

# Mechanisms of self-regulation failure in pornography addiction during adulthood: a critical review

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## SUMMARY

Mechanisms of self-regulation failure in pornography addiction during adulthood: a critical review

*Keywords:* Pornography, Addiction, Self-regulation, Self-regulation mechanism, Self-regulation-failure, Adulthood.

A worldwide increase in pornography addiction (Allen, et al., 2017; Grubbs, Exline, Pargament, Volk & Lindberg, 2017; Harper & Hodgins, 2016; Peter & Valkenburg, 2016; Steelman, 2011) is a mental health concern as it is often associated with dysfunction in sexual arousal and intimate sex (Harper & Hodgins, 2016; Schneider, 2000); depression; loneliness and marital conflict (Fagan, 2009; Newstrom & Harris, 2016). In this study, pornography is viewed from a self-regulation perspective, defined as the ability to monitor and modulate one's own behaviour, feelings, and thoughts in order to pursue long-term goals and to act in accordance with one's values (Berger, 2011; Stosny, 2011).

Even though self-regulation theory provides scientists with a credible departure point to better understand pornography addiction, no studies could be found that attempted to synthesise previous findings and to provide a comprehensive picture or hypothetical model for further research. It is therefore not exactly clear which self-regulation mechanisms are typically involved in pornography addiction, especially during adulthood when the brain reaches maturity regarding self-regulation (Berger, 2011). The aim of this study was therefore to critically review and synthesise the scientific literature for evidence about the mechanisms of self-regulation failure and pornography addiction in adulthood. A second aim was to propose a hypothetical model for self-regulation failure and pornography addiction in adulthood based on a critical reflection of the results gained.

A critical review was done to synthesise the literature and to develop the hypothetical model. Keywords were used in conjunction with Boolean operators to comprehensively search scientific databases linked to EBSCO Discovery Services. Full-text, peer-reviewed, empirical studies published in English from 2000-2019 were included in the search. Critical appraisal was based on criteria from NICE (2012), QCC (2008), and the Joanna Briggs Institute (JBI QARI) (2017) to identify 21 studies for final inclusion in the review. Thematic analysis (Braun & Clarke, 2006) was used to identify themes from these studies. The study was approved by the NWU's ethics committee with approval number NWU-00402-20-A1.

Three main types of self-regulation failures emerged, namely poor emotion regulation, impaired self-control, and poor self-efficacy. In addition, factors like hypersexuality, neuroticism, introversion, gender, religion, and social distress were identified as important role players in the relationship between self-regulation and pornography addiction. A hypothetical model for self-regulation failure and pornography addiction, based on three premises, was proposed, namely (i) there is an interactional effect between self-regulation failure and hypersexuality; (ii) social factors mediate or moderate the relationship between self-regulation failure and pornography use and addiction; and (iii) personality has an interactional effect with self-regulation failure, but also a moderating effect on the relationship between self-regulation failure and pornography use and addiction.

Based on the conclusion and limitations of the study, it was recommended that more research needs to be done to fully understand the complex nature of pornography addiction and especially how it relates to self-regulation and other contextual factors.

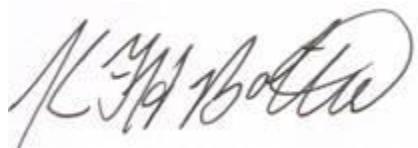
## **PREFACE**

This mini-dissertation adheres to the Rule A 4.4.2.9 of the North-West University predetermined rules and regulations for applying the article model. Furthermore, the entire mini-dissertation adheres to the established guidelines provided by the American Psychological Association (APA: 6th edition), while Chapter 2 adheres to the author's guidelines of the South African Journal of Psychology. The table of contents of the mini-dissertation exhibits sequential page numbers – Chapter 1 begins on page 1 and continues consecutively to the complete reference list at the end of this document.

Simone Barroso is a skilled language editor, registered at the South African Translators' Institute (SATI), who assured that the quality of the language and the layout adheres to the guidelines and regulations of the North-West University. Scientific approval was obtained from the Scientific Committee (COMPRES) of the Faculty of Health Sciences of the North-West University to conduct the critical review. Miss Johanita van Deventer (the researcher) generated the data within the expected fulfilment of the requirements for the Master's degree in Clinical Psychology. The mini-dissertation was submitted to Turnitin to determine similarities in relation to other databases, as well as to provide the North-West University researchers with a report regarding similarities within the norms of acceptable similarities.

## **Permission Letter from Supervisor**

I, Prof Karel Botha, herewith grant permission to Johanita van Deventer to submit this mini-dissertation for examination purposes.

A handwritten signature in black ink, appearing to read "Karel Botha".

6/11/2020

Karel Botha  
Professor  
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## **Declaration**

I, Johanita van Deventer, declare that this research study, *Mechanisms of self-regulation failures in pornography addiction during adulthood: a critical review*, is original work done by myself. This research study forms part of my master's degree in Clinical Psychology done at the North-West University in Potchefstroom. All parties required to provide consent in conducting this research study have done so and all reference material has been acknowledged appropriately.

A handwritten signature in black ink, appearing to read "Johanita van Deventer".

Johanita van Deventer

6/11/2020

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# **CHAPTER 1: INTRODUCTION**

## **Introduction**

This chapter provides a comprehensive literature review on the key concepts of this study. Each concept is defined and important research findings relevant to this study is briefly outlined.

### **Internet pornography**

Internet access is increasing at extraordinary rates – recent studies indicated that 58% of the global population had daily access in 2019 (Masters, 2019). Despite its advantages, Steelman (2011), Harper and Hodgins (2016), Allen, Kannis-Dymand and Katsikitis (2017), and Peter and Valkenburg (2016) indicate that access to the internet also increases exposure to potential harmful websites, including easy access to pornography. According to Kraus, Martino and Potenza (2016), pornography refers to written material or graphic content of a sexually explicit nature that is intended to elicit sexual arousal in the reader or viewer. According to Hald and Stulhofer (2016), there are at least 27 different types of pornography, including those that involve dysfunctional sexual arousal patterns related to sadomasochism, fetishism, bondage and dominance, and bizarre, extreme or violent sex.

Irrespective of the type of pornography involved, however, the primary concern is not pornography use as such, but rather the worldwide increase in pornography addiction (Allen, et al., 2017; Grubbs, Exline, Pargament, Volk & Lindberg, 2017; Harper & Hodgins, 2016; Peter & Valkenburg, 2016; Steelman, 2011). Furthermore, according to de Alarcón, De la Iglesia, Casado, and Montejo (2019), measuring pornography consumption in the general population seems to be a challenge as there is an increase in the ‘Triple A’ factors which includes access,

affordability, and anonymity, for internet usage. According to Rimington and Gast (2007), *access* refers to having entry to the internet at any time and place without any restrictions; *affordability* refers to having easy access to any content within the internet for free or for reasonable rates; and *anonymity* refers to the privacy and secrecy of an individual. As a result of privacy and anonymity, people tend to experience less social danger and anxiety than with face-to-face meetings – this exacerbates and reinforces the likelihood of becoming addicted to internet pornography, as it creates a safe place for the individual to explore and express themselves (Harper & Hodgins, 2016).

## **Addiction**

Volkow (2014) describes addiction as a psychological and physical inability to stop consuming a substance or stop partaking in a certain activity, even though it is causing psychological or physical harm. It interferes with daily life activities and responsibilities, as it hinders successful achievement of an individual's goals and results in decreased wellbeing (Volkow, 2014; Volkow & Morales, 2015; Harper and Hodgins, 2016; Schneider, 2000; Fagan, 2009; Newstrom & Harris, 2016). Krause, Krueger and Briken (2018) recently proposed that pornography addiction should be included in the ICD-11 in a new category, called ‘compulsive sexual behaviour disorder’, characterised by (p. 109) “a persistent pattern of failure to control intense, repetitive sexual impulses or urges, resulting in repetitive sexual behaviour over an extended period that causes marked distress or impairment in personal, family, social, educational, occupational or other important areas of functioning”.

A key factor in pornography addiction, similar to substance use disorders, is the development of tolerance, in this case referring to a gradual decrease in the perceived positive effect of viewing pornography, subsequently resulting in an increased craving for more despite

its associated risks and negative consequences (Allen, et al., 2017 & Grubbs, et al., 2017). Furthermore, as the human brain is bound to increase pleasurable activities, the chances of pleasurable activities being repeated are highly possible (Volkow, 2014). Tolerance and addiction develop because brain chemistry is altered – according to Botswick and Bucci (2008), more dopamine is released into the brain when an individual has prolonged exposure to pleasurable stimuli like pornography. Dopamine causes feelings of reward and pleasure, and as a result, good-feeling hormones such as serotonin and oxytocin are also increased, all contributing to an increase in the frequency of viewing pornography and subsequently, increased tolerance (Botswick & Bucci, 2008).

### **Pornography addiction**

The impact of dysfunctional pornography usage on an individual can be understood in a recent study by Wardecha, Wilk, Kowalewska, Skarko, Lapinski and Gola (2018), where the majority of patients treated for compulsive sexual behaviour stated that they experienced negative emotions, feelings of loneliness, depression, and anxiety after viewing pornography. Furthermore, problematic internet pornography use by both men and women includes symptoms such as dysfunction in sexual arousal and decreased interest and pleasure in the individual's real or romantic partner (Harper & Hodgins, 2016; Schneider, 2000). Regarding the impact of excessive pornography use on families, the pornography user might lose interest in their partners, have trouble with sexual arousal, have a depressed mood, experience a preoccupation with the internet, and isolate themselves in order to fulfil their desire or craving for pornography. Subsequently, their families might feel unprioritised, abandoned, confused and worthless. In addition, spouses and partners of users might feel that their partners are emotionally disengaged or have lost interest in their relationship with them (Fagan, 2009; Newstrom & Harris, 2016).

