

A LITERATURE REVIEW OF EMPIRICAL PAPERS
ON BEHAVIORAL INTERVENTIONS FOR
INAPPROPRIATE MASTURBATION

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by
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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

A LITERATURE REVIEW OF EMPIRICAL PAPERS ON BEHAVIORAL
INTERVENTIONS FOR INAPPROPRIATE MASTURBATION

presented by Danessa Clay,

a candidate for the degree of Master of Applied behavior analysis,

and hereby certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

My work is entirely dedicated to the enthusiastic underdogs, the “good for nothings,” the persistent, yet tired students. My devoted loved ones, whose unwavering support made this thesis paper, and much more, feasible. Furthermore, this is to every lesson and every entity, in my life that has provided me with an opportunity to grow. To those who never denied me love when I denied myself. This is to those who always inspire and uplift me, in their own unique way. Therefore, I *must* specifically express my gratitude for,

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My Twin
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Books-*Especially Big*
Page. 333
Tupins, The Crow
Nature
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Immunosuppressives
Antihistamines
Dr. P.
(Li₃C₆H₅O₇)
Dr. Bob
Focus Points with The Fox
Everyone who Ever Counted Me Out
Green Tea
Turmeric & Black Pepper
Friends of Bill
Miracles!

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On Terms

In DSM-5, intellectual disability (ID) is considered to be approximately two standard deviations or more below the population, which equals an IQ score of about 70 or below. In 2022, the DSM updated criteria (DSM-TR) and now ID will be diagnosed by “the assessment of intelligence across three domains (conceptual, social, and practical). The disorder characteristics per the DSM-TR are, “Intellectual disability involves impairments of general mental abilities that impact adaptive functioning in three domains, or areas” (American Psychiatric Association, 2022, p.37). The terminology used has changed significantly: Intellectual disability (intellectual developmental disorder) as a DSM-5 diagnostic term replaces “mental retardation” used in previous editions of the manuals. Other historical, obsolete, stigmatizing terminology include idiocy, feeble-mindedness, mental deficiency, mental disability, mental handicap, and mental sub-normality Schalock et al., (as cited in Stein, 2022). While none of these terms are acceptable federally in practice today and are considered derogatory (Rosa’s Law, 2010), some of these terms arise within this thesis when direct quotes or references to literature are used. Because this thesis includes literature published during the time the outdated terminology was used, terms are reflective of the original sources.

Stein, S. (2022) Sexuality and people with intellectual and developmental disabilities: a behaviour analytic exploration of issues. [Doctoral Thesis, Queens University Belfast]. <https://pure.qub.ac.uk/en/studentTheses/sexuality-and-people-with-intellectual-and-developmental-disabili>

A LITERATURE REVIEW OF EMPIRICAL PAPERS ON BEHAVIORAL
INTERVENTIONS FOR INAPPROPRIATE SEXUAL BEHAVIOR

Danessa Clay

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ABSTRACT

Individuals with intellectual and developmental disabilities (IDD) have historically been denied the right to express their sexuality or engage in sexual relationships due to misconceptions or negative attitudes. During the past four decades, parents and professionals have begun to collaborate to find ways to support loved ones and other individuals with Intellectual or Developmental Disabilities (IDD) in understanding their sexuality and safe engagement in appropriate self-affirming sexual behaviors. One common habitual challenge some individuals with IDD, autism spectrum disorder (ASD), and other neurological disabilities face is engagement in inappropriate sexual behavior (ISB). The purpose of the current literature review was to describe the empirical literature on behavior interventions for inappropriate masturbation, from several variables of interest, including design type, participants, independent variable (IV), dependent variable (DV), was the function of behavior determined prior to intervention, type of intervention, was a reinforcement-based intervention used before a punishment-based procedure was implemented, was maintenance/follow up completed and if so for how long, and, finally, was generalization programmed. Articles reviewed only involved individuals with IDD or ASD.

Brief Introduction & Literature Review

Sexuality refers most broadly to the quality of being sexual. It encompasses biological, erotic, emotional and social feelings as well as social behaviors, and the manner in which people make sense of these (Braathen et al., 2021). Until the 1960s, the sexuality of people with disabilities was handled by denial and suppression. Individuals with developmental disabilities have historically been denied the right to express their sexuality or engage in sexual relationships due to misconceptions or negative attitudes. Not only have individuals with developmental disabilities been viewed as sexually deviant, but they have also been seen as irrelevant, prone to criminality, asexual, and problematic to society (Richards et al., 2006).

Brief History of Sex Education, Understanding and IDD

The eugenics movement of 1880–1940 led to forced mass sterilization and the segregation of these members from society (Kempton & Kahn, 1991). The civil rights movement and the "sexual revolution" were among the catalysts for change, as were the moves toward normalization and deinstitutionalization of people with disabilities, more specifically, those with intellectual and developmental disabilities (IDD; Kempton & Kahn, 1991). This normalization movement prevailed well into the 1980s. It created an atmosphere for families, caregivers, educators, and professional healthcare workers to critically examine their personal and professional attitudes toward the sexuality of their clients and children with developmental disabilities (Kempton & Kahn, 1991). During the past 4 decades, parents and professionals have begun to collaborate to find ways to support loved ones and other individuals with IDD in understanding their sexuality and safe engagement in appropriate self-affirming sexual behaviors (Kempton & Kahn, 1991; Pendler & Hingsburger, 1991).

It is frequent for people in society, including health professionals, to hold many views about the sexual lives of others (Braathen et al., 2021). There are many ideas about what sorts of ‘sexual beings’ other people are, what type of relationships they should have, and with whom they should have them (Braathen et al., 2021). The literature and anecdotal reports suggest people without disabilities hold false assumptions about the sex lives of those with disabilities (Braathen et al., 2021). For example, the assumption that someone using an assistive device such as a wheelchair is asexual¹ occurs when people who do not have disabilities think that those who use a wheelchair are incapable of having sex. This is known as the "myth of asexuality" in disability studies (Milligan & Neufeldt, 2001) and seems to be a common assumption people without disabilities have about people with disabilities (Braathen et al., 2021). As mentioned above, a major social barrier for people with physical disabilities to live full sexual lives is the belief that people with disabilities (such as physical disabilities) are asexual (even if they do not identify as such) and are thus not perceived as sexual people. Asexuality is a valid sexual identity, but like any other, it should not be imposed on people from the outside (Braathen et al., 2021).

During childhood and adolescence, those without a disability typically learn about sex and sexuality. Sexual health and hygiene are typically taught at school. Some may have been taught about sex by their parents or given a book to read about it (Braathen et al., 2021). People also learn about sex and sexuality, both positive and negative aspects, on the internet today. For the most part, society understands that educating adolescents about sex, relationships, and sexual health is not only necessary but imperative. However, regarding children and adolescents with

¹ Asexuality: Also referred to as “ace,” asexuality is an umbrella term for anyone who experiences little to no sexual attraction toward other people of any gender.

disabilities, people's views tend to differ (Braathen et al.,2021). A considerable amount of research from all over the world has persistently shown that young people with disabilities receive less sexual health education than their peers without disabilities (Braathen et al., 2021).

