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AN INVESTIGATION INTO THE COMPLEX WORLD OF AVERSIVE FANTASIES

Section A: A narrative review of violent fantasies and their associated cognitive and psychosocial factors.

Word Count: 7997 (229)

Section B: The benefit of pain? A quantitative investigation into the associated factors of aversive fantasies in maladaptive daydreaming.

Word Count: 7996 (109)

Overall Word Count: 15993 (338)

A thesis submitted in partial fulfilment of the requirements of
Canterbury Christ Church University for the degree of
Doctor of Clinical Psychology

APRIL 2024

SALOMONS INSTITUTE FOR APPLIED PSYCHOLOGY
CANTERBURY CHRIST CHURCH UNIVERSITY

Acknowledgements

I would like to thank all the participants who took the time to be an integral part of this study. A special thanks to our expert by experience, Maïssam, for her assistance in shaping this project.

I would also like to extend my gratitude to both of my supervisors – Dr John McGowan and Dr Amy Lucas - for their guidance and support throughout my project.

Finally, a big thank you to my family and friends for their encouragement on my journey to become a clinical psychologist - and my wife, without whom I wouldn't be who I am today.

Summary of Major Research Project

Section A: Violent fantasy (VF) has been considered a risk factor for aggressive behaviours over the past decade. This narrative synthesis aimed to summarise how VF is understood, its role as a risk factor for aggressive behaviours and its association with cognition and psychological well-being. Fourteen papers were identified through a systematic search, reviewed, quality assessed, and summarised. VF was defined as mental images of violence, involving hurting others or oneself and functioned as a cognitive rehearsal to cope with distress. Measurements of VF were inconsistent, and VF alone might not be the best indicator of violence. The relationship between psychological distress and social isolation suggested important areas for consideration.

Section B: Aversive fantasies in maladaptive daydreaming (MD-AF) were reported to allow people with MD to seek pleasure through dark and emotionally painful daydreams. However, associated factors remain speculative. This study explored the roles of behavioural avoidance of anger, benign masochism, and psychological pain in MD-AF. Results suggested that emotional dysregulation was associated with MD-AF, and behavioural avoidance of anger might be an emotional regulation strategy for people with MD-AF. Psychological pain mediated the relationship between trauma exposure and MD-AF. The psychological impact of MD-AF was discussed.

Content

List of tables and figures

Part A

Part B

List of Appendices

Section A: Literature Review

A narrative review of violent fantasies and its associated cognitive and psychosocial factors.

Word count: 7997 words (191 words)

Abstract

Objective: The presence of violent fantasy (VF) has been seen as one of the risk factors for aggression in the past decades. This study aimed to summarise how VF is understood and related to its associated factors.

Method: A systematic search was conducted on three electronic databases in October 2023. Fourteen quantitative papers were critically appraised with three quality assessment tools. Narrative synthesis was used to summarise definitions and measurements of VF, and findings of the studies included.

Results: The definition of VF was illustrated by two themes (textual descriptions and functions). The findings were summarised into three themes: (risk of aggression, cognitive correlates and overlaps, and impact on psychological well-being) and six sub-themes (exposure to violence, beliefs about aggression, rumination and other cognitive correlates, suicidality and social isolation)

Conclusions: VF is considered a cognitive rehearsal of mental images about hurting others or oneself, to escape from stressful situations. VF might not be the best indicator of aggression. The heterogeneity of measures and conceptual overlapping with cognitive functions suggested that VF remains poorly understood. The correlates of VF with psychological distress suggested a need for further investigation into vivid and continuous fantasies.