It is therefore not surprising that, according to Doran and Price (2014), pornography addiction has several implications for the individual, family, and society. First, it seems to increase the likelihood of divorce and infidelity among couples. Stewart and Szymanski (2012), for example, found that women's reports of their male partners' frequency of pornography use were negatively associated with the quality of their relationships. Secondly, pornography addiction seems to be associated with diminishing conservative morals and more divergent views of inappropriate sexual activities (Peter & Valkenburg, 2016). This finding is supported by Malamuth and Huppin (2005), who indicate that adolescents who are exposed to pornography that depict irregular sexual acts such as rape and humiliation appear to favour that kind of sexual behaviour.

A study done by The Youth Market Research Unit (The South African, 2015) shows that 29,2% of South African High School learners intentionally accessed pornographic material, 77,6% viewed pornographic sites occasionally, and 9,1% accessed these sites daily. In addition, Business Tech (2015) revealed some statistics regarding the popular online pornographic provider Pornhub, indicating that South Africans has a strong demand for pornography and a wide variety of certain types of pornography. Regarding ethnic groups who reported to view pornography, 57% were African, 31% white, 6% coloured people, and 7% Indian (Daily Maverick, 2014). Furthermore, 75% of the surveyed population reported that they were Christians, and 12% atheists. In addition, 41% of these respondents were married, with children, and 6% were pregnant women (Daily Maverick, 2014).

### **Self-regulation**

From a psychological perspective, addictive behaviour is perhaps best understood from a self-regulation perspective. Self-regulation is defined as an individual's ability to monitor and

modulate their behaviour, feelings, and thoughts in order to pursue long-term goals as well as the act of being consistent with one's values (Berger, 2011; Stosny, 2011). In addition, according to Baumeister and Vonaesch (2014), self-regulation refers to a process where the self manages, changes and alters reactions in pursuit of a desired outcome. Therefore, self-regulation refers to a procedural ability of an individual to modulate and change their own behaviour, thoughts, and feelings, in order to pursue goals that are in line with their values. Self-regulation consists of four broad phases, namely goal setting, goal execution, correction of behaviour, and goals – each based on the linear feedback loop of reference, input, comparison, and output, according to Carver and Scheier's original cybernetic control theory (1982). According to this theory, *reference* refers to self-regulation mechanisms which include any resource, skill or effort that an individual applies to ensure their behaviour is directed at goal achievement, or to correct or change behaviour or a goal itself once a deviation from the goal is perceived. *Input* refers to the sensing and perception of the present condition, which is then *compared* to a point of reference. The *output* is the behaviour that is carried out to decrease perceived inconsistencies between the reference and present state.

Typical self-regulation mechanisms include goal intentions (*aimed and planned achievements*) and outcome expectancies (*positive or negative anticipated consequences*) (Gollwitzer & Oettingen, 2016); self-efficacy (*personal judgement of one's ability or belief to succeed in order to execute specific behaviours*), self-monitoring (*an ability to regulate one's behaviour in order to adapt to social situations*), and behavioural modulation (*changing behaviour in order to achieve a specific goal*) (Mackenzie, Mezo & Francis, 2012); executive functioning, for example *planning and judgment* (Blair, 2016); attentional deployment (*directing attention away or to a certain situation*) (Barkley, 2016); cognitive flexibility (*shifting one's*

*(thoughts to different dimensions at a time)* (Ionescu, 2012); shifting between incompatible rules (*shifting rules which are not able to exist or fit together*) (Berger, 2011); self-control (*regulating one's behaviour in order to achieve specific goals*) (Berger, 2011; Inzlicht & Schmeichel, 2016, Maranges & Baumeister, 2016); postponing acting on a desired object or goal (Berger, 2011); and compensation for ego-depletion (*changing behaviour when resources run out or if energy has been exerted*) (Hoyle & Davisson, 2016).

Effective application of self-regulatory mechanisms allows a person to, for example, plan properly, make appropriate decisions, resist temptations and delay gratification, resolve conflict, and anticipate and deal with sudden or gradual change. These behavioural outcomes are the result of a curvilinear process in which both positive and negative feedback loops are activated in order to allow for change and flexibility between various states of being – emotional regulation, for example, operates on different levels of response depending on an individual's current active goals (Dewitte, 2016). It is therefore not surprising that effective self-regulation is associated with mental health, wellbeing, and life and job satisfaction (Gollwitzer & Oettingen, 2016). In contrast, frequent or long-term self-regulation failure may contribute to the development of job inefficiency, interpersonal problems, eating and addictive behaviour, and clinical depression (Berger, 2011; Straumann, 2017). Self-regulation is dependent on a chain of developmental processes, including brain maturation in the frontal cortex and myelination of its functional connections through childhood and adolescence (Berger, 2011). This study focuses on pornography addiction during adulthood (18 years and older) (Furlong, 2016) to exclude the possible contribution of uncompleted developmental processes in favour of specific self-regulatory failures.

## **Self-regulation challenges related to sexual needs during adulthood**

During adulthood, pornography may challenge an individual's self-regulation skills in different ways. It may, for example, threaten existing short-term goals like completing an important task or long-term goals like abstaining from certain sexual temptations. Pornography exacerbates the existing challenge that people generally have strong sexual urges, often fuelled by a natural curiosity in, and strong reaction to, visual sexual cues. These factors, combined with a lack of self-monitoring, poor self-efficacy, poor emotion regulation (Sayette & Cresswell, 2016) and poor self-control, specifically related to compulsive sexual behaviour (Krause et al, 2018), may make any specific individual susceptible to engaging in more than just accidentally viewing pornography.

Compulsive sexual behaviour (otherwise known as sexual addiction or hypersexuality) refers to a recurrent and persistent preoccupation with sexual fantasies, urges, and behaviours that are difficult to control (Krause et al, 2018). Symptoms that include uncontrollable sexual urges, behaviours that lead to guilt, recurrent and intense fantasies, and difficulties in establishing and maintaining stable relationships result in individuals experiencing distress as they have no control over these symptoms (Krause et al, 2018). Furthermore, compulsive sexual behaviour also includes general sexual experiences such as masturbation, cybersex, use of pornography, and multiple sex partners (Krause et al, 2018). Therefore, the risk of these behaviours and symptoms is that, as soon as sexual behaviour increases to such a point where it becomes a priority, individuals may struggle to successfully self-regulate (Krause et al, 2018).

Individuals who struggle to self-regulate might find it difficult to function efficiently at their work or social lives, as they continuously experience an intense urge to gratify their sexual impulses (Krause et al, 2018). According to Sayette and Cresswell (2016), one might

*underregulate* by failing to exert control over oneself, for example, not being able to effectively resist the temptation of visiting pornography websites. In addition, one might *misregulate* by exerting control in incorrect ways that results in failure to produce a desired outcome, for example by deciding to watch only pornographic images instead of pornographic videos in the hope that it would decrease the addiction. To complicate matters further, pornography may even become a compensatory measure for meeting of unmet psychological or sexual needs. For example, Borgogna, McDermott, Berry and Browning (2019) found that men with low self-esteem may be especially drawn to pornography, potentially as a way of over-conforming to and performing certain male role norms. In cases like these it would be hard for individuals to apply effective mechanisms like self-control, as unmet needs strongly influence or motivate behaviour (Sheldon, 2011).

### **Addiction from a self-regulation perspective**

Recently, Roos and Witkiewitz (2017) proposed a contextual model of self-regulation change mechanisms within individuals with addictive disorders. It proposes that self-regulation as a change mechanism depends on contextual factors in the immediate situation, for example fluctuating internal cues like negative affect and external cues like visual exposure to a drug, as well as factors in the broader context, for example life stressors and environmental conditions. Both external and internal cues can elicit substance craving and substance use; often individuals are exposed to multiple cues simultaneously. The individual therefore needs to accurately distinguish between different cues to select the most effective self-regulation strategy.

Individuals with addictive disorders will be guided by skills they already have, also known as their self-regulation repertoires (distinct patterns of self-regulation over a period of time). When attempts to reduce urges for a substance fail, the individual must be able to change their

efforts and implement new self-regulation skills rather than merely control the cause of the urge. Although the current study does not focus on substance addiction nor attempts by the addict to change their behaviour, the model provides a good example of the dynamic relation between self-regulation, addiction, and context.

## **Conclusion**

It is clear from the literature that pornography addiction has an altering impact on the quality of life of individuals, relationships, and families, and that a number of important studies exploring the relationship between self-regulation and pornography addiction have been done. Effective self-regulation seems to be necessary for the ability to appropriately regulate biological and psychological urges specifically and for the individual's holistic well-being in general. Self-regulation failure can therefore lead to dysfunctional habits, inappropriate application of biological and psychological urges, and decreased well-being.