There are assorted reasons for this. Literature and research have shown that in countries throughout the world people with disabilities receive less education overall than the general population. The World Health Organization (WHO) and The World Bank (2011) stated children with disabilities are less likely to start school, have lower rates of staying in school, and lower rates of being promoted in school. Additionally, while poorly delivering sex education to youth with disabilities increases risk and deprives young people the education of knowledge about safe sexual practices and sexual and reproductive health, it also limits opportunities for the development of sexual self-esteem (Braathen et al., 2021). Sex education is also important in terms of providing young people with an understanding of their own bodies and giving them the knowledge and skills needed to make their own informed choices about sex and relationships, what the social norms are about sexuality and relationships, and how to recognize abusive or exploitative sexual behaviors.

Due to the lack of sexual education for individuals with disabilities, this population is more at risk of victimization as well as violence perpetration. For autistic adults, limited sexual knowledge has been associated with increased sexual violence risk, whereas socio-communicative and emotional deficits are not identified risk factors for poly victimization (Dike et al., 2022; Weiss & Fardella., 2018). Research has repeatedly demonstrated that people with disabilities are at significantly greater risk of experiencing violence compared to their non-disabled counterparts (Gibbs et al., 2021). Latvala et al. (2022), noted that challenging behavior is commonly observed in ID service settings, and while deinstitutionalization from the 1970s

onwards resulted in individuals with ID successfully participating in the community, it also led to increased contacts with the criminal justice system due to cognitive and social vulnerabilities.

According to Thurm et al., (2019), historically there have been blurred diagnostic boundaries between the diagnosis of ID and ASD. Historically, the sexual behaviors and desires—even those expressed appropriately—of people with intellectual disability (PWID) have been ignored, prevented, or punished by those in charge of their care (Black & Kammes 2021). Although sexual education and behavior is an under-researched issue for individuals diagnosed with IDD and autism spectrum disorder (ASD), it is common for individuals diagnosed with IDD or ASD to engage in socially stigmatized behaviors that may hinder learning and potentially harm their health (Calabrò et al., 2012). A habitual challenge some individuals with IDD, ASD, and other neurological disabilities often face is engagement in inappropriate sexual behavior (ISB). Per Tarren-Sweeney (2008), sexual behavior that is developmentally and socially inappropriate or potentially harmful or distressing to others is an example of inappropriate sexual behavior. These behaviors may include nonconsensual sexual contact, masturbation in public, taking off clothing in public, looking down on others' shirts or up skirts, sexual behavior with inappropriate objects, and sexually explicit talk (Tarren-Sweeney, 2008).

Applied Behavior Analysis and Inappropriate Sexual Behavior

Approximately 55 years ago, Baer et al. (1968) described the discipline of applied behavior analysis (ABA). This discipline was distinguished from the experimental analysis of behavior by its focus on social impact (i.e., solving socially important problems in socially important settings). Slocum et al. (2014) states that ABA has produced remarkably powerful interventions in fields such as education, developmental disabilities and autism, clinical

psychology, behavioral medicine, organizational behavior management, and a host of other fields and populations.

There is evidence that ABA, the science in which tactics derived from the principles of behavior are applied to improve socially significant behavior, and experimentation is used to identify the variables responsible for the improvement in behavior (Cooper, Heron, & Heward, 2019), is effective; it aims to teach the individual a new behavior that replaces the original inappropriate behavior (Phillips et al., 2017). Rather than suppressing sexual desires, practitioners should strive for appropriate sexual expression (Beddows & Brooks, 2016). As noted by Alberto and Troutman (2003), all behavior serves a purpose. It is important to know why an individual is engaging in a behavior that is problematic and to know how to respond to the behavior. Assessing the function of behavior helps practitioners learn what the individual is “getting from” engaging in that behavior. The goal is to teach the individual a more appropriate alternative behavior instead. The predominant four functions of behavior are attention, escape, access, and sensory needs. These four functions allow us to understand and categorize someone's actions, as well as determine why behaviors occur (Cooper et al., 2019). According to the current Behavior Analyst Certification Board Ethics code in sections *2.01 Providing Effective Treatment* and *2.14 Selecting, Designing, and Implementing Behavior-Change Interventions*, as well as others, each of these areas highlight the attribute of being supported by scientific evidence. Therefore, it is important to know what has been done in the field of ABA, specifically regarding certain behaviors and what is backed by science, how the field has evolved and developed throughout the last few decades, and where the field is going, and what is important to know for current and future individuals that may need behavioral services.

According to Hartini et al., (2021, p. 168), the results of their review, which was to “*synthesize studies on the problems regarding sexual behavior in adolescents with ID to obtain data on the types of risky sexual behavior problems*” indicated that masturbation is the most common type of solitary sexual behavior in children with IDD and ASD. Walsh, (2000) noted that masturbation functions as a primary sexual expression for many people with intellectual disabilities. However, masturbating, while appropriate in private settings, is considered highly inappropriate or even illegal in public places (Cierco, 2019) such as outdoor locations or school settings (Armstrong & Drabman, 1998; Patterson & Scott, 2013). A further concern is ineffective masturbation, which can lead to individuals engaging in masturbation for excessive durations without orgasm and utilizing methods that can be dangerous, both in specific form (Hellman’s et al., 2010) or through excessive duration resulting in genital injury (Calabro et al., 2012; Kul et al., 2014; Robison et al., 1992). Furthermore, inappropriate masturbation may lead to disruptions of daily activities, leading to aversive levels of stress for the individual or those around them (Dufrene et al., 2005; Ruble & Dalrymple 1993; Hellemans et al., 2010)). Inappropriate masturbation can have the detrimental impact of delays in development when it comes to social skills and learning ability (Cierco, 2019) and is not safe or socially acceptable behavior.

In addition to being harmful, inappropriate masturbation is a very sensitive issue which many people find embarrassing to discuss or address. Inappropriate masturbation is defined as the “self-stimulation of the genitals using hand or rubbing genital against any surface that occurs in an inappropriate place or at an incorrect time or is conducted with a level of force that injures the genitals, or when masturbation interferes with regular activities due to its frequency, or when masturbation is engaged in almost constantly, or when the form of

masturbation is causing distress in the individual or distress in others (Hingsburger, 1994, p. 279)". Addressing the topic is integral. Walsh (2000) found that

"Over half of the referrals in 1994–1997 to Family Planning Queensland's one-to-one education program for people with intellectual disabilities were for people displaying inappropriate sexual behavior. Of those, about 70% were referred because of a topography of inappropriate masturbation, such as masturbating in public places, masturbating for long periods, masturbating to the point of self-injury, stealing others' underwear to masturbate with, or becoming frustrated or violent after masturbating due to ineffective masturbation" (Walsh, 2000, p. 28).

