend to openly display the body. Instead, their decision could have been altered due to someone happening upon the scene, forcing them to flee in haste before they could dispose of the body the way they intended to – a way that is more in line with other disorganized crime scene behaviours (Bateman, & Salfati, 2007; Douglas & Munn, 1992). Many of the disorganized behaviours require a semblance of privacy for the offender to act them out (Hazelwood & Douglas, 1980). If the SHO was forced to abandon the victim without warning, they might leave them in a location or position that

resembles that need for privacy, which is likely not an openly displayed position. Therefore, it is necessary to further explore incidents that may have surrounded the crime, and especially those that occurred post-crime, that could influence how an offender disposes of the victim's body (Douglas & Munn, 1992). Also worth noting is that Canter et al. (2004) suggests that there are no discrete subsets of offense characteristics that can be distinctly divided into two categories. Organized features are common in most offenses, while disorganized features are rare and unique to the murders themselves. Additionally, due to the detailed manner in which the data were coded, it is possible that the body was openly displayed and other methods of body disposal were utilized as well, such as transporting the body to a more isolated area. The SHO might not see a need to further hide the body as they feel they are already in a safe location to carry out their fantasies and unusual acts, so they are comfortable leaving the victim openly displayed after the fact (Beauregard & Field, 2008; Reale & Beauregard, 2019). Future research should consider the intersecting act of transporting the body and how that may impact the final manner of body disposal.

These contradictory findings could also be explained by the heterogeneity of sexual homicide, and the differences reflected in every crime scene (Beauregard, 2019). The distinct behaviours are not only observed amongst different types of sexual offenders, but also more broadly at the international level when comparing SHOs of different countries. Beauregard (2019) examined the similarities and differences of crime scene characteristics observed in SHs between several countries and noted that hiding the body after the murder was one behaviour that saw greater variability than most amongst the seven countries that were compared. Not only do cultural and environmental influences account for discrepancies in study results – so does the size and make-up of the sample. Many empirical studies on sexual homicide have been conducted in the United States, and when looking at the difference in the number of SHOs included in these studies compared to those conducted in other countries, the existence of a substantial gap in sample size becomes obvious (Chan, 2017). The disorganized typology was created in the United States using an American sample of SHOs – many of which were also serial – while the current study uses Canadian and French data. Therefore, the heterogenous nature of sexual murder is further emphasized by contrasting samples of SHOs, which may account for the opposing finding that disorganized behaviours are less likely to indicate an openly displayed body in this sample (Beauregard, 2019; Chan, 2017).

Although overkill also falls under the umbrella of unusual and uncommon acts, it significantly predicted a greater likelihood of the body being openly displayed. This suggests overkill in itself may be used as a forensic awareness strategy, as certain acts may destroy or tamper with evidence left by the offender. Also, overkill could be so extreme that it prevents the identification of the victim, which can also delay the investigation. Beauregard and Martineau (2012) found in their study that acts of overkill were present in nearly half of their sample despite being relatively rare in sexual homicides. The authors argued that overkill could be used in further empirical tests of new and existing typologies because of its surprising prevalence in their study. Despite continued discourse surrounding what type of offender is most likely to display acts of overkill in their crimes (see Chopin & Beauregard, 2021b), investigators could look at overkill in particular as a useful behaviour that may be telling of how a body will be disposed of. One possible avenue to explore is the use of overkill by sadistic SHOs. Reale et al. (2020) noted that sadistic killers were more likely to be forensically aware as they spend more time with the victim and perform a variety of sadistic acts. Overkill could therefore be used not only as a forensic awareness strategy for the purpose of avoiding detection, but also as a means to fulfill the SHOs sadistic fantasies. Furthermore, the body being openly disposed of after the fact could be due to the SHO feeling confident that the overkill will delay the investigation and serves as a way to further humiliate the victim, which continues to satiate their sadistic desires (Chopin et al., 2020; Reale et al., 2020).

Only two variables related to victimology were significantly related to openly disposing of the body: victims who were under the influence of drugs or alcohol and victims who were hitchhiking. Victim characteristics can greatly influence an offender's decisions throughout their crime commission; for instance, victims who are under the influence of drugs and/or alcohol can be more appealing targets for SHOs as they are more disinhibited, making them more vulnerable to potential attacks and less likely to fight back (Beauregard & Proulx, 2007; Chan & Heide, 2009). In addition, their inebriated state may make them a more attractive victim to opportunistic offenders who see them as a way to quickly achieve immediate gratification. What they do after the crime is then not planned, much like the murder itself, and so the body is openly displayed with no attempt to hide it (Cale, 2018). Furthermore, SHOs who kill hitchhikers may not be concerned about hiding the body because investigators will already have difficulty identifying the contact and offense site due to selecting a victim in transit, meaning they