Keywords: **violent fantasies, aggression, psychopathology, suicide, rumination**

Introduction

Violent fantasy (VF) can loosely be considered a form of continuous and vivid mental imagery created by an individual who is violent or aggressive. It might be associated with hurting self or others or being hurt (e.g. Egan & Campbell, 2009) and is unconstrained by reality (McCreery & Krach, 2018) in that the content of these fantasies is not limited by social norms or any law of physics (Klinger, 2009). In research over the last two decades, VF has actively been considered a risk factor for future aggression (Elbogen et al., 2002; Meloy et al., 2004), as the presence of these fantasies was reported frequently in individuals who were convicted of crimes associated with inflicting bodily harm to others. Correlational studies have provided evidence to support the association between VF and aggression in children and adults (Nagtegaal et al., 2006). Studies (e.g. Watt et al., 2013) have largely been successful in incorporating different models of aggression such as the Social-cognitive Model of aggression (Huesmann, 1988) and the General Aggression Model (Anderson & Bushman, 2002) to explain the function of VF as a mental rehearsal to normalise aggressive acts and form an aggressive script to inform actions and behaviours in real life. Yet, the experience of VF did not necessarily predate a high level of aggression and aggressive behaviours (Smith et al., 2009). Also, there were some variations in terms of how VF was understood and measured. Moreover, VF was often associated with other variables such as personality, psychopathological factors, and other behaviours. Therefore, a more in-depth investigation of the VF was warranted.

Conceptual Evolution of Fantasy

Fantasy is defined as the process of *"imagining a complex object or event in concrete symbols or images, whether or not the object or event exists; or the symbols or images themselves*." (English and English, 1958; p.203). Although this definition of fantasy was implied as a mental process which individuals engage in to depart from reality, fantasies

could exist in different forms such as novels and movies, and are not limited to mental processing (Klinger, 2009). The current review focused on the internal mental processing of fantasies, which Klinger (2009) considered as "fanciful thought" in daydreams.

Due to the intrinsic nature of how fantasies might present in different forms, it was not difficult to understand how research had adopted a somewhat problematic view of fantasies, particularly interchanging it with other similar psychological processes such as daydreaming and imagination. In contemporary psychoanalytic theories, Freud considered that fantasies or *phantasies* existed to fulfil one's frustrated wishes and were an "unconscious process" (Spillius, 2001). He suggested that fantasy is a suppressed internal process that would first emerge in the forms of "*conscious*" or "*preconscious*" daydreams that were far from materialistic reality (Freud, 1908, as cited in Spillius, 2001). In Singer's (1975) pioneering work on exploring the mechanism of daydreaming activities, he regarded daydreaming as a mental activity that represents a mind drifting away from ongoing activities and vivid, fantastical mental imagery could be part of it. Similarly, Klinger (2009) considered fantasy and daydreaming as similar but distinct processes, that "fanciful thought" is a shared element between these two constructs. In other words, fantasy can be seen as one type of daydreaming experience. Klinger (1971) also proposed two distinctive features in fantasies, in that the content of the fantasy can be influenced by (1) concerns in one's daily life, and (2) one's internal self (e.g. cognition, experiences and values). However, a later review suggested that Klinger's proposed understanding of fantasies might not encapsulate all fantasy experiences as it was strongly influenced by Western narratives (Dissanayake, 1974).

Zelin et al. (1983) explored the construct of sustaining fantasy. They proposed that sustaining fantasies are somewhat different to daydreams in that the experience and content were often more perpetual and vivid in imagery. They considered that individuals consciously engage in sustaining fantasies as a coping mechanism for the emotionally

"painful" state that they are going through, by immersing themselves in a more ideal state that can be either positive or negative. More recent research on the notion of continuous fantasies has led to the discovery of a daydreaming state, such as immersive daydreaming (Bigelsen & Schupak, 2011) whereby individuals would actively immerse themselves in a self-constructed, vivid and affective-laden fantastical plot when they daydream. Maladaptive daydreaming (MD) was then considered as the maladaptive form of immersive daydreaming that individuals would start to lose control of their daydreaming behaviours, causing a considerable amount of distress to their daily lives and occupational functioning (Somer, 2002, 2016a; Schimmenti et al., 2019).