In summary, individuals who have IDD or ASD may engage in socially inappropriate masturbation that puts themselves or others at risk for harm. Therefore, more research and intervention that produces behavior change is needed.

Purpose

The purpose of the current literature review was to describe the empirical literature on behavior interventions for inappropriate masturbation, a form of behavior that is under the umbrella term "Inappropriate sexual behavior". This article review described the literature from several variables of interests, including design type, participants, independent variable (IV), dependent variable (DV), was the function of behavior determined prior to intervention, type of intervention, was a reinforcement-based intervention used before a punishment-based procedure was implemented, was an alternative behavior taught, was maintenance/follow up completed and if so for how long, and, finally, was generalization programmed. Articles reviewed only involved individuals with IDD or ASD.

Methods

Search Terms

The main keywords of the main search terminology were developmental disability, disrobing, inappropriate sexual behavior, masturbation, and behavior analysis. These were followed by additional search terms that were paired or grouped with the main keywords. Those search terms are sexuality, sex, disability, behavior, functional analysis, sexual behavior, and interventions. The final combination of search terms as they were grouped are:

1. Inappropriate sexual behavior, Masturbation, and Behavior Analysis
2. Inappropriate sexual behavior, Masturbation, and Behavioral Interventions
3. Developmental disability, Inappropriate sexual behavior, and Behavior Analysis
4. Developmental disability, Disrobing, Inappropriate sexual behavior, and Behavior Analysis

Search Methodology

The literature search consisted of five steps. Figure 1 summarizes the search process used in this literature review. The first step involved asking experts in the field of sexuality, behavior, and intellectual disabilities whether they were aware of any relevant studies for this review.

Second, Google Scholar, Educational Resources Information Clearing House (ERIC), and ScienceDirect were the databases searched. An ancestry search of the references in the included articles was also completed to identify additional articles. Duplicate records and records that were not empirical were removed before screening.

Step three was a screening of records for relevance for this review, records were excluded if they did not focus on inappropriate sexual behavior. The articles found via search terms were

organized into a spreadsheet file using a total of sixty-three rows and thirteen columns to help arrange, calculate, and sort through the literature data. The columns were organized by headings, “Article #,” “Title of Article/Citation” “Author(s)” “Year” “Journal” “Type: Empirical/Nonempirical” “Research Question” “Design Type” “Participants” “Independent Variable (IV)” “Dependent Variable (DV),” “Reviewer (Brief) Interpretation/Comments,” “Was a Functional Analysis completed/Function of BX determined,” “Maintenance Phase (Yes/No) Duration,” “Generalization,” “Reinforcement Used (type),” “Punishment Used (type).” Specifically, regarding reinforcement and punishment, was reinforcement used before punishment.

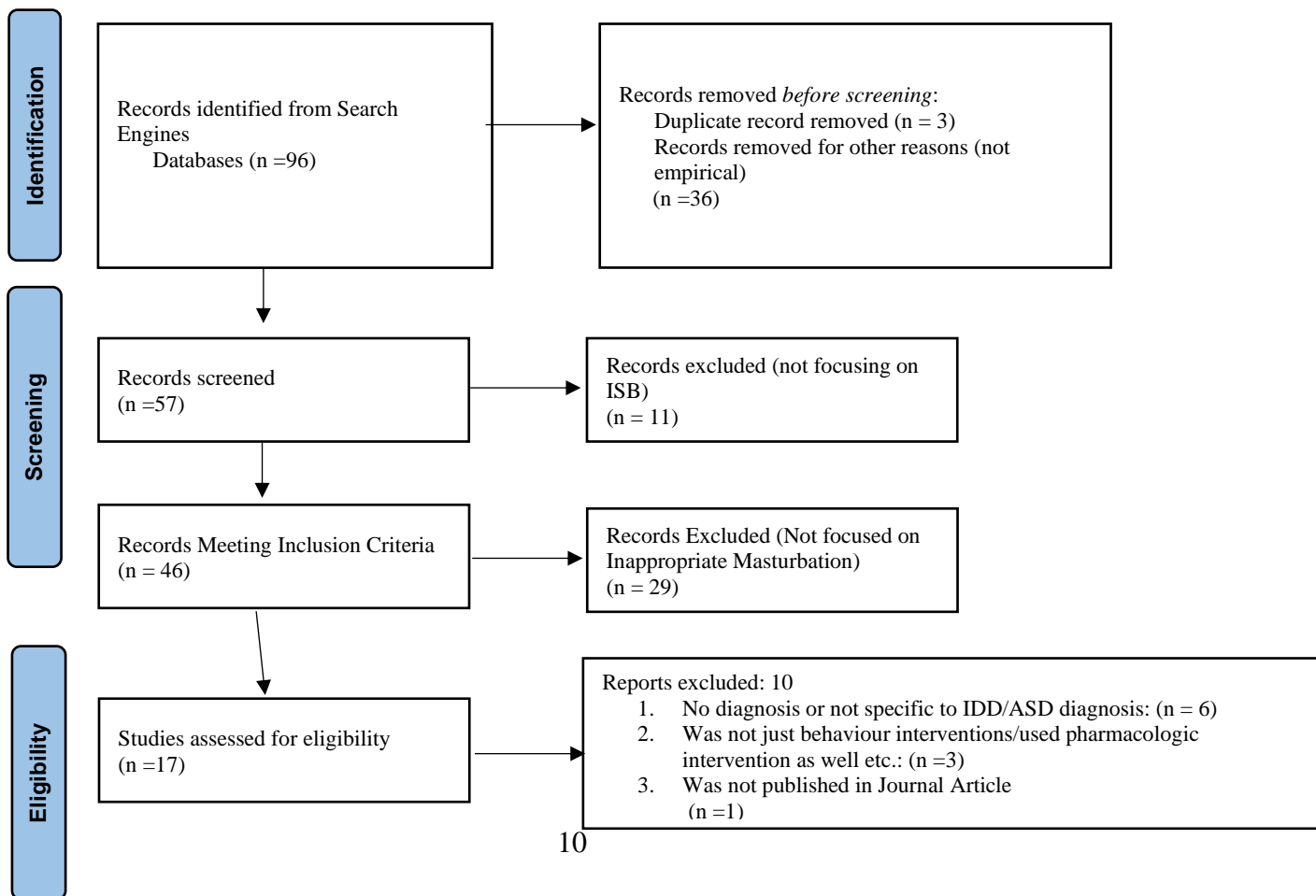
In step four, identified articles from step three were screened. Articles were excluded for not focusing specifically on inappropriate masturbation. Lastly, step five articles were analyzed for eligibility for inclusion in this review. Reports were excluded for: no diagnosis or not specific to IDD/ASD diagnosis, not solely behavior interventions/used pharmacologic interventions, or not published in peer-reviewed journal articles.