## **Preview of Chapters 2 and 3**

Chapter 2 is presented as a manuscript that will be submitted for publication in an accredited journal. It argues that even though self-regulation theory provides scientists with a credible departure point to better understand pornography addiction, it is not exactly clear which mechanisms are typically related to pornography addiction, especially during adulthood when brain maturation toward self-regulation is supposed to be completed, how and why these mechanisms fail, and how they relate to gender. Therefore, the aim of Chapter 2 is to critically review and synthesise the scientific literature for evidence about the mechanisms of self-regulation failure and pornography addiction in adulthood. In addition, a hypothetical model for self-regulation failure and pornography addiction in adulthood is developed that is based on a

critical reflection of the results gained. The methodology, process, data analysis, and results are also presented, discussed, and integrated in Chapter 2.

Chapter 3 concludes this study by providing the students' personal reflection on the process, experience, and outcome of the study.

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## **CHAPTER 2: ARTICLE**

### **2.1. Guidelines for Authors**

This article (as part of this mini-dissertation) will be submitted for possible publication in the South African Journal of Psychology. Thus, there follows, firstly, a summary of the author's guidelines for the specific journal, followed by the article.

#### **Summary of Instructions for Authors**

##### **Article Types**

The South African Journal of Psychology considers submissions addressing South African, African or international issues, including:

1. Manuscripts reporting on research investigations.
2. Review articles focusing on significant issues in Psychology.

New submissions should not exceed 5500 words, including references, tables, figures, etc.

Authors of manuscripts returned for revision and extension should consult the Editorial Office regarding amended length considerations. All manuscripts should be written in English and include an abstract of not more than 250 words. The writing must be of a high grammatical standard, and follow the technical guidelines stipulated below. The publication guidelines of the American Psychological Association 6<sup>th</sup> edition (APA 6<sup>th</sup>) must be followed in the preparation of the manuscript. Manuscripts of poor technical or language quality will be returned without review.

## **Preparing a Manuscript for Submission**

**Formatting.** Manuscripts should be submitted as a Word Document only. Templates are available on the Manuscript Submission Guidelines page of our Author Gateway. The text should be double-spaced throughout and with a minimum of 3cm for left and right-handed margins and 5cm at head and foot. Text should be standard 12 point.

**Journal Style.** The South African Journal of Psychology conforms to the SAGE house style. Research-based manuscripts should use the following format: The introductory/literature review section does not require a heading, thereafter the following headings/subheadings should be used.

Method (participants; instruments; procedures; ethical considerations; data analysis [which includes the statistical techniques or computerized analytic programmes, if applicable]; results; discussion; conclusion; references.

The ‘ethical considerations’ section must include the name of the institution that granted the ethical approval for the study (if applicable)

**Keywords and abstracts.** Helping readers find your article online Authors should include (a) an Abstract of up to 250 words and (b) up to 6 alphabetized keywords. The title, keywords and abstract are key to ensuring readers find your article online through online search engines such as Google. Please refer to the information and guidance on how best to title your article, write your abstract and select your keywords by visiting SAGE’s Journal Author Gateway Guidelines on How to Help Readers Find Your Article Online.

**Artwork, figures and other graphics.** For guidance on the preparation of illustrations, pictures and graphs in electronic format, please visit SAGE’s *Manuscript Submission Guidelines*.

Figures supplied in colour will appear in colour online regardless of whether or not these illustrations are reproduced in colour in the printed version. For specifically requested colour reproduction in print, you will receive information regarding the costs from SAGE after receipt of your accepted article.

**Supplementary material.** The *South African Journal of Psychology* does not currently accept supplemental files.

**Reference style.** *South African Journal of Psychology* adheres to the APA reference style. View the APA guidelines to ensure your manuscript conforms to this reference style.

**English language editing services.** Authors seeking assistance with English language editing, translation, or figure and manuscript formatting to fit the journal's specifications should consider using SAGE Language Services. Visit SAGE Language Services on our Journal Author Gateway for further information.

## **Article**

Mechanisms of self-regulation failure in pornography addiction during adulthood: a critical review

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## **Abstract**

Pornography addiction has a substantial impact on the quality of life of individuals, relationships, and families. It is however, still not clear how self-regulation mechanisms are related to pornography addiction during adulthood. Therefore, the aim of this study is to (i) critically review and synthesise the scientific literature for evidence about the mechanisms of self-regulation failure and pornography addiction in adulthood; and (ii) to develop and propose a hypothetical model for self-regulation failure and pornography addiction in adulthood. Keywords were used in conjunction with Boolean operators to comprehensively search scientific databases. Three main types of self-regulation failures emerged, namely poor emotion regulation, impaired self-control, and poor self-efficacy. In addition, factors like hypersexuality, neuroticism, introversion, gender, religion, and social distress were identified as important role players in the relationship between self-regulation and pornography addiction. A hypothetical model for self-regulation failure and pornography addiction, based on three premises, is proposed. Recommendations are specifically made for further research.

*Keywords:* Pornography, Addiction, Self-regulation, Self-regulation mechanism, Self-regulation-failure, Adulthood.

## **Introduction**

Accessibility, affordability, and anonymity offer internet users a secure and comfortable cyber-environment (Cooper, 1998; Cooper, Delmonico & Burg, 2000; Rimington & Gast, 2007). These factors allow internet users to search and explore unlimited information, images, videos, websites and other content without any inconvenience or restrictions within the comfort of any chosen environment. Despite the advantages of unlimited access to the internet, disadvantages include harmful or disturbing websites or images, cyberbullying on social media platforms, trafficking, and various sexually explicit material (Cooper et al., 2000).

South Africans seem to have a strong demand for a wide variety of pornographic material (Business Tech, 2015). Pornography statistics show that 29.2% of South African High School learners intentionally accessed pornographic material, 77.6% viewed pornographic sites occasionally, and 9.1% accessed these sites daily (The South African, 2015). Furthermore, recent studies (iMeMovement, 2017) have indicated that South Africa was the top mobile device consumer on the popular pornographic provider, PornHub, and in terms of time spent per viewing, South Africa came in second in world rankings.

Unlimited access at affordable prices at any time or duration of time can lead to, among others, possible pornography addiction (Harper & Hodgins, 2016). According to Volkow (2014, p.109), pornography addiction can be characterised as “a persistent pattern of failure to control intense, repetitive sexual impulses or urges, resulting in repetitive sexual behaviour over an extended period that causes marked distress or impairment in personal, family, social, educational, occupational or other important areas of functioning”. A key maintaining factor in addiction is that of tolerance and an increased craving for more of the wanted substance (in this case, pornography) (Allen et al., 2017; Grubbs et al., 2017). The human brain constantly desires

pleasure in order to release dopamine, a neurotransmitter associated with reward – subsequently, activities that cause pleasure are strongly encouraged by the brain (Volkow, 2014), and engaging in these activities builds an increasing tolerance for them, which can eventually lead to addiction (Allen et al., 2017; Grubbs et al., 2017a; Volkow, 2014). This not only results in dysfunctional pornography usage (Harper & Hodgins, 2016; Schneider, 2000; Wardecha et al., 2018), but also reflects the individual's inability to self-regulate his or her own behaviour.

According to Berger (2011) and Stosny (2011), self-regulation refers to a procedural ability to modulate and change one's functioning and self (behaviour, thoughts, feelings, etc.) in order to pursue goals that are in line one's values. Self-regulation includes four broad phases, namely goal setting, goal execution, correction of behaviour, and correction of goals. Each phase is based on the linear feedback loop of reference, input, comparison and output, according to Carver and Scheier's (1982) original cybernetic control theory. When applying effective self-regulation mechanisms, appropriate decisions can be made, conflict can be resolved, and temptations could be resisted, resulting in healthy functioning within social, occupational and emotional levels (Gollwitzer & Oettingen, 2016). In contrast, consistent self-regulation failure can contribute to interpersonal, intrapersonal and occupational challenges (Berger, 2011; Straumann, 2017).

Even though self-regulation theory provides scientists with a credible departure point to better understand pornography addiction, it is not exactly clear which mechanisms are typically involved, especially during adulthood when brain maturation toward self-regulation is supposed to be completed (Berger, 2011). No studies could be found that attempted to synthesise previous findings and to provide a comprehensive picture or hypothetical model of emerging themes in this regard. By addressing this gap, the findings of this study may provide suggestions regarding

(i) the need and focus of further research; and (ii) intervention and therapeutic guidelines for counsellors and psychologists working with adults addicted to pornography.

The aim of this study is therefore to critically review and synthesise the scientific literature for evidence about the mechanisms of self-regulation failure and pornography addiction in adulthood. A second aim is to propose a hypothetical model for self-regulation failure and pornography addiction in adulthood based on a critical reflection of the results gained.

## **Method**

### **Research design**

A critical review, based on the guidelines by De Klerk and Pretorius (2019), was done to synthesise the literature and to develop the hypothetical model. A critical review is an extensive exploration of research, which is critically evaluated, analysed and theoretically innovated (Grant & Booth, 2009). The resulting product is not an endpoint, but a starting point for further research (Grant & Booth, 2009). A critical review is deemed appropriate for this study as it gives the researchers an opportunity to critically explore the mechanisms of self-regulation failure related to pornography addiction and to develop and propose a hypothetical model for further empirical investigation.