The exploration of sustaining fantasies and MD helped put the idea of fantasies into the context of a continuum, whereby fantasies can exist as fanciful thoughts in a transient form that is spontaneous and unrelated to ongoing tasks (Klinger, 1971; Singer, 1975) to a more perpetual form where the fantasies were seen as more continuous with an adaptive purpose to cope with a painful state (Zelin et al., 1983), and to a compulsive and excessive form with fantasies that were more vivid and could "replace human interactions" (P.427; Zelin et al., 1983), causing a considerable amount of distress to individuals' psychosocial wellbeing.

The Emerging Attention Given to Violent Fantasy

Fantasy was originally considered to be a wish-fulfilment activity that usually carries a positive connotation. Yet, it was not unusual to see fantasies being reported in aversive forms (e.g. violence, aggression suffering etc; Egan & Campbell, 2009). It is worth acknowledging that in the current evidence base, both aggressive fantasies (AF) and violent fantasies (VF) were used to describe this subtype of fantasy experience. Allen and Anderson (2017) suggested that violence and aggression should be understood on a continuum based on the severity of the act - that is while not all aggressive acts are violent, all violent acts are

considered as aggressive. Therefore, the current review opted to use the term "violent fantasies" as the main focus while also acknowledging that AF could also help inform and support the understanding of VF. In Hickey's work (2015) which explored the underpinnings of serial murders, he based his argument on previous research (Prentky et al., 1986; Ressler et al., 1988) regarding the relationship between murders and fantasies and suggested that VF was the one of the factors often presented in cases of serial murders. Indeed, studies in the past explored the psychological profiles of offenders retrospectively and found that VF was often presented (Meloy et al., 2004).

Given this acknowledged association between VF and aggression, researchers have attempted to apply existing models of aggression to understand the relationship between VF and aggression, such as the information processing model for aggression, proposed originally by Huesmann (1988). The model suggested that the script was a cognitive variable that was stored as a set of guidelines that influence how an individual anticipates and responds to daily life events. These scripts were thought to have been acquired by an individual in their early childhood when they witnessed the benefit of using violence as a reaction to different events and therefore was encoded in their memory (Huesmann, 1988). Later research considered the process of individual fantasising about violence as a form of encoding aggressive script, that the more frequently the individuals access their internal fantasies about violence or aggression, the more the beliefs about aggression will be normalised (e.g. Grisso et al., 2000; Nagtegaal et al., 2006; Sheldon & Patel, 2009). In such a way, the aggressive scripts will become more easily accessible when the individuals face triggering events in their daily lives. Studies have also suggested the planning nature of VF that when individuals fantasised about their future acts of aggression, it would be easier to turn them into actions as the consequences were desensitised through their mental processing (Nagtegaal et al., 2006). In a recent literature review (Gilbert & Daffern, 2017), researchers argued that the current body of

literature that pertained to exploring VF was theoretically looking at aggressive script rehearsal. This was due to a few conceptual differences in that there were many overlapping functions between scripts and fantasy; and VF was sometimes ill-defined which made it difficult to create clear distinctions with other similar constructs (Gilbert & Daffern, 2017). While the script theory was helpful in understanding the relationship between VF and aggression, would the rehearsal function of VF be more aligned with the proposition that daydreams were essentially a form of creative rehearsal (Person, 1996)? The varied ways of defining VF made it difficult for the evidence base to generate a generalised understanding of VF. Therefore, a more in-depth investigation into how VF was being defined and operationalised was warranted.

Violent Fantasies and their Associated Factors

A previous study suggested that there was inconclusive evidence to support the relationship between VF and dangerous or aggressive behaviours (Gellerman & Suddath, 2005). Later researchers began to explore the associated psychological and behavioural outcomes for individuals who had spent time immersing themselves in mental images or thoughts about violence or harming others, in addition to aggression (Gilbert & Daffern, 2017). In studies that pertained to exploring the relationship between VF and physical aggressions (Smith et al., 2009), VF appeared to be correlated with multiple cognitive, psychosocial, and behavioural factors but did not necessarily lead to the outcome of aggressive behaviours. Also, when exploring the impact of violent daydreaming in depressed individuals, Selby and colleagues (2007) found that fantasising about violence in ways of harming oneself was positively associated with the subsequent level of suicidality. Moreover, in research that pertained to exploring the construct of sustaining fantasies (Greenwald, 1991; Greenwald & Harder, 1994; Greenwald & Harder, 1995), it was found that the use of negatively themed sustaining fantasies (i.e. themes related to power, revenge, death or illness