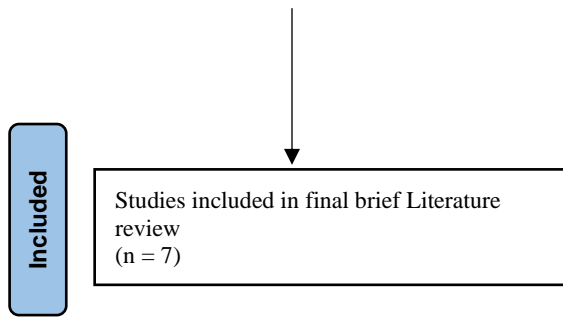
Inclusion Criteria

To be included in this review, a study must have evaluated the effects of a behavioral intervention that was intended to address inappropriate masturbation. Additionally, to be included the interventions had to be paired with at least one participant of any age with a diagnosis of IDD and or historical labels, or ASD. An intervention was deemed behavioral if it implemented treatments that utilized operant or respondent conditioning. To meet considerations for inclusion, the article must have also been in English and fit into the category of single-case research design. Given the limited amount of current research in this area, articles were included regardless of the year of publication.

Following the literature search, articles and abstracts were reviewed to evaluate which studies met all of the following criteria: (a) the study was a published journal article; (b) it was empirical (i.e., data-based in terms of the description of behavior and intervention; no mere description of sexual knowledge or attitudes); (c) it included only behavioral treatments (i.e., excluded pharmacological, etc.); (d) it was not a literature review; (e) ISB as a target behavior was defined or described as inappropriate masturbation regardless of the location of occurrence and was at least one of the study’s dependent variables; (f) it used a single-subject design; (g) a diagnosis was described; (h) participants were diagnosed with ASD or IDD or historically labeled as “mental retardation or profound mental retardation or some other variant of label”;(i) no age or gender criteria were applied; and (j) was published in English. This resulted in the inclusion of seven (7) studies.

Figure 1. PRISMA Flow Diagram 2020





From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372: n71. doi: 10.1136/bmj. n71

Variables of Interest and Scoring

This review describes the identified empirical papers along dimensions including design type, participants, independent variable (IV), dependent variable (DV), and whether the function of behavior determined prior to intervention and regarding the type of intervention, e.g., was a reinforcement-based intervention used before a punishment-based procedure was implemented. Additional dimensions reviewed included whether follow-up maintenance phases were conducted, and if so, what was the duration after treatment that a maintenance phase was completed, and whether generalization occurred and across what domains (e.g., was generalization achieved across either settings, people, or time).

One salient point is the pre-treatment determination of the function of the behavior of concern is vital in the field of behavior analysis. Although there are various functional behavior assessments (FBA) as well as the Functional Analysis Screening Tool (FAST) that can be used to identify why a behavior occurs, these resources should not always be used as a replacement for the Functional Analysis (FA) as the FA has been described as the *gold standard* method for understanding the environmental variables that come to shape and maintain problematic behaviors such as aggression, self-injury, and property destruction (Saini et al., 2020). FA

methodology focuses on the identification of variables that influence the occurrence of problem behavior and “has become a hallmark of contemporary approaches to behavioral assessment” (Hanley et al., 2003, p. 147).

In addition, reviewing interventions to identify them as reinforcement-based or punishment-based procedures is important to the field of ABA and the future of its impact in the specific area of Sexual Behavior Analysis as a whole because positive reinforcement is the most important and most widely applied principle of behavior analysis according to Cooper, Heron, and Heward (2007). ABA recognizes that punishment should only be used as a last-resort effort when all positive reinforcement has been exhausted (BACB ethics code for Behavior Analysts, **Section 2.15, 2022**)

“Minimizing Risk of Behavior-Change Interventions Behavior analysts select, design, and implement behavior-change interventions (including the selection and use of consequences) with a focus on minimizing risk of harm to the client and stakeholders. They recommend and implement restrictive or punishment-based procedures only after demonstrating that desired results have not been obtained using less intrusive means, or when it is determined by an existing intervention team that the risk of harm to the client outweighs the risk associated with the behavior-change intervention. When recommending and implementing restrictive or punishment-based procedures, behavior analysts comply with any required review processes (e.g., a human rights review committee). Behavior analysts must continually evaluate and document the effectiveness of restrictive or punishment-based procedures and modify or discontinue the behavior-change intervention in a timely manner if it is ineffective.”

It is paramount to describe the procedures and review the literature and interventions used for any ISB, however, this review will focus solely on inappropriate masturbation.

To score the identified components of the articles included in this review, operational definitions were created. The components of alternative behavior, reinforcement prior to a punishment procedure, maintenance and generalization were scored using a dichotomous scale (yes/no). **Alternative behavior** was defined as a report of an alternative and/or replacement behavior(s) being taught during an intervention. **Reinforcement before punishment** was defined as report of prior intervention using a reinforcement-based procedure and it not being successful before choosing a punishment-based intervention. **Maintenance/Follow-Up** was defined as report of a maintenance or follow-up phrase any length after the intervention is conducted. (Maintenance/follow up is the ability to retain a previously acquired skill and perform it or maintain a reduction in specified behavior once the behavior procedures have been removed.) **Generalization** was defined as a report of generalization during or after the intervention and generalization can happen across 1) settings, 2) time, and 3) people and exists when the behavior occurs in these various dimensions without relearning. **Determining if the function of behavior was identified** prior to intervention was scored using a 3-point rating scale of 0-2. An article received a score of 0 if the study did not report the function of behavior. An article received a score of 1 if the study reported function of behavior but reported no details on how the function was determined. Lastly, an article received a score of 2 if the study reported the function of behavior and named specifically what they did to determine function. Due to the small number of studies, comparison was not feasible, therefore results were only descriptive.

In addition, the types of interventions were described into the major categories of antecedent, other, reinforcement, punishment, and combination (e.g., reinforcement and

punishment). To further review the maintenance and generalization phases of each study, maintenance review included how long maintenance was measured and how many studies of each maintenance duration (e.g., one week to one month after the completion of the intervention phase or six to 13 months after intervention) were there. Lastly, generalization data was reported for how many domains of generalization across occurred for each study (e.g., across settings, across people, across time). Table 1 summarizes the articles included in this literature review.