### **Search Strategy**

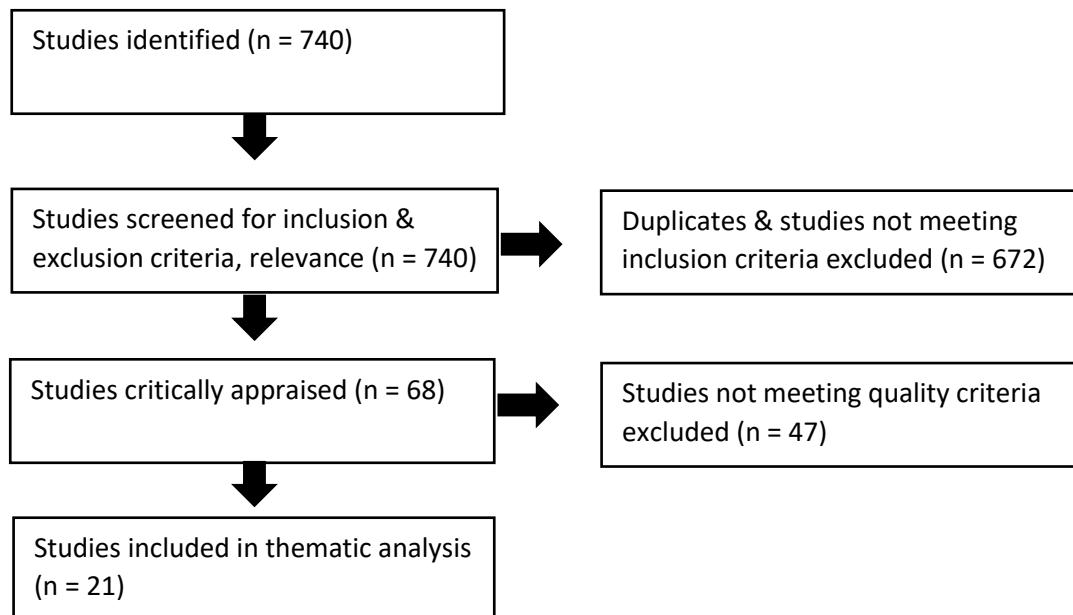
**Keywords.** The following keywords were used in conjunction with Boolean operators in the search: ‘Pornography’, ‘pornography use’, ‘pornography addiction’, ‘Self-Reg\*’, ‘Self-Control’, ‘Executive funct\*’, ‘Impuls\*’, ‘Gratification delay’, ‘self-efficacy’, ‘modulation’, ‘mechanism’, ‘failure’, ‘impulsive’, ‘compulsive’, ‘adulthood’.

**Databases.** The Google Scholar, ScienceDirect, PsycARTICLES, PsycINFO, and JSTOR databases were searched through the EBSCO Discovery Services of the North-West University (NWU). The search was assisted by a librarian on the NWU's Potchefstroom campus.

**Inclusion Criteria.** Studies were only included if they were full-text, peer-reviewed, empirical studies published in English from 2000-2019. Target populations were adults 18 years and older, based on the reason that children's and adolescents' ability to effectively self-regulate is still being developed and not yet supposed to be fully effective (Berger, 2011; Peter & Valkenburg, 2016).

### Relevancy and Critical Appraisal Process

Figure 1 shows the process and outcome of search, relevancy, and critical appraisal process. Initially, 740 studies were identified. After duplicates and non-empirical studies had been removed, the two researchers assessed study relevancy independently based on inclusion criteria as well as the focus of each study.



**Figure 1.** Search, relevancy and critical appraisal process

The final group of possible studies (n=30) were then critically appraised to ensure scientific quality. Criteria were selected from the National Institute for Health and Care Excellence (NICE, 2012), the Quality Criteria Checklists (QCC) of the American Dietetic Association [ADA], 2008), and the Joanna Briggs Institute (JBI QARI) (2017) to develop the following questions:

- Is there a clear problem statement?
- Is there a clear research question?
- Are the aims and objectives clear?
- Does the study have a clear and valid research approach and design?
- Is there consistency between the research methodology and the research questions, aims, objectives and data collection methods?
- Are the results of the study clearly and consistently shown and reported?
- Is there a clear and convincing conclusion?
- Are study limitations clearly noted?

## **Data Extraction**

Extracting data comprised of reading the full text of each article and extracting relevant information such as the publication dates, authors, methodologies, research designs and aims. The reviewer thus moved between reading articles, extracting data while analysing and synthesizing the themes that emerged (Noyes & Lewin, 2010). Extracted data were copied on a separate document to avoid omissions or mistakes. Table 1 shows the identifying aspects (title, journal, methodology, etc) as well as a summary of the core findings that were extracted from each of the 21 studies.

**Table 1.** Data Extraction Table

No.	Title of Article	Authors and Publishing date	Methodology	Data-analysis	Core Findings
1.	Revisiting the Role of Impulsivity and Compulsivity in Problematic Sexual Behaviors.	Böthe, B., Tóth-Király, I., Potenza, M. N., Griffiths, M. D., Orosz, G., & Demetrovics, Z. (2019).	Quantitative design with an online questionnaire. Sample size of 17 090.	Structured Equations Modelling with SPSS 21 and Mplus 7.3 (Muthén & Muthén, 1998–2015)	Compulsivity and impulsivity may not contribute directly to problematic pornography use. Impulsivity may play a bigger role in hypersexuality than in pornography use.
2.	Characteristics and Behaviors of Sexual Compulsives Who Use the Internet for Sexual Purposes.	Daneback, K., Ross, M. W., & Mansson, S. (2006).	Quantitative method. Adult sample of 1 835 (931 women, 904 men).	Binary logistic regression using SPSS 10.0.	Time spent online was not a direct predictor for sexual compulsivity. Offline sexual behaviours can increase or decrease or remain unchanged for individuals who use the internet for sexual purposes.
3.	Gender Differences in Implicit Processing of Sexual Stimuli	Dewitte, M. (2016).	Quantitative method by means of 4 experiments. Sample 284 adults from both genders.	ANOVA was used.	Males were more motivated to approach sexual stimuli than females, but also better in inhibiting sexual information. There were no differences across gender regarding the evaluation of sexual information.
4.	Can Pornography be Addictive? An fMRI Study of Men Seeking Treatment for Problematic Pornography Use	Gola, M., Wordecha, M., Sescousse, G., Starowic, M. L., Kossowski, B., Wypych, M., Makeig, S., Potenza, M. N., & Marchewka, A. (2017).	Quantitative study. Ages ranges between 18–48 years, including 57 heterosexual males participated in the fMRI study.	General Linear Models (GLMs) and Fisher's F tests were used (ANOVA with trial Type] with SPSS 22 were used.	Problematic pornography use were associated with the anticipatory processing of cues specifically predicting erotic rewards, suggesting it to be a behavioural addiction, and possibly be treated in that way.
5.	Transgression as Addiction: Religiosity and Moral Disapproval as Predictors of	Grubbs, J. B., Exline, J. J., Pargament, K. I., Hook, J. N., & Carlisle, R. D. (2015a).	A quantitative method by means of d two cross-sectional analyses. Study- 1 used undergraduate	Multivariate analysis of variance (MANOVA)	Religiosity and moral disapproval were predictors of perceived addiction to Internet pornography but are unrelated to pornography use.

	Perceived Addiction to Pornography		students from secular universities (N=331). Study-2 used a sample of undergraduate students from a religiously affiliated university (N=97). Study-3 used a web-based sample of adults (n=208).		Compulsivity was a measure of pathological interpretations of pornography use. Religiosity consistently predicted variance in perceived addiction. The above persisted with the following variables remaining controlled – neuroticism, self-control, and socially desirable.
6.	Self-identification as a pornography addict: examining the roles of pornography use, religiousness, and moral incongruence.	Grubbs, J. B., Grant, J. T., & Engelman, J. (2018).	Quantitative design and usage of Open Science Framework. Adult sample of 2 220.	Exploratory analyses and Chi-square contingency analyses.	Results indicated that men and their average daily use of pornography were associated with self-identification as a pornography addict. Moral incongruence emerged as a predictor of self-identification as a pornography addict.
7.	Internet Pornography Use: Perceived Addiction, Psychological Distress, and the Validation of a Brief Measure	Grubbs, J. B., Volk, F., Exline, J. J., & Pargament, K. I. (2015b).	Mixed Method Approach. Study 1 –sample of 269 (227 men, 42 women). Study 2 – sample of 214 (136 men, 74 women, 3 transgender, 1 unreported). Study 3 – sample of 152 (103 men, 49 women).	Confirmatory factor analysis	Perceived addiction to Internet pornography is more associated to psychological distress than use of internet pornography.
8.	Moral disapproval and perceived addiction to internet pornography: a longitudinal examination	Grubbs, J. B., Wilt, J. A., Exline, J. J., Pargament, K. I., & Kraus, S. W. (2017)	The quantitative approach using a survey design. Sample 1 – 1 507 undergraduate students from three US universities Sample 2 -782 internet - using adults. Subsets of sample 1 & 2 were measured again the following year.	Longitudinal analysis was used for the study	Perceived addiction to internet pornography correlated strongly with moral principles.
9.	Examining Correlates of Problematic Internet Pornography Use Among University Students	Harper, C., & Hodgins, D.C. (2016).	Quantitative method. Sample of 105 female and 86 male university students (mean age 21).	Sequential polynomial regression analysis and Descriptive thematic analysis.	Single individuals reported more frequent use of internet pornography than those in relationships. Daily internet pornography use was associated with poorer psychosocial functioning and problematic alcohol,