will likely take considerable time to find the body disposal site as well (Reale & Beauregard, 2019). Reale and Beauregard (2019) discussed how SH cases where the body recovery took more than 48 hours were seen when offenders went after victims who were travelling. Therefore, SHOs might feel confident that their victim selection will already delay the investigative process and thus will leave the body of a hitchhiker openly displayed. This, coupled with the open disposal of victims under the influence, posits that openly disposing of the body might be indicative of a forensically aware SHO, as they recognize that selecting a vulnerable victim may already lead to select challenges for law enforcement so they are comfortable to not engage in extensive measures to conceal the body post-crime (Beauregard & Bouchard, 2010).

The second study assessed the predictive ability of crime locations, modus operandi characteristics, forensic awareness strategies, and victimology variables in determining if the victim's body was found naked or clothed. Nakedness is a key determining factor when examining potential sexual homicide cases, yet existing literature has largely overlooked this particular method of disposal. These findings suggest that there are key crime scene behaviours associated with disposing of the body naked, and conversely, unique traits also associated with disposing of the body clothed.

Behaviours associated with an offender's MO were shown to have a large impact and be the most important when determining the state of the body. Worth noting, however, is that the particular variables that increased the likelihood of disposing of the body naked also happen to be characteristics strongly linked to sexual sadism. According to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 2022), sadism is defined as "recurrent and intense sexual arousal from the physical or psychological suffering of another person, as manifested by fantasies, urgers, or behaviours" (APA, 2022, F65.52). Sadistic SHOs derive sexual pleasure from the complete domination or control of another individual, typically through some means of torture, humiliation, or degrading acts (Berner et al., 2003; Chan & Heide, 2009; Grubin, 1994). This is clearly seen through such MO traits as sexual penetration, the use of restraints, death by asphyxiation, dismemberment, and overkill. The significance of particular variables and their association with a naked disposal is not surprising when examined through the lens of sexually sadistic behaviours. For instance, asphyxiation is the most common method of death used amongst sadistic SHOs (see Kim et al., 2023) so it follows that it is also associated with a naked disposal, as leaving

the body naked could be viewed as another way to further humiliate the victim (Chopin & Beauregard, 2022).

Taking items from the scene is also in line with sadistic offenders. Scales that have been developed to measure sadism have included items related to the souvenirs or trophies taken by sexual sadists as a reminder of the murder, which in turn allows them to derive additional sexual pleasure from the memory of the events after they've happened (e.g., Chan et al., 2013; Myers et al., 2019). Furthermore, sadistic sexual offenders are known to engage in forensic countermeasures and detection avoidance strategies (Beauregard & Martineau, 2012; Beauregard & Proulx, 2002; Reale et al., 2020). The behaviours highlight their criminal expertise and sophistication that is demonstrated throughout their entire crime-commission process. Accordingly, removing or destroying evidence as part of their forensic awareness strategies is also associated with the body being disposed of naked. In part with taking items from the scene, the removal of clothing could be intentional in that it eliminates DNA or other forensic evidence that implicates the offender in the murder. The crimes of sexual sadists are thoroughly planned and show the escalation in violent behaviours to fulfill their fantasies and the development of criminal expertise to evade capture (Reale et al., 2020). This promotes the idea that sadistic offenders in general are more likely to leave the body naked, either as a way to continue to engage in their sadistic sexual fantasies or as a means of forensic awareness; perhaps even both to some degree.

The typology that was developed in conjunction with the sadistic offender was the angry offender (Beauregard & Proulx, 2002), and the traits that are reminiscent of this SHO can also be seen in the study. Leaving the body clothed is in line with angry offenders, as it is common for these individuals to struggle with physically performing the sexual acts they want to, like penetration, because they suffer from such things as impotency or premature ejaculation (Beauregard & Proulx, 2002; Beauregard & Mieczkowski, 2012). This inhibits their ability to engage in penetrative sex so they kill the victim out of rage fueled by their embarrassment, and resort to a variety of other sexual acts to derive pleasure from the assault and murder that do not require the victim to be naked, like masturbating at the scene or fondling the victim. This may explain why some homicides are sexual in nature despite not conforming to one of the most salient indicators of sexual homicide. The viewpoint of undressing the victim as a forensic awareness strategy can also be used to distinguish sadistic versus angry offenders, as

angry SHOs often do not show investigative awareness or engage in behaviours to avoid detection (Beauregard & Proulx, 2002; Reale et al., 2020). It is typical of angry offenders to leave the body as is or otherwise put little effort into the disposal, so leaving the clothes on the victim is likely associated with these types of offenders as well. The lack of planning in the disposal is also seen in the victim selection, as stranger victims were more likely to be found clothed than naked. While sadistic offenders target stranger victims too, the opportunistic nature of the angry offender also suggests they will target strangers if the prime occasion arises. Despite previous work that has found stranger victims leads to a greater likelihood that the offender will force them to perform sexual acts before killing them, it has not been noted that this type of relationship increases the chances of being found naked (Beauregard & Mieczkowski, 2012; Beauregard & Proulx, 2002).