Article	Design	Purpose/Research Aim	Participants #, Age, Gender, Diagnosis Location/Setting	DV frequency, Level	Function Determined	Intervention/IV Form, Alt. Beh. Reinforcement (R) Before Punishment (P)	Maintenance/Follow Up Generalization
Barmann & Murray (1981).	Multiple baseline across 3 settings, class, bus and home	Analyze effectiveness of facial screening reducing ISB in a male	1, 14 years Male Severally retard non-ambulatory Classroom, School Bus, Home	Frequency	No	Facial Screening (Other)-Sex education was involved No Alt. Beh. Yes reinforcement before Punishment	Maintenance for-6 months Generalization across setting, time & people
Cividini-Motta et al., (2020).	reversal and alternating treatments	Investigated the effects of RIRD and RI on PM of children and adolescents with autism.	4; 2,13-year-old males; 1, 20 year old male: 1, 6 year old Female ASD Public/School	Frequency	Yes	RIRD and RI No Alt. Beh No reinforcement before Punishment	No maintenance Generalization across and within participants
Cook et al. (1978).	multiple baseline across 2 settings, class and home	eliminate public masturbation with contingent lemon juice	1, 7.8 years Male Mental Retardation School and Home	Occurrence	Yes (See note)	Lemon juice No Alt. Beh No reinforcement before Punishment	Maintenance for 6 months Generalization across setting, time & people
Foxx et al. (1986).	multiple baseline across morning and afternoon classes	evaluated the effects of access to opportunities to earn edibles for performing a high probability stereotypic behavior on public genital stimulation and stereotypy.	1,16 years old Male Mental Retardation Classroom	Frequency	No	DRO and Edibles Yes Alt. Beh Yes, reinforcement before Punishment	Maintenance for 1 month Generalization across time
Kaesler, & O'Neill, (1987).	single subject	This report presents task analyzed masturbation instruction.	1, 29 years Male Profoundly retarded Home	Frequency & Level of Response	No	Task Analysis (TA) instructions: The preferred method of masturbation was broken down into six steps (Other)- Task Analysis Yes Alt. Beh N/A	No maintenance Generalization across time
Luiselli et al., (1977).	Single Case AB Design	case study in which positive practice overcorrection was utilized to treat the persistent masturbation of a child	1, 8 years Male, Mentally Retarded/psychotic and "autistic-like" Public	Frequency	No	Token Economy and Overcorrection Reinforcement-Token Economy Punishment-Overcorrection Notes: combination Yes Alt. Beh Yes reinforcement before punishment	Maintenance for 12 months Generalization across time

Withers, & Gaskell, (1998).	single subject	aimed to implement a minimally aversive behavioral intervention to address the inappropriate masturbatory behavior of a child	1, 11 years Male Mild Learning Disabilities Private & Public (at home and at school)	Frequency	No	Four principal components of Self Controlling/Management (Other)-Self-Controlling Techniques Yes Alt. Beh Yes, reinforcement before punishment	Maintenance for 1 month and 12 months Generalization across time
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Table 1. Included Articles Summary Table

Reliability.

Interobserver agreement (IOA) was completed for inclusion or exclusion for 30% of all empirical articles, as well as for the scoring of variables of interest for the articles selected for inclusion in the review. IOA was calculated by computing the percentage (%) of agreements, of IOA data collection in which both observers were in exact agreement as in both observers recorded the *same* data, dividing it by the total number of comparisons, and multiplying by 100 to determine the percentage of IOA. Exact agreement % = (# of exact agreement / # of total possible agreements x 100). IOA for Inclusion and Exclusion average % agreement was 94% with a range of 80-100%. IOA for scoring all other articles across all variable interests scored 100% agreement. The average of the calculated percentages for IOA was calculated by adding the percentages and dividing by the total count of percentages, then multiplying the sum by 100. The average of all percentages was 91.33% with a range of 80-100%. The average of all percentages within the scoring of variables of interest was 90% with a range of 80-100%. The aim was to achieve at least 80% agreement between the two raters. When disagreement occurred, the two raters reviewed the operational definitions and resolved any discrepancies.

Results

Overall Results

While performing this literature search there were 93 papers identified, 57 of the 93 were empirical, 46 of those 57 discussed interventions for inappropriate masturbation and 17 of those 46 addressed behavioral interventions for ISB with the topography described as inappropriate

masturbation. A total of 7 out of the 17 met the full inclusion criteria to be included in this review. The seven articles included in this review are listed in Table 1 and summarized below.

Barmann and Murray (1981) tested the effectiveness of facial screening in reducing inappropriate masturbation in a male and also used an intrusive procedure to decrease genital stimulation. The participant was a 14-year-old male diagnosed with a severe level of ID. The procedure involved the therapist placing an opaque cloth or screen in front of the participant's eyes contingent on inappropriate masturbation. The researchers saw decreases in inappropriate masturbation across three environments and low to zero levels at follow-up.

Cividini-Motta et al. (2020) compared Response Interrupting (RI) and Response Interruption and Redirection (RIRD) in an alternating format to determine and compare the effectiveness of both procedures on the reduction of public masturbation (PM). In the RI condition, each time the participant engaged in PM, the therapist made a brief verbal comment (e.g., "stop doing that"), and used physical guidance to briefly interrupt the response. In the RIRD condition, each time the participant engaged in PM, the therapist interrupted PM by directing him or her to stand up and engage in one min of physical activity. Physical activities included activities that required the use of both hands; thus, engagement in physical activities was incompatible with engagement in PM. Upon completion of the required one min of physical activity, descriptive verbal praise (e.g., "nice job playing catch," "great job stacking the books") was delivered. This study evaluated the effects of RI with and without redirection on PM. This study is reported as the first study to evaluate the effects of RIRD on Public Masturbation (PM).

Before the evaluation of the treatment procedures, informal observations of each participant were completed to determine whether refinement of the definition of PM was needed. Auto and/or attention screening sessions were completed to determine whether the PM was

automatically reinforced and, in the case of Emily, sensitive to social attention. To determine if PM was maintained by automatic reinforcement, a series of repeated no-interaction sessions were conducted with each participant. The therapist sat on a chair in the room, looked through a magazine/book, and did not attend to the participant. In the current study, RIRD and RI decreased the duration of automatically reinforced PM in four individuals with ASD. However, neither procedure completely eradicated PM, and future research should include FCT to teach clients when and where to engage in sexual behavior. Results from this study suggest that RI required fewer resources than RIRD because RI was brief, easy to implement, and could be implemented by a single therapist. In conclusion, both RI and RIRD led to a decrease of PM to clinically acceptable levels in four individuals ranging in age from 6 years to 20 years.

Cook et al (1978) used a more intrusive punishment-based procedure to decrease public masturbation by a 7-year-old boy across home and school settings. The boy's teacher and teacher's aide and later his mother administered a squirt of 5–10 cc of lemon juice using a squirt bottle into the boy's mouth contingent on public masturbation. The results of this intervention showed that this intervention did decrease the frequency of inappropriate masturbation across home and school settings and was effective when administered across caretakers.