					cannabis, gambling, and video game use and could lead to addiction.
10.	Affection substitution: The effect of pornography consumption on close relationships.	Hesse, C., & Floyd, K. (2019).	Quantitative method. 357 participants (162 men and 192 women). Ages ranging from 20 years to 73 years, with a mean age of 38.73 years.	Exploratory factor analysis	Pornography consumption is a form of coping mechanism and used as a form of affection substitution for those who are deprived of affection.
11.	Clinical Characteristics of Men Interested in Seeking Treatment for Use of Pornography	Kraus, S. W., Martino, S., & Potenza, M. N. (2016).	A quantitative approach was used by means of an internet-based data-collection procedure. A sample of 1 298 male pornography users were recruited.	Mann–Whitney U test, Pearson chi-square test, and a binary logistic regression analysis with SPSS-22 were used.	Treatment interest can be explained by user's loss of control over their sexual thoughts and behaviours. Men who were interested in treatment reported more failed attempts, hypersexual symptoms, strong cravings and difficulty in regulating pornography use.
12.	The development and initial evaluation of the Pornography-Use Avoidance Self-Efficacy Scale	Kraus, S. W., Rosenberg, H., Martino, S., Nich, C., & Potenza, M.N. (2017).	Quantitative method by means of an internet-based data-collection. A sample size of 229 male pornography users, with an average age of 33.3 years who had sought or considered seeking professional help for their use of pornography.	SPSS-21 was utilized to conduct one-way analyses of variance (ANOVAs) to examine context-specific self-efficacy to avoid using pornography.	Self-control coping skills can be used to help patients avoid using pornography in situations where they have little confidence. Higher confidence can be used to avoid pornography use.
13.	Sexual addiction, compulsivity, and impulsivity among a predominantly female sample of adults who use the internet for sex.	Levi, G., Cohen, C., Kaliche, S., Sharaabi, S., Cohen, K., Tzur-Bitan, D., & Wienstein. A. (2020)	Quantitative approach using a survey design. Sample of 175 participants with a mean age of 33.3 years	Multiple regression analysis with SPSS	Symptoms of obsession and compulsion contributed to online sexual addiction among individuals who use internet platforms for sexual partners. Problematic online sexual activity and impulsivity added to sex addiction.
14.	Men's enjoyment of explicit erotica: Effects of Person- specific attitudes and gender-specific norms.	Lopez, P. A., & George, W. H. (1995)	Quantitative method. Sample of 167 heterosexual individuals	Analysis of Variance (ANOVA) was utilized.	Results suggested that erotica enjoyment is a gender type behaviour. Individual's enjoyment can be influenced by predisposition and normative situational cues.
15.	What Is the Relationship Among	Maddock, M. E., Steele, K., Esplin, C.	A 6-month Longitudinal study and preregistered	A structural equation model	Self-perceived problematic pornography use was not related to religiosity.

	Religiosity, Self-Perceived Problematic Pornography Use, and Depression Over Time?	R., Hatch, S. G., & Braithwaite, S. R. (2019).	with an Open Science Framework. Sample of 320 participants from different ethnic groups and sexual orientations.	was used with data from a three-time point (baseline, 3-month, and 6-month).	Excessive pornography use at 3 months was associated with increased depression at 6 months.
16.	Accounting for the Social Triggers of Sexual Compulsivity.	Parsons, J. T., Kelly, B. C., Bimbi, D. S., Muench, F., & Morgenstern, J. (2007)	Qualitative method. The sample consisted of 180 adult gay and bisexual men.	A grounded theory approach was used.	Social triggers including event-centred triggers and contextual triggers can have detrimental implications for the individuals at risk for pornography addiction.
17.	The Effects of Mindfulness on Sexual Outcomes: The Role of Emotion Regulation	Pepping, C. A., Cronin, T. J., Lyons, A., & Caldwell, J. G. (2018).	Quantitative approach. Two samples: 1. Individuals in a committed romantic relationship (N=407). 2. Single Individuals (N=400).	Correlations, Independent samples t-test & the PROCESS macro was utilized.	Dispositional mindfulness was associated with increased adaptive sexual system functioning, sexual satisfaction, and fewer problematic pornography use.
18.	Problematic Internet use (PIU), personality profiles and emotion dysregulation in a cohort of young adults.	Pettoruso, M., Valle, S., Cavic, E., Martinotti, G., di Giannantonio, M., & Grant, J. E. (2020)	Quantitative method (cross-sectional design). Sample of 428 adults between 18-29 years (males and females included) as well as Caucasian and African-Americans.	Non-parametric testing with SPSS 24.0	Problematic internet usage is intended for escaping negative effects. Difficulties in emotional regulation for introverted individuals could be a risk factor for the development of problematic internet usage.
19.	Investigating Correlates of Hypersexual Behavior in Religious Patients	Reid, R.C., Carpenter, B. N., & Hook, J. N. (2016).	Mixed-method approach. A sample of 52 religious and 105 non-religious men.	Factor analysis	Religiosity is not related to self-reporting of hypersexual behaviour among men who seek treatment. Characterisation of hypersexual disorder is mostly the same for religious versus non-religious individuals. Religious individuals had lower rates of addictive behaviour.
20.	Psychological characteristics of individuals who engage in online sexual activity.	Squirrell, M. (2011).	Quantitative method. A sample of 1 325 participants, 18 years and older. 1 211 men (91.4%) and 114 women (8.6%).	The analysis of variance tests (ANOVA) was used.	Men tend to engage more in online sexual activity than women. Secure attachment in individuals had a higher correlation with less online sexual activity. More time spent online was also associated with feelings of loneliness, depression, anxiety, stress, impulsivity and social and emotional isolation.

21.	Predictors for (Problematic) Use of Internet Sexually Explicit Material.	Stark, R., Kruse, O., Snagowski, J., Brand, M., Walter, B., Klucken, T., & Wehrum-Osinsky, S. (2017)	Qualitative design with questionnaires and Approach- Avoidance Task (AAT). Sample of 47 women and 48 men between 18 & 44 years.	ANOVA & bivariate correlations with SPSS (Version 22, IBM)	Sexual motivation as a trait is a risk factor for the development of a clinical disorder which can be characterised by compulsive sexual behaviour and as loss of control
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## **Data Analysis and Synthesis**

Thematic analysis (Braun & Clarke, 2006) was used to identify patterns and themes in six steps: (i) Each of the final included studies were carefully read to facilitate familiarisation with the content; (ii) sections related to the research question were coded by using a highlighter; (iii) tables were developed to summarise the coded data into themes and subthemes; (iv) themes and subthemes were reviewed by both the two researchers and refined to ensure that there were clear divisions between the themes; (v) themes were further refined and synthesised; and (vi) final themes and were recorded down. Finally, to meet the aims of a critical review (De Klerk & Pretorius, 2019; Grant & Booth, 2009), the identified themes were critically integrated to develop a hypothetical model for understanding self-regulation failure in pornography addiction.

## **Ethics**

Critical reviews are regarded as no-risk studies; however, it was still necessary to maintain the ethical responsibility of ensuring rigour throughout the process. Therefore, the ethical guidelines of Wager and Wiffin (2011) were applied through continuous self-reflection, honest and transparent reporting and by using Turnitin to avoid plagiarism. The study was approved by the NWU's ethics committee with approval number NWU-00402-20-A1.

## **Results**

Twenty one (21) studies were included in the review – of these, 15 studies (71.4%) were published between 2016 and 2020, three studies (14.2%) between 2011 and 2015; two studies (9.5%) between 2005, and 2010 and only one study (4.7%) before 2000. Seventeen (17) studies (80.9%) followed a quantitative approach, three studies (14.2%) followed a mixed-method approach, and only one study (4.7%) followed a qualitative approach.

It was clear from the review that self-regulation mechanisms do not act in isolation. It was therefore important to identify and include themes that were found to influence the impact of self-regulation failure in some way. Therefore, while theme 1, self-regulation limitations or failures, is used to address aim 1; themes 2, 3 and 4 are important for addressing aim 2, that is, to propose a model for further research. Four themes were identified from the review, each with at least two or more sub-themes. It is important to note that themes and subthemes are not exclusive and that some overlap— this will be addressed in the discussion and hypothesised model. Table 2 shows a summary of the themes and subthemes.

**Table 2 – Themes and Subthemes**

<b>Theme 1 Self-regulation Limitations or Failures</b>	<b>Theme 2 Hypersexuality</b>	<b>Theme 3 Social and Contextual factors</b>	<b>Theme 4 Personality Traits</b>
<input type="checkbox"/> Poor emotional regulation <input type="checkbox"/> Impaired self-control <input type="checkbox"/> Poor self-efficacy	<input type="checkbox"/> Sexual motivation and desire <input type="checkbox"/> Sexual preoccupation	<input type="checkbox"/> Gender <input type="checkbox"/> Religion <input type="checkbox"/> Social stressors	<input type="checkbox"/> Neuroticism <input type="checkbox"/> Introversion

### **Theme 1 – Self-regulation Limitations or Failures**

#### **Poor Emotion Regulation**

According to Pettoruso et al. (2020), emotional regulation refers to the ability to modulate ongoing demands of a variety of emotions while exercising consciousness and flexibility of one's current emotions, despite challenges being faced. In a study on mindfulness and sexual outcomes, Pepping et al. (2018) found emotion regulation to be a significant mediating factor. Dispositional mindfulness was associated with increased sexual satisfaction, adaptive sexual functioning, and less problematic pornography use. However, when emotional regulation was included in this relationship, only indirect effects of mindfulness on sexual satisfaction through emotional regulation were observed. This is because individuals with higher levels of dispositional mindfulness are better able to regulate emotion, which may help them respond more adaptively to factors that underly sexual satisfaction, such as self-criticism, anxiety about sexual performance, discomfort with intimacy, and sexual inhibition. Maddock et al. (2019) concur – they found that men who reported more depressive symptoms at the baseline were more likely to use pornography excessively at three months and report more depressive symptoms at six months. It is therefore difficult to establish temporal precedence; however, the finding is consistent with research suggesting that self-perceived excessive use of pornography is related to depression.