and withdrawal) was positively correlated to a higher level of psychological distress such as depression and anxiety. Similarly, Sheldon and Patel (2009) in their qualitative study on male patients in a forensic psychiatric unit also found that VF could be used to regulate emotions, as it helped the individuals to regain control after feeling threatened or humiliated. However, further evidence on the psychosocial and behavioural correlates of VF is lacking, particularly those that could expand our understanding beyond aggression.

Aims of the Current Review

This current review aimed at providing a more comprehensive understanding of how VF are being understood in the current literature, through conducting a narrative synthesis based on a systematic search. Moreover, given that aggression was not the singular outcome of having VF, it was also the aim of the current project to expand the synthesis to literature outside of aggression by summarising currently known outcomes that might be associated with the experience of VF across the lifespan. It focused on the following questions:

1. How is VF currently understood in the literature?
2. What are the associated factors to violent fantasies, in addition to aggression?

Method

To answer the above questions, a systematic search and selection was conducted to summarise relevant articles. Due to the variability of the definition of VF and its measurement tools, narrative synthesis was used as the method to summarise, critique, and present the key findings before discussing the research and clinical implications.

Strategy

An electronic search was conducted across three databases (Medline, PsycINFO, and Embase) on 23rd October 2023. The following search terms were used in the search: (violent daydream* OR violent fantas* OR aggressive daydream* OR aggressive fantas*) and (mood OR well-being OR depression OR anxiety OR aggression OR suicide OR psychopathology). There were no limits to the date of publication applied.

The studies' title and abstract were screened based on the inclusion and exclusion criteria below (Table 1):

Table 1.

Inclusion and Exclusion criteria

Inclusion criteria	Exclusions criteria
- Studies that described and measured violent (or aggressive) fantasy or daydreaming as an internal process. This was done to control the possible confusion around the definition of the construct. - Studies that looked at variables associated with VF. - Only papers of the studies written in English, due to insufficient funding for translation. - Empirical studies (qualitative or quantitative) - Studies that included young children and adolescents. This was decided because the formation of fantasies or "scripts" might take place in early childhood and with the aim to explore the directional effect of VF on other variables.	- Studies that looked at fantasies in general with no specific focus on aggressive or violent fantasies; or measured VF through external means (e.g. play-acting; video games) - Papers that looked at sex related aggressive fantasies. While this project acknowledged that sex related themes were frequently documented in literature pertaining to exploring aggressive fantasies, it would require a larger and separate study to allow enough discussion to be done for sexual related fantasies. - Studies that investigated the effects of treatment.

The search identified a total of 153 studies (refer to Figure 1 for the Preferred reporting items for systematic reviews and meta-analyses diagram (PRISMA); Page et al. 2021). An initial screening was performed on the titles and abstracts of the studies. To confirm further eligibility, the full text of the remaining articles was obtained and reviewed. A total of 10 studies were identified to be eligible for this review. A detailed search of the reference lists of the included papers and a Google Scholar search (first five pages) was also conducted, which helped identify four more studies for the review. A summarised table of the eligible studies was included in Table 2.

Figure 1.