Foxx et al. (1986) evaluated the effects of access to opportunities to earn edibles for performing a high probability stereotypic behavior on public genital stimulation and the stereotypy of a severely retarded [note historical language] male in a special education classroom. Foxx et al (1986), used Differential Reinforcement of Other behavior (DRO) to reduce self-directed inappropriate masturbation in a 16-year-old male diagnosed with a severe level of ID. The researchers evaluated the effects of access to stereotypy and edibles as reinforcers after periods of there was no engagement in genital stimulation, specifically in a

special education classroom. The researchers systematically increased the DRO interval duration up to 45 min. Generalization was programmed by training school personnel and allowing them to deliver the intervention approximately halfway through the study. This intervention did result in decreases in genital stimulation that were seen immediately upon implementing the intervention.

Kaeser and O'Neill, (1987), explored and examined the task-analyzed approach to teaching masturbation. This report presented task-analyzed masturbation instruction for a 29-year-old profoundly mentally retarded [note historical language] male. This individual's sole method of masturbation was to rub his penis against the floor or bed mattress which resulted in very infrequent ejaculations and was potentially dangerous to his genitalia. It was decided to teach this individual a more safe and effective method of masturbation. Data was collected on the frequency and method of masturbatory behavior for 21 days prior to treatment to validate anecdotal reports. The subject was given one introductory verbal cue to initiate masturbation over three sessions with each session containing ten separate trials. The present study held treatment sessions on a sporadic basis and did not follow-up on the subject's ability to initiate the preferred method of masturbation and to achieve ejaculation and orgasm. The researchers noted there was some evidence of generalization throughout the course of the training.

Luiselli et al. (1977), used reinforcement in the form of tokens, but when attempts at modifying masturbation behavior through the reinforcement of incompatible behaviors were unsuccessful. A series of overcorrection responses contingent upon public masturbation were implemented to reduce public masturbation in an 8-year-old boy diagnosed with ID, psychosis, and described as "autistic-like." The tokens used in their study could be exchanged for small edible treats. They found that reinforcing task completion with tokens and implementing overcorrection in the form of physical activity decreased levels of public masturbation.

Withers and Gaskell (1998) conducted a cognitive-behavioral intervention to reduce inappropriate masturbation in an 11-year-old boy with learning disabilities. The intervention used an antecedent-based strategy that involved discussion sessions with the client. The intervention sessions included educating and providing information to the client on appropriate masturbation, as well as teaching him self-control/self-management techniques such as availing himself of distracting thoughts (i.e., police officers approaching him) when he felt the urge to masturbate in public. The researchers also provided the client with children's putty to play with when he became anxious or bored and the client's parents also provided prompting for him to go somewhere private to engage in masturbation and praising the choice of an appropriate location.

Variables of Interest

Experimental Design Characteristics

There were three studies that used a multiple baseline, and one study used a combination of reversal and alternating treatments. Three used single-subject AB designs.

Independent Variable (IV): Three Interventions consisted of punishment-based procedures such as, "Facial Screening," "Response Interruption and Redirection (RIRD)," and "Response Interrupting (RI)" and "Lemon juice". One study used reinforcement procedures of DRO and edibles, one study used a combination of reinforcement and punishment procedures of a Token Economy and Overcorrection and two studies used skill acquisition strategies of Task Analysis (TA) Self Controlling Techniques/ Self-Management.

Dependent Variable (DV): All seven articles had a dependent variable of "frequency or occurrence" of behavior, one also measured the "level of response."

Follow-Up/Maintenance: Two studies followed up after intervention for up to twelve months, two studies followed up until six months, one followed up through one month and two did not follow up after intervention.

Generalization: Of the seven studies, two studies reported generalization across three dimensions (settings, time, people), and five reported generalizations across one dimension. Of those five, four reported generalizations ‘across time’ and one reported generalization across and within participants.

Participants and Setting Characteristics

Across all studies, there were a total of ten participants, nine male and one female. Two of the participants were above the age of 18, and eight were under the age of 18. Four of the participants engaged in inappropriate masturbation in a combination of settings such as in public, at home, and in the classroom at school. Two of the participants engaged in inappropriate masturbation in public or classroom settings primarily. One participant engaged in the target behavior at home, and one also engaged in the target behavior in different settings, one of which was the bus. Diagnosis: five participants were diagnosed with a variation of terminology now referred to as IDD, “mental retardation,” such as “profoundly or severally retarded, learning disabilities,” [note historical language]. Four participants were diagnosed with ASD and one participant was diagnosed with a combination of IDD and ASD and described as Mentally Retarded/psychotic [note historical language] and “autistic-like.”

Procedural Characteristics

Function Determined prior to intervention: Five articles scored a ‘0’ on the 3-point rating scale. Five out of seven articles did not report determining the function of behavior prior to intervention. There were two articles (Cividini-Motta, 2020, Cook et al. 1978) that scored

other than zero on the 3-point rating scale. One article, Cook et al. (1978) scored a '1' on the 3-point rating. Cook did report determining functioning, but procedures utilized would be difficult to replicate. One article, Cividini-Motta, (2020) scored a '2' on the rating scale for function or determining what maintained inappropriate masturbation and providing ample information to produce a replication of procedures.

Reinforcement Based or Punishment Based. Out of the seven articles, only one (Foxx et al., 1986) mentioned solely using behavioral interventions that are considered reinforcement-based procedures. They used DRO with opportunities to earn edibles. Three of the seven articles noted using punishment-based procedures. One used a combination of reinforcement and punishment procedures. Two of the articles used other aspects or procedures in ABA such as, "Task Analysis," and a "self-controlling Technique."

Reinforcement before Punishment: Four articles did report that punishment was used after other procedures had not been successful. The various interventions reported prior to the punishment-based procedures were DRO, verbal reprimands, overcorrection, extinction, and time out (Barmman & Murray). Luiselli et al., (1977) reported both attempting reinforcement prior to the addition of overcorrection, and after attempts at modifying masturbation through the reinforcement of incompatible behaviors, were unsuccessful. Two articles (Cividini-Motta et al., 2020; Cook et al., 1978) did not report reinforcement-based procedures prior to using a punishment-based procedure. One study (Foxx et al., 1986) reported using reinforcement only, and two studies (Kaeser & O'Neill, 1987; Withers & Gaskell, 1998) implemented skill acquisition procedures.

Teaching Alternative/Replacement Behavior: The three studies that used punishment-based procedures did not teach alternative behavior. Of the four studies that taught an alternative

behavior, two used skill acquisition teaching, and two used either solely reinforcement or a combination of reinforcement with a punishment procedure.