Hesse and Floyd (2019) explored the relationship between pornography consumption, affective deprivation, and mental and relational wellness. Their findings indicate that when people experience a lack of affection, they are more likely to consume pornography with the purpose of reducing loneliness and creating a mental escape from their situations. They conclude that pornography consumption may be used as a form of affection substitution, that is, dealing with affection deprivation. Pettoruso et al (2020) indicate that difficulties in emotional regulation could lead to the transition to problematic internet use, including pornography addiction.

Similarly, to Hesse and Floyd (2019), they indicate that pornography addiction could represent a compensatory strategy to regulate one's emotional state and, more specifically, to alleviate dysphoric states. The reason why pornography may be used as compensation for negative affect or dysphoria is perhaps the role that reward plays, specifically in the form of pleasure. Bőthe et al. (2019) found pleasure to be the third strongest motivational factor in problematic pornography usage. Levi et al. (2020) found not only does pleasure to play a key role in reducing feelings of tension in compulsive sexual behaviour, but also that pleasure, because of the associated enjoyment, also contributed to failed attempts of self-regulation.

Although the review consistently showed a correlation between inadequate emotional regulation and problematic pornography use, Harper and Hodgins (2016) found no direct link between the amount and frequency of an individual's pornography use and struggles with anxiety, depression, and life and relationship satisfaction.

### **Impaired Self-control**

Grubbs et al. (2017) define self-control as an important cognitive process in regulating behaviour when it comes to achieving specific goals. Individuals who display lower self-control might experience more challenges in regulating their behaviour or emotions (Grubbs et al., 2015a). Impaired self-control was found to be a significant predictor of problematic use of sexually explicit internet material (Stark et al., 2017). Impaired self-control was specifically evident in studies on impulsivity – Pettoruso et al (2020) found higher levels of impulsivity in individuals with problematic Internet use (PIU), defined as the use of the Internet that includes video gaming, social media, web-streaming, and pornography viewing that causes psychosocial difficulties in a person's life. Levi et al (2020), in the first of the two studies, found impulsivity to be associated with the occurrence of sex-addiction and online pornography usage. High

impulsivity can therefore be said to lead to more risk-taking behaviour, as there is a lack of forethought for the behaviour that will be acted out.

From a neurological perspective, Gola et al. (2017) link impaired self-control to the strong effects of reward. They found that men with problematic pornography use show a higher increased in ventral striatal reactivity to cues predicting erotic pictures compared to cues predicting monetary gains. This increased striatal reactivity for cues predicting erotic content is followed by higher motivation to view erotic rewards, but, as this is characterised by increased ‘wanting’ rather than actual ‘liking’ (p.2027), impaired self-control is strongly suggested.

### **Poor Self-efficacy**

Krause et al. (2017) defined self-efficacy as the belief and confidence in one’s own ability to accomplish a specific goal or task. Self-efficacy can fluctuate between being a stable trait where an individual may always have confidence in achieving a specific goal and an unstable trait that may depend on the context of the specific goal or task. Irrespective of the context, poor self-efficacy may therefore lead to unsuccessful accomplishment of desired goals as well as lower confidence in oneself to achieve a specific goal. In this regard, Krause et al (2017) found that an individual’s confidence to employ specific strategies to reduce their use of pornography was significantly positively correlated with self-efficacy to avoid using pornography. This seems to be true specifically in the case of hypersexuality (see later theme), because one of the underlying characteristics of hypersexuality is difficulty in controlling one’s sexual behaviour (in reference to Kafka, 2010). According to Krause et al (2017), this lends credibility to the ratings of self-efficacy that suggest that scoring higher on hypersexuality was associated with having lower self-efficacy to avoid using pornography when tempted by external or internal cues.

## **Theme 2 – Hypersexuality**

Hypersexuality is not defined by any study in this review; however, collectively, it refers to potentially dysfunctional sexual urges, desires, obsessions or preoccupations (Kafka, 2010). Grubbs et al (2015b) indicate that pornography addiction is a subdomain of hypersexuality. Two subthemes emerged, namely sexual motivation and desire, and sexual preoccupation.

### **Sexual Motivation and Desire**

Stark et al. (2017, p.181) define trait sexual motivation as the “general individual motivation to be sexually active in a long-lasting, trait-like perspective”. They found that sexual motivation can be regarded as a trait that predisposes certain individuals to be more inclined to have failed self-regulation when faced with pornography or sexual triggers and cues. Related to trait sexual motivation, Lopez and George (1995) found a strong link between erotophobia-erotophilia, (“the disposition to respond to sexual cues along a negative-positive dimension of affect and evaluation”, p. 276), and sexual behaviour. Those high on erotophilia (and low on erotophobia) exhibit not only more positive affect when communicating about sexuality, but also greater willingness to expose themselves to erotic pornography.

Parsons et al. (2007) found that circumstances can provoke an individual to act on the experience of sexual urges. In addition, these circumstances can include certain distressing factors within an individual’s biography as well as the context that they find themselves in. Böthe et al. (2019) found that difficulties to control urges to engage in pornography use may involve compulsive and impulsive tendencies. Interestingly, they also found that these urges were not always experienced as “wanted” urges and, additionally, may lead to ego-dystonic viewing in conflict with an individual’s personality and beliefs.

### **Sexual Preoccupation**

Levi et al. (2020) found obsessive thoughts to be a part of a cognitive-emotional experience which includes pervasive thoughts about sex, feelings of guilt, isolation, low self-esteem, as well as a need to avoid some unpleasant thoughts. They also found that individuals who experience intrusive obsessive thoughts experience associated anxiety, tension and a negative mood afterwards that could be accompanied by guilt and shame. It is therefore understandable that compulsive sexual behaviour is aimed at reducing experienced anxiety or tension. Furthermore, the findings by Levi et al. (2020) support the argument that sex addiction lies on the impulsive-compulsive scale and can be classified as a behavioural addiction.

Sexual compulsion refers to the exaggerated expression of sexual behaviours such as compulsive masturbation, excessive use of pornography, sex with multiple partners, excessive use of the Internet for sexual purposes, and disproportionate amounts of time spent thinking about sexual gratification or obsessing about sexual partners (Parsons et al., 2007, p.6). Daneback et al. (2006) found the time spent online for sexual purposes to be a measure of the kind of sexual activity rather than a measure of online sexual compulsivity. This non-linear relationship between the amount of time spent online for sexual purposes and sexual compulsion suggests that time spent online may be an inappropriate measure of online sexual compulsion. Finally, Böthe et al. (2019) found a stronger relationship between impulsivity and hypersexuality than between compulsion and hypersexuality. It is possible, according to these researchers, that both impulsivity and compulsion have stronger effects when it comes to problematic pornography use via mediating variables.

### **Theme 3 – Social and Contextual Factors**

#### **Gender**

Although both gender groups enjoy visual erotic stimulation (Lopez & George, 1995), men were found to have higher problematic or at-risk pornography use (Harper & Hodgins, 2016; Levi et al., 2020; Squirrel, 2011; Stark et al., 2017). Harper and Hodgins (2016) identified single men who were exposed to Internet pornography at an early age and who are addicted to video games to be the most at-risk population for problematic Internet pornography use. While women are less likely to be sexually compulsive (Daneback et al., 2006), men appear to be more motivated to approach sexual stimuli and more easily drawn to sexual stimuli than women (Dewitte, 2016). Interestingly, De Witte (2016) found men to have a better developed inhibitory system in response to sexual stimuli than women. She explains this by hypothesising that, as men more actively seek for such sexual stimulation than women, they have developed a cognitive strategy to gain mental control over their sexual behaviour, thereby preventing inappropriate sexual behaviour and saving important social relationships.

## **Religion**

Religious individuals tend generally to disapprove of pornography use (Grubbs et al., 2015a). Despite the possibility of religion to be a protective factor, religiosity was also found to be associated with unhappiness and depressive tendencies among users of pornography in this group of individuals. Reid et al., (2016) found religious persons to have had a substantially lower frequency of other addictive patterns involving substance abuse and somewhat lower difficulties with stress proneness and anxiety. They do, however, act on sexual impulses equally, but appear to exercise more restraint with relational sex compared to solo-sex behaviours. These researchers found, however, that religion could contribute to either positive or negative outcomes in individuals who experience symptoms of hypersexuality (Reid et al., 2016).

This is corroborated by Grubbs et al (2017), who found that religious self-appraisal of pornography addiction is often exacerbated or maintained by moral principles around pornography use. This is perhaps because, for religious individuals, pornography use represents violation of deeply held beliefs, resulting in dissonance, shame, and distress — similarly to what may be observed in addictive disorders— but this may be due to negative self-views rather than behavioural dysregulation. Finally, Maddock et al (2019) found that religiosity at baseline predicted frequency of pornography use wot be six months later for men, but not for women, suggesting that the frequency of pornography use in men, but not women, is affected by religiosity. In contrast to some other studies, they found religious men to be more likely to use pornography.