It is interesting to note that victim age and victim build were not significant at the bivariate and multivariate levels, respectively, considering their importance in related studies on body disposal. For example, Beauregard & Field (2008) found that children were more likely to be transported from the murder scene to a different disposal site. However, this study found that age and size of the victim did not influence nakedness, and instead other victim characteristics like stranger victims and level of intoxication were more important. This may suggest that despite the fair assumption that smaller and younger victims are easier to manipulate, undressing them might not be as necessary in the disposal as, say, transporting the body. Dumping them by taking the corpse away from the crime location could be viewed as more of a requirement due to the additional protection offered to the offenders by moving the victim (Beauregard & Field, 2008). With child victims there might also be some semblance of remorse or at the very least, less of a desire to humiliate them by leaving them naked; therefore, the offender alters the disposal scene as a reflection of that guilt (Russell et al., 2018). This is juxtaposed by victims who are under the influence of drugs and/or alcohol being more likely to be found naked. These individuals may be easier to manipulate and less likely to fight back in their inebriated state, making the offenders feel confident in their ability to undress them while they are still alive so they can engage in sexual acts (Beauregard & Proulx, 2007; Chan & Heide, 2009). In contrast, if the victim is still clothed once the homicide has been committed, the offender might display a lack of remorse and a complete disregard for the victim which is demonstrated by them leaving the now-dead victim naked. More victim

traits should be studied to determine which individuals and what behaviours might indicate a naked disposal.

This study is not without its limitations. The use of police data comes with the risk of biased reporting of case information. Data were used from an international database and much of it came from police reports and subsequent files related to criminal investigations. The use of police data means there is a chance of biased or skewed results. This can be due to the personal bias of the law enforcement personnel recording such info, as well as the innate bias around work on sexual crimes (Chopin & Aebi, 2019). Not only can this cause errors in recording, but it may result in a lack of information being collected altogether due to the enhanced dark figure of crime when there is a sexual component (Chopin & Aebi, 2019). In addition, obtaining accurate information on individuals from marginalized groups who become victims of sexual murder can be difficult due to their often transient lifestyles (Chan, 2021). An evaluation of how police collected information on these populations for the dataset might show that there is in fact missing data, and proper reporting and inputting of these cases could alter these findings. Additionally, with no universally operationalized definition of sexual homicide, cases that do indicate a homicide was sexual in nature may not be included or may have potentially been misclassified, leading to a sample in the dataset that is not representative of the total number of sexual homicides (Chopin & Aebi, 2019). In addition, the dark figure of crime is a common concern when using data derived from police reports. However, while much of the previous work on sexual homicide has suffered from poor sample size, it can safely be said that this was not a limitation of this study. Therefore, findings could be applied to cases outside of France and Canada, with criminal justice personnel in various regions potentially being able to refine their investigative strategies to include this information on openly displayed bodies. While the dataset provided an extensive amount of descriptive information about the victims and crime scene, it lacked adequate information about the offender themselves that could have provided additional useful information related to their body disposal decisions, and future research should try to include more offender characteristics when testing particular body disposal methods.

Finally, an important number of independent variables were tested which can lead to Type-1 error. Although using a Bonferroni correction is one way to avoid this type of error, this study is exploratory in nature and is not meant to test specific hypotheses.

A Bonferroni correction is a very conservative procedure that is criticized for increasing the risk of Type-2 errors (see e.g., Napierala, 2012; Streiner & Norman, 2011), especially in the context of exploratory studies.

Chapter 7.