Discussion

The purpose of the current literature review was to describe the empirical literature on behavior interventions for inappropriate masturbation, a form of behavior that is under the umbrella term ISB. Specifically, this review described the empirical literature on behavioral interventions for inappropriate masturbation (Barmann & Murray, 1981; Cividini-Motta et al., 2020; Cook et al., 1978; Foxx et al., 1986; Kaeser & O'Neill, 1987; Luiselli et al., 1977; Withers & Gaskell, 1998). The included studies were examined on several characteristics to summarize existing literature on this topic. Limitations and implications for future research are discussed.

Experimental Design Characteristics

There were three studies (Barmann & Murray, 1981; Cook et al., 1978; Foxx et al., 1986) that used a multiple baseline. One study (Cividini-Motta et al., 2020) used a combination of reversal and alternating treatments. Three (Kaeser & O'Neill, 1987; Luiselli et al., 1977; Withers & Gaskell, 1998) used single-subject AB designs. Due to the lack of experimental control in AB design, it is difficult to determine the treatment effects were a result of the intervention.

Although using a reversal design for behaviors of this sort can be unethical because it would be considered unethical to return a participant back to their pre-intervention state, particularly if the behavior could result in harm to the individual, such as inappropriate masturbation with an object or self-injury, or the intervention was beneficial to the participant's health and well-being. An ABAB design can sometimes be used to address this issue because, instead of ending on a baseline, participants will end up in a stage where some kind of treatment

is being provided. Future research should ensure the pros and cons of each type of single subject design on intervention are considered. Furthermore, an example of a single subject design that could be beneficial is the use of adapted alternating treatments design to compare interventions for inappropriate masturbation. Additional examples may be the use of a changing criterion design on replacement behavior taught for inappropriate masturbation that has already shown to be decreasing or may be infrequent, considering changing-criterion designs, require that change must take place in graduated steps, this is not appropriate for behaviors that require immediate change such as frequent inappropriate masturbation but could be used to measure the alternative behavior.

The small number of participants included in each study compromises the external validity of the results and makes it challenging to generalize the study results across age, gender, diagnosis, and setting, in addition to the constraints associated with study design. While several of the studies were strengthened by the use of multiple baseline designs and one strengthened by the use of a reversal design, six of the seven studies only had one participant. Future research should expand the literature on interventions for inappropriate masturbation to increase validity of the literature by performing reviews on past literature as well as continuing to implement more interventions, replicate them and research them.

IV: Three interventions consisted of punishment-based procedures such as, Facial Screening (Barmann & Murray, 1981), RIRD and RI (Cividini-Motta et al., 2020), and Lemon Juice (Cook et al., 1978). One study used reinforcement procedures of DRO and edibles (Foxy et al., 1986). Another (Luiselli et al., 1977) used a combination of reinforcement and punishment procedures of a token economy and overcorrection and two studies used skill acquisition strategies of task analysis (TA) (Kaeser & O'Neill, 1987) and self controlling techniques/ self-

management (Withers & Gaskell, 1998). Future research should continue to examine and ultimately improve these traditional interventions, as well as others such as social stories, differential reinforcement of alternative behavior (DRA) and discrimination training (e.g., between public and private settings).

DV: All seven articles had a dependent variable of frequency/occurrence of behavior, one also measured the level of response. Future research should seek to record data using other measurements as opposed to frequency, as frequency behaviors can be difficult to take in all settings such as schools with limited staff and other students, residential with other clients and other obligations and duties, and in busy families where transporting materials/data sheets is not realistic. When there are many other responsibilities and factors involved frequency measures may actually make the data recording aversive, thus resulting in less or no data being taken, which is not beneficial. Another measure that may be appropriate and adaptable in these settings might be partial interval recording. For example, although frequency may be the best scientific choice for the clinician to choose depending on behavior, as mentioned above it may not be the best choice for the recorder such as the teacher, family or support professionals to take, thus resulting in it not being complete. Therefore, it is important to compromise and work collaboratively. Data is better than no data. With partial interval recording, the behavior may be able to be recorded in intervals of every 5 minutes; however, in others it may be more feasible and recorder friendly to record in 15-minute intervals.

Follow-Up/Maintenance: Only one article (Withers & Gaskell, 1998) followed up to assess maintenance of behavior for a year. The other articles followed up for 1-6 months. Behavior change maintenance occurs when a behavior continues after the intervention is fully or partially withdrawn. While there have been suggested time cut-offs for behavior change and

transition to behavior change maintenance. Kwasnicka et al. (2016) did not indicate a time cut-off as they may vary depending on behavior, context and individual factors. For behavior of this nature future research should seek to evaluate what is an appropriate cut off for behavior of this sort as well as considered developing criteria specific to ISB. Regarding behavior of this nature it must also be considered that while sexual behavior has operant properties and is subject to behavioral interventions, “it is inherently more complex than much of other operant behavior given interactions of hormones, possible medication side effects, social interaction, possible social positive reinforcement, and interaction with media depictions of sexuality combined with vicarious reinforcement, just to name a few” (Stein & Dillenburger, 2017, p.15). Thus, this behavior may return due to more factors; due to the nature of this type of behavior it is important to follow up on, especially in regard to individuals under the age 18.

Generalization: Only two articles (Barmann & Murray, 1981; Cook et al., 1978) generalized intervention across multiple dimensions. The other articles only had generalization across one domain. The potential consequences of this type of behavior are significant, such as negative effects on education and ability to stay in school, community access restrictions, and injuries. Due to the nature of inappropriate masturbation, it could be argued that it is socially significant for generalization to occur across multiple dimensions as opposed to just one. It is paramount to reinforce functional contingencies that increase desired behaviors and decrease undesired or unsafe behaviors as they occur in the individual's daily life. People with IDD or ASD may have difficulty generalizing the skill acquired (Swan et al., 2016) to new or different situations and contexts, highlighting the importance of generalization as well as follow-up to determine if additional post-intervention is necessary for the behaviors as they occur in the individuals' daily life. If inappropriate masturbation is reduced, individuals with IDD and ASD

who exhibit the behavior may have significant life-changing opportunities. Due to the severity of this behavior, generalization and follow-up are crucial. Therefore, in addition to understanding and addressing how generalization occurs in inappropriate masturbation, further research is needed in order to replicate and develop additional strategies to facilitate generalization and follow-up phases for inappropriate masturbation.

Participants and Setting Characteristics: Across all seven studies reviewed there were only a total of ten participants, nine male and one female. Only two of the participants were above the age of 18. The majority of participants engaged in inappropriate masturbation in a combination of settings such as in public, on the school bus, at home, and in the classroom at school. Future research should seek to examine locations where inappropriate sexual behavior occurs more frequently and determine interventions based on settings/sites and resources. An example of this would be comparing data across 6-10 participants who engage in inappropriate masturbation in different settings to determine where the majority of the behavior occurs and then assessing what intervention is the most appropriate and feasible for that specific environment. Future research should also seek to have more female participants as well as those identifying as queer, nonbinary, genderfluid, etc. Future research should seek to obtain written consent from participants, specifically over the age of 18. Future research should seek to develop criteria based on the “human rights” of all individuals, especially individuals with disabilities. To ensure adherence to these rights, researchers may wish to create a “human rights” fidelity checklist, obtain written consent from the individual or guardian, and be able to justify the need for intervention in long-term planning.