### **Social Stressors**

A range of social factors and stressors seems to increase the risk for problematic pornography use. Parson et al. (2007) refer to event-centred and contextual triggers for sexual compulsivity. Event-centred triggers develop suddenly and episodically, leaving the individual feeling overwhelmed and out of control, for example economic misfortune or loss of a loved one. Conversely, contextual triggers refer to daily temptations or events which may make it difficult for the individual to refrain from a specific behaviour and which induce sexually compulsive behaviours. They found that sexual compulsion was often triggered by personal misfortunes or distress. Sex then acts as a distraction from these individuals' realties. Grubbs et al (2015b) found, accordingly, the perceived addiction to Internet pornography to be robustly related to psychological distress indicators. Harper and Hodgins (2016) found Internet pornography addiction to be related to poorer psychosocial functioning and problematic alcohol, cannabis, gambling and, in particular, video game use.

Finally, Hesse and Floyd (2019) found social isolation, and more specifically, those deprived of affection, to be more inclined to use pornography as a substitute for affection. This is supported by Harper and Hodgins (2016), who found that individuals who are not in relationships report more frequent use of internet pornography than those in relationships.

#### **Theme 4 – Personality Traits**

Not much evidence was found on personality traits in the literature – both neuroticism and introversion were only assessed indirectly and are reported here only briefly.

##### **Neuroticism**

Grubbs et al (2015a) found that neuroticism, the tendency toward anxiety, self-doubt, and emotional lability, positively correlated with perceived addiction to pornography. As neuroticism is explored in a model together with religiousness and moral disapproval, the exact role of neuroticism is however not exactly clear from this study.

##### **Introversion**

Pettoruso et al. (2020) found problematic Internet use to be related to lower scores on three personality dimensions, namely novelty seeking, harm avoidance, and reward dependence. Although their results contradict previous research, it supported their hypothesis that higher novelty seeking would be a protective factor against pornography addiction. Given the interaction between these personality traits and high scores on depression and anxiety scales, they argue that the presence of mood and emotional problems in personalities with reduced novelty seeking could predispose individuals to problematic use of the Internet pornography. Formulated differently, individuals who are more introverted might be more at risk of poorly

regulating their emotions, in which cases online pornography might provide an escape from the pressures of reality.

## Discussion

Regarding self-regulation limitations or failures, the findings of the studies are not surprising as self-regulation theory claims that in order to practise effective self-regulation, an individual has to exhibit good emotion regulation (Koole & Aldao, 2017; Sapolsky, 2007; Tice, 2009), good self-control (Baumeister & Tice, 2007; Dick, Smith, Olausson, Mitchell, Leeman & O’Malley, 2010; Gillan & Robbins, 2014; Muusses, Finkenauer, Kerkhof, & Righetti, 2015) and self-efficacy (Bandura, 1977). These skills are general resources that help the individual to manage and cope with a wide variety of situations, and as the review studies show, they are equally important in resisting sexual temptations, specifically as a habit-forming behaviour. The fact that pornography was indicated by several studies as an escape from loneliness (Hesse & Floyd, 2019) or distress (Pettoruso et al., 2020) and thus an effort to cope by engaging in pornography clearly illustrates the importance of emotional regulation. Effective emotional regulation helps the individual to constructively direct their actions in emotion-arousing contexts (Koole & Aldao, 2017). The directing of distress to something physically pleasurable like pornography, even if the intention is short-term anxiety relief, may, if done repetitively (Volkow, 2014), increase tolerance and the risk to become addicted due to neurochemical changes in the brain that decrease distress and anxiety (Botswick & Bucci, 2008). This is perhaps why Pepping et al. (2019) found dispositional mindfulness to be associated with adaptive sexual functioning and less problematic pornography. According to Koole and Aldao(2017), mindfulness prevents

habituation processes as it consists of the ability to reflect on one's own emotive states and, when negative, to respond to it in constructive and adaptive ways.

The importance of self-control and self-efficacy is also no surprise – Maranges and Baumeister (2017, p. 60) define self-control as the “ability to alter one’s thoughts, emotions, and behaviours or to override impulses and habits, [which] allows one to monitor and regulate oneself to meet expectations”. The challenge with pornography is perhaps the strong physical reward and relief of distress it brings, even if brief and temporary. Further, the act itself may seem to be inconspicuous when experiencing distress; therefore, it is possible that individuals may not put in dedicated and strong-willed self-control efforts. In addition, when self-efficacy is low, the individual might not believe that they will be able to resist the temptation. According to Maddux and Volkmann (2017), self-efficacy beliefs are the appraisals of our ability to use our competencies in different contexts. It is possible that people may not be motivated to have self-efficacy regarding inhibiting sexual temptations unless they perceive these temptations as interfering with their daily functioning.

It was clear from the review that the role of *theme 2* (hypersexuality) is primarily that of challenging one’s self-regulation resources. Hypersexuality can be defined as an obsession with thoughts of sexual content, urges, and behaviours that might cause distress and have implications for occupational, interpersonal, and health-related functioning (Dutta & Naphade, 2017). According to Kafka (2010), hypersexuality includes aspects such as urges, pleasure, and curiosity, as the intense preoccupation with sexual fantasies can have an implication for effective self-regulation. Both subthemes identified in this study, namely sexual motivation predisposition and sexual preoccupation, can, if the individual has to continuously attempt to resist sexual temptations or inhibit the associated sexual desires, have the opposite effect due to ego-depletion

(Hagger, Wood, Stiff & Chatzisarantis, 2010). Maranges and Baumeister (2017, p.43) define ego-depletion as “the state of diminished self-control resources, when one cannot or does not successfully implement further self-control”. Therefore, the more the individual has to put effort into regulating urges or needs, etc., the more of the resource is used until it gets totally depleted. In cases like this, the individual would find it difficult to resist even the slightest sexual cues. Thus, even though hypersexuality is not a self-regulation failure in itself, it clearly challenges the individual’s self-regulation resources and should thus be included in the proposed model of pornography addiction.

*Theme 3* (social and contextual factors) was expected, as social context guides behaviour (Blanton & Hall, 2009) and influence self-regulation efforts (Sheeran et al., 2005). What is important is that these social factors seem to play a moderating or mediating role, in contrast to hypersexuality, which challenges self-regulation directly. Gender seems to be a factor, perhaps because men and women have different goal-relevant orientations (Finkel, Fitzsimons & Van Dellen, 2017) and thus respond in different ways to sexual stimuli (Botchkovar & Broidy, 2013). More specifically, it was evident from the review that men are more motivated to approach and be drawn in by sexual stimuli (Dewitte, 2016). Even though men are better able to show mental control over sexual stimuli, according to DeWitte, repeated exposure may induce ego-depletion quicker than in the case of women. Furthermore, the subtheme of religion concurs with literature showing that religion is associated with better self-regulation, as it speaks to the moral compass of individuals (Carter, McCullough, & Carver, 2012; McCullough & Willoughby, 2009). However, other studies indicated that religion might account for the increased anxiety or tension that individuals may experience when attempting to resist an urge or temptation, as the goal could be against their religious views (Harrison & McKay, 2013). This was also found by at least

three studies in this review (Grubbs et al., 2015a; Grubbs et al., 2017; Maddock et al., 2019), clearly implying that religion does not always protect against pornography addiction and that it depends rather on the interaction with other factors.

Finally, although *theme 4* (personality traits) was expected, it is surprising that not more evidence was found. McCrae and Löckenhoff (2010) comprehensively explain the importance of personality traits in the execution of self-regulation – it may influence the goals one chooses, how one applies self-evaluation in the monitoring of goal achievement, as well as if, how and when one decides to apply self-control. The researcher expected to find studies on personality traits like conscientiousness (the extent to which one is self-disciplined and able to apply self-control) specifically; however, the influence of neuroticism and introversion is not surprising. Like social context, personality appears to play a mediating or moderating role – Pettoruso et al. (2020) clearly suggest a moderating effect: individuals with self-regulation challenges and high in introversion (rather than extraversion) might be more prone to use pornography as an escape from distress. There may, however, also be a two-way interaction between personality and self-regulation as introversion may be a risk factor for the development of poor self-regulation mechanisms when confidence in difficult or challenging situations is poor (Kornør & Nordvik 2007).

### **Towards a Hypothetical Model on Self-regulation and Pornography Addiction**

Even though the limited results found regarding factors like delay of gratification (Gawrilow, Gollwitzer & Oettingen, 2011) temptations (Fujita & Carnevale, 2012) and conscientiousness (McCrae & Löckenhoff, 2010) were surprising, the review provided enough provisional evidence to at least propose a hypothetical model of self-regulation and pornography addiction. The model will have three premises: (i) there is an interactional effect between self-regulation

failure and hypersexuality; (ii) social factors mediate or moderate the relationship between self-regulation failure and pornography use and addiction; and (iii) personality has an interactional effect with self-regulation failure, but also a moderating effect on the relationship between self-regulation failure and pornography use and addiction.