Conclusions

Overall, the present study confirms that crime scene and victim characteristics are related to how an offender disposes of the victim's body; though, depending on the particular method of disposal, the relationship was not entirely what was expected. In the first study, many of the behaviours predicted that the body was less likely to be openly disposed of if they were present at the crime scene. Findings show that most MO variables present during the crime and victim variables associated with higher risk are predictive of an openly displayed body, whereas the crime locations and forensic awareness strategies are not. This implies that some SHOs who engaged in the extremely personal and humiliating acts of foreign object insertion, post-mortem sex, and dismemberment have more time after the crime to hide or otherwise conceal the body to perform the acts without being interrupted or caught. In contrast, overkill being predictive of openly displaying the body may serve the dual purpose of being a forensic awareness strategy that aids in detection avoidance while allowing the SHO to express their sadistic fantasies by further humiliating the victim through open disposal (Chopin et al., 2020; Reale et al., 2020). The influence of situational factors should be noted as they may provide appropriate nuance to these results in terms of why they appear to not be in line with the past findings, such as what is seen in the original organized-disorganized dichotomy (Beauregard & Field, 2008; Ressler et al., 1986). For instance, post-mortem sex might be spontaneous and more indicative of a disorganized offender, but to take the time they want with the victim, they might be more willing to make the effort to move the body from a busier area to a more secluded place where there is less risk of being happened upon. Or, if they are interrupted while with the victim's body, the SHO might flee to avoid being caught and thus leave the body in plain sight (Bateman, & Salfati, 2007).

Certain victim traits also were more indicative of the body disposal method, as victims who are hitchhikers or under the influence were more likely to be openly displayed. Intoxicated victims might be appealing to opportunistic offenders because of their reduced ability to gauge their own safety or fight back against the SHO, whereas targeting hitchhikers makes it difficult for police to pinpoint important crime locations and

narrow down suspects (Chan & Heide, 2009; Reale & Beauregard, 2019). Thus, open disposal could be due to a lack of planning based on the opportunistic nature of the crime or because victims in transit already complicate investigations, respectively (Cale, 2018; Reale & Beauregard, 2019).

Furthermore, the present study determines that MO characteristics that are in line with sexually sadistic offenders, like vaginal and anal penetration, asphyxiation as the cause of death, dismemberment, and overkill, are seen when a body is disposed of naked. Angry offenders often dispose of their victims clothed due to a lack of planning and criminal expertise, and this was also reflected in the results of the study.

Many law enforcement agencies and investigators have already been following the Ressler et al. (1992) definition of sexual homicide when examining murder scenes, and many also use the first criteria of nakedness as the most telling indicator of the homicide having a sexual component. Based on the present findings, the victim being naked can suggest that a sadistic offender was behind the murder as several variables associated with sadism were highly predictive of the victim being undressed. Therefore, when police encounter such scenes, they can tailor their investigations to ensure that they are considering suspects who present with sadistic tendencies and behaviours. In contrast, homicides where the body was found clothed should not automatically result in the assumption that the murder was not sexual. Instead, investigators should consider that an angry offender may be behind the crime and consider these characteristics when trying to identify the perpetrator. Sexual sadism has also been identified as a sub-group in the *organized* offender from the dichotomy created by Ressler et al. (1986). Several other typologies of sexual homicide have identified specific sadistic elements that help distinguish distinct offender types, many of which include the elements of torture, humiliation, and therefore, disposing of the body naked (e.g., Beauregard & Proulx, 2002; Chan & Heide, 2009). The findings in this study offer further empirical validation that these elements are strongly associated with sadistic offenders, providing additional confirmation that investigating these sadistic types when looking at sexual murders with these traits is good practice.

This study begins to establish that crime scene and victim traits can be predictive of a certain body disposal method, not just movement of the body post-crime. Future studies should build upon the foundation set by the current study by exploring additional disposal methods for a more well-rounded and nuanced perspective on this post-crime

behaviour. While openly displaying the body and disposing of the body naked are common disposal methods of SHOs, they are certainly not the only ones, and so examining how traits related to their MO influence them to select one method of body disposal over another, such as partially hidden versus submerged underwater, is an important avenue to explore in future studies (Morton et al., 2014). Additionally, an examination of the intersection between the manner of disposal and the associated movement patterns is necessary, as these have typically been studied separately despite the knowledge that many offenders will transport the body as part of the disposal (Beauregard & Field, 2008; Morton et al., 2014).

Further, the inclusion of situational factors might assist in developing a more thorough understanding of the offender's decisions during the crime and their subsequent decisions around body disposal (Beauregard & Field, 2008; Reale et al., 2020). Furthermore, sexual sadism is known to escalate and progress, with the severity of the sadistic acts becoming more extreme as the offender learns what they find pleasurable during the murder (Chan & Heide, 2009; Geberth, 2010). The sadistic offender might not have the desire to leave the victim naked as part of their fantasy to start, but include it later on as they evolve. One important facet of sadism is the sexual pleasure derived from humiliating the victim and taking control away from them (Berner et al., 2003). Leaving them naked is one way to achieve this, and as the offender develops their criminal repertoire and engages in additional pleasurable acts, they might begin to also leave the body naked as a way to further humiliate the victim. An exploration of how environmental and situational factors influence the body disposal of sadistic offenders, particularly around their decisions to leave the body naked or not, is required to further the understanding of how victim's come to be naked in sexual homicide.

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