Future research should also consider discrimination training in regard to locations. For example, it may be socially appropriate to masturbate in the shower or bathtub alone at home,

but not in a hotel hot tub. Another example may be that it is appropriate to masturbate in the bathroom at home alone but not in the bathroom at school or the bathroom at the local restaurant.

Function Determined Prior to Intervention: In this review, two of the seven studies (Cividini-Motta, 2020; Cook et al. 1978) determined function. Davis et al. (2016) notes that, in instances in which a functional behavior assessment is not feasible or treatment is needed during the time in which the functional behavior assessment is being conducted, non-function-based interventions should be implemented, such as a DRO or noncontingent reinforcement (NCR). Davis et al. (2016) caution there may be ethical considerations that must be taken into consideration when dealing with masturbation such as: abuse history, who should provide instruction, individual consent, intrusiveness of assessment, intrusiveness of the intervention (e.g. when direct instruction is needed, many clinicians should highly consider using synthetic models, video models, social stories, picture schedules etc.). Additionally, it is highly important that practitioners strive not to eliminate healthy sexual behaviors from an individual's repertoire but assist in building or maintaining healthy sexual behavior while eliminating inappropriate masturbation. It is imperative to also be trauma-informed when designing and implementing interventions. For example, a male client may need intervention for inappropriate masturbation; however, while it would typically be considered more appropriate for a male to work with the client due to similar anatomy, due to a history of sexual abuse by a male, to put the client with a male or solely with a male would be considered aversive and potentially doing more harm than good to the client.

Nonetheless, identifying the function of a behavior can be a critical step in developing effective interventions or strategies for modifying that behavior, and identification of the maintaining reinforcer can only serve to better individualize a treatment plan, because

inappropriate masturbation can be and is maintained by a range of reinforcers. Furthermore, behavioral interventions for inappropriate masturbation in individuals with IDD and ASD have typically relied on interventions without prior knowledge of behavioral function. Kahng, Iwata, and Lewin (2002) suggest that behavioral treatments that are based on behavioral function may be more effective than those that are not. Also, pretreatment functional assessments may enable the selection of interventions that are less restrictive and aversive for problem behavior (Fyffe et al., 2004). There was limited literature, and only two of the seven studies reported determining the function. Therefore, future research should seek to expand various types of functional assessments for inappropriate masturbation while taking ethical concerns into consideration. For example, in Cook et al., (1978), prior to the implementation of the lemon juice treatment contingency, the subject's parents and teachers had tried saying a loud “no” and spanking his hand whenever a masturbatory response occurred, as well as an ignoring condition that seemed to dramatically increase the variability of the behavior. Future studies should implement a functional analysis screening tool (FAST), as well as recording ABC data. Future studies should also conduct a Trial-Based Functional Analysis to determine function while taking into account the intrusiveness of the assessment as well as the participants' abuse history and the individual's consent.

Reinforcement-Based or Punishment-Based

Out of the seven articles, only one (Foxx et al., 1986) mentioned solely using behavioral interventions that are considered reinforcement-based procedures, whereas three of the seven articles (Barmann & Murray, 1981; Cividini-Motta et al., 2020; Cook et al., 1978) noted using punishment-based procedures. According to (Cooper, Heron, and Heward, 2019 pg. 36),

reinforcement is the most important principle of behavior and a key element of most behavior change programs designed by behavior analysts.

Reinforcement before Punishment: When trying to make a behavior change, it is typically recommended to use positive reinforcement first, yet few of the reviewed studies did (Barmann & Murray, 1981; Foxx et al., 1986; Luiselli et al., 1977). In accordance with the Behavior Analyst Certification Board (BACB) (2020), Ethics code for behavior analysts: Sections 2.13 Selecting, Designing, and Implementing Assessments; 2.14 Selecting, Designing, and Implementing Behavior-Change Interventions; and 2.15 Minimizing Risk of Behavior-Change Interventions: reinforcement-based procedures and other interventions should be used before punishment. Future research should include more studies that utilize reinforcement-based procedures to determine if the use of the more positive procedure would be even more effective than punishment-based procedures. Future research should use reinforcement first or create criteria for guidelines on when using a punishment procedure without trying reinforcement first could be advantageous to the impact on the quality of life for the client. For example, future research should compare studies about ISB that used reinforcement-based procedures with those that used punishment-based procedures.

Teaching Alternative/Replacement Behavior

The three studies that used punishment-based procedures (Barmann & Murray, 1981; Cividini-Motta et al., 2020; Cook et al., 1978) did not teach alternative behaviors. Stopping one behavior is not teaching an alternative behavior. Alternative behaviors are socially appropriate or positive behaviors taught to replace challenging behaviors (Reeves, 2017). Future research should expand the literature on interventions for teaching replacement behavior for inappropriate masturbation and what those may be. For example, future research could seek to teach alternative

behavior via a discrete-trial functional analysis (DTFA) for the behavior. A DTFA is in natural routines and is used to determine what variables maintain problem behavior. Once a problem behavior is identified, functional communication training (FCT) can be used to replace it with a functionally equivalent response. To determine when to deliver the FCT intervention in a school setting, procedures in the natural environment would be combined with behavioral indications (e.g., observable behavior signaling momentary motivation).

Limitations

This literature review had one primary limitation: the limited number of studies meeting inclusion criteria. Next time, I would expand inclusion criteria to other disabilities and diagnosis. An increased number of included studies would allow for more detailed analysis of variables of interest. For example, the ability to specifically evaluate pre-intervention assessment options and compare their feasibility across varying locations, as inappropriate masturbation occurred at school just as frequently as it did at home or in other public settings. In addition, I would expand search criteria to include all genders. The clients would be evaluated per their own identified pronouns and not their biological anatomy. I would seek to compare inappropriate masturbation across settings. I would take a more stringent measure of generalization and maintenance as well.

Conclusion

In summary, individuals who have IDD or ASD may engage in socially inappropriate masturbation that puts themselves or others at risk for harm. This literature review found that there is limited research. There is also limited research using reinforcement-based procedures or considering the feasibility of interventions for generalization and follow-up. Therefore, more research, assessment and intervention that produces behavior change using function of behavior, reinforcement-based procedures, more participants as well as more diverse participants and

follows up past a year and generalizes across more than one domain and is more representative of the IDD and ASD populations is necessary.

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