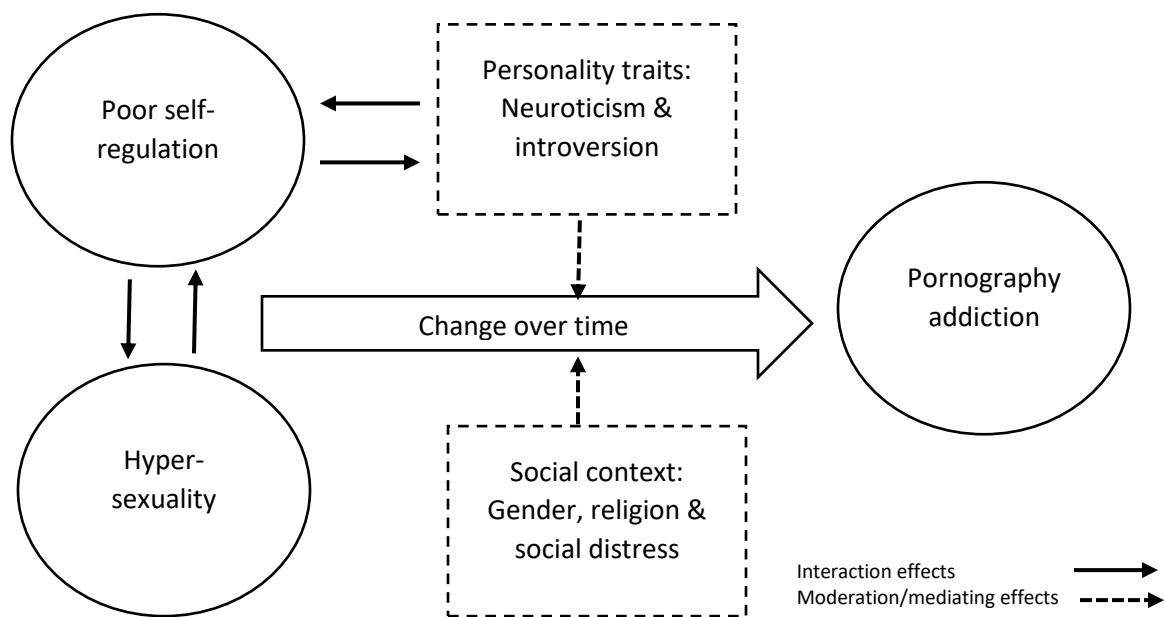
Evidence for *premise 1* (interaction between self-regulation and hypersexuality) is based on the following results from the review: (a) mindfulness and emotional regulation facilitate an adaptive response to sexual needs (Pepping et al., 2018); (b) pleasure plays a key role in reducing feelings of tension in compulsive sexual behaviour but also contributes to failed attempts of self-regulation (Levi et al., 2020); (c) impaired self-control significantly predicts problematic use of sexually explicit internet material (Stark et al., 2017); (d) higher impulsivity is found in individuals with problematic Internet use (PIU) (Pettoruso et al., 2020); and (e) hypersexuality is associated with having lower self-efficacy to avoid using pornography when tempted by external or internal cues (Krause et al., 2017).

Evidence for *premise 2* (social factors mediate or moderate the relationship between self-regulation failure and pornography use and addiction) is implied in the following findings: (a) when people experience a lack of affection, they are more likely to consume pornography to reduce loneliness (Hesse and Floyd, 2019); (b) distressing circumstances can provoke an individual to act on sexual urges (Parsons et al., 2007); (c) there is strong evidence that both impulsivity and compulsivity have stronger effects on pornography use via mediating variables (Böthe et al., 2019); (d) men have higher problematic pornography use (Harper & Hodgins, 2016; Levi et al., 2020; Squirrel, 2011; Stark et al., 2017) and are more motivated to approach or are more easily drawn to sexual stimuli (Dewitte, 2016); (e) religion could either contribute to positive or negative outcomes for individuals who experience symptoms of hypersexuality (Reid

et al., 2016); (f) pornography use among men, but not women, is affected by religiosity (Maddock et al., 2019).

Evidence for *premise 3* (personality has an interactional effect with self-regulation failure, but also a moderating effect on the relationship between self-regulation failure and pornography use and addiction) was found in that (a) neuroticism correlated with the perceived addiction to pornography (Grubbs et al., 2015a); (b) problematic Internet use is related to lower scores on three personality dimensions, namely novelty seeking, harm avoidance, and reward dependence (Pettoruso et al., 2020); and (b) individuals with self-regulation challenges and high in introversion might be more prone to use pornography as an escape from distress (Pettoruso et al., 2020).

Visually, the model can be depicted as follow (figure 1):



**Figure 1.** Hypothetical model for self-regulation failure.

Briefly then, the model suggests that in some individuals, poor self-regulation and hypersexuality enhance and maintain each other through a reciprocal process of interaction. At the same time, poor self-regulation may be enhanced and maintained by those individuals high in neuroticism and introversion traits. The outcome of this interaction between poor self-regulation and hypersexuality is then moderated or mediated by strength of neuroticism and introversion, as well as social factors like gender (men more prone), religion (depends on each individual's context) and exposure to or strength of social distress, resulting in either pornography addiction or not. The important message here is that this model is hypothetical and merely provides a point of departure for further research.

### **Limitations of the study**

Before a final conclusion is made, it is important to take some limitations into account. Although the researchers followed a strict regime to ensure that the rigorous guidelines of systematic reviews were applied, it should be remembered that this is a critical review. Therefore, only certain types of studies and only those published in English were included in the search – some important studies may therefore have been missed. The aim was however not to *determine* the self-regulation factors involved in pornography addiction, but rather to *critically review* existing research in order to *identify* possible factors that may play a role and to propose a model that could benefit future researchers. The findings and the proposed model should therefore not be used to generalise any specific populations nor for clinical purposes.

## **Conclusion**

The aim of the study was to critically review and synthesise the scientific literature for evidence about the mechanisms of self-regulation failure and pornography addiction in adulthood. From the review, three types of self-regulation failures emerged, namely poor emotion regulation, impaired self-control, and poor self-efficacy. It was however also noted that these failures co-exist with factors like hypersexuality, neuroticism, and introversion, as well as social factors like gender, religion, and social distress. A second aim was to propose a hypothetical model for self-regulation failure and pornography addiction in adulthood based on a critical reflection of the results gained. A model was proposed on three premises indicating the dynamic relation between self-regulation failure and other factors; in short, interacting effects seem to exist with hyper-sexuality, neuroticism, and introversion, while these same personality traits also seem, together with social factors, to mediate or moderate the relationship between self-regulation failure and eventual outcome regarding pornography addiction.

It is strongly recommended that more research be done to fully understand the complex nature of pornography addiction and especially how it relates to self-regulation and other contextual factors. One way to do this would perhaps be to evaluate the proposed model to ensure whether it is confirmed by statistical significance and determine which refinements may be required before it can be used as a guideline for clinical practice.

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## CHAPTER 3: CRITICAL REFLECTION

Chapter 3 provides a reflection on the research process conducted by the writer.

Since my psychology journey started, I always wondered about regulation or self-control. I wanted to comprehend how some individuals can successfully regulate themselves and other's not. Self-regulation seemed to be utilized in one's basic daily activities including eating, planning, reaching certain goals, driving etc. Furthermore, I thought about the level of self-regulation within highly trained groups such as the Military soldiers and the SAPD. I remembered my father telling me stories about his experience within his basic training while becoming a soldier in South-Africa. As I understood, their level of self-regulation needed to be quite elevated, in order to survive the Border war, also known as the Bushwar since 1966 until 1989. I therefore wanted to explore how they were able to incorporate self-regulation to such high levels. However, little scientific studies regarding South-African Border war and military training was found.

My research supervisor, and I therefore thought about more prevalent and recent topics. Currently, our lives seem to depend and, in some way, ruled by computers, technology in general and smartphones. Technology has become part and parcel of our lives to such an extent that misplacing your smartphone or laptop disrupts your whole day- as your contact lists, reminders, alarms etc. were saved on it.

The theme of pornography came up as one of the topics that seemed to be a concern especially within adolescents and since the technology era has started, the access to pornography became much easier and convenient. My concern relied on the type of exposure and perspectives

that resulted from viewing explicit material that might be more harmful even though it could be out of plain curiosity or even educational. Therefore, the viewing of pornography itself was not the concern but more the type of material and the possible distorted cognitions regarding sexual intercourse, consent to sexual intercourse and poor self-esteem that might develop if debriefing is not done.

I guess in some way, that I am ‘old school’ and I somewhat frowned upon the idea of easy access to sexually explicit material as in my view and opinion it at times created an idealistic, almost unreal world where certain sexual activities, sometimes without consent were explored. I also had a negative view regarding pornographic sites as child pornography became more accessible. Furthermore, it seemed to be a general secretive activity mostly used among males (as research has indicated) which was expected, as stereotypical views of men indicated that ‘all men at some point in their lives, viewed pornography’. Therefore, I struggled to accept this stereotype as some of these individuals become addicted as viewing sexually explicit material helps them to ‘blow off steam’, relax or creates a space for their shadow self or even just to get the time by. Despite my personal opinion and views I realized that this topic would challenge my views and I therefore decided to choose this specific topic to be more objective and cognisant of scientific literature regarding the topic.

While doing my literature review, I grasped that pornography addiction sometimes destroyed relationships, marriages, families, cognitions and self-concepts. I therefore understood that viewing pornography could be part of a coping mechanism or possibly due to a self-soothing mechanism in order to deal with daily challenges and urges. However, much like any other addiction such as cocaine addiction, alcohol etc., self-regulation seemed to be ineffective and at times left the viewer with instant gratification, guilt, shame and distorted views of the self.

Moreover, I thought that if one can understand the mechanisms behind self-regulation failure and the impact on the development of addiction in general, possible intervention strategies could be explored and incorporated within clinical settings. Therefore, installing healthier coping mechanisms that would not negatively implicate individual's occupation, social networking, and interpersonal relationships.

Throughout this process within 2020, one of the biggest challenges was the COVID-19 pandemic and how it influenced communication and meetings regarding the research. In addition, this also affected my timeline to submit my study earlier.

I have been surprised by the process of research, and how it assisted me in changing my thought processes into a more clinical and critical perspective.

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