PRISMA Diagram for the Systematic Search

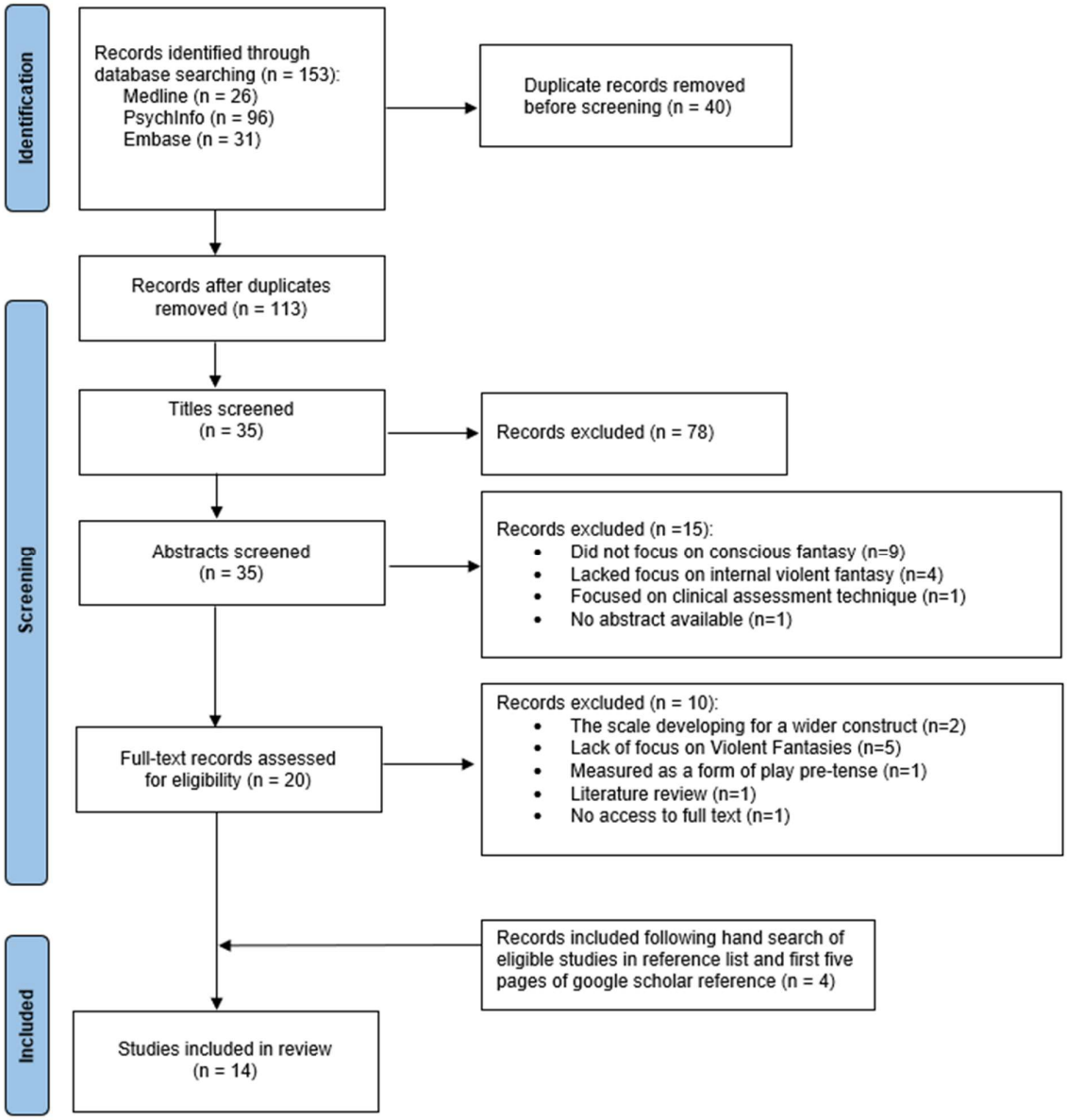

Table 2.

Tabulated Summary of Included Studies

Study	Objectives	Study Design & Methodology	Sample	VF Measures	Key Findings
Chu et al., 2018 USA	Evaluate the association between violent daydreaming (VD; used interchangeably with violent fantasy) and suicidal ideation (SI), and whether this association could be explained by an increase in thwarted belongingness (TB) and perceived burdensome (PB).	Cross-sectional approach Data was drawn from two other studies which used the same self-report measures and were conducted two years apart. Online self-reported questionnaire.	Undergraduate psychology students **Study 1** - 508 participants Mean age = 18.9 Female = 67% **Study 2** - 310 participants with previous suicidal ideation (participants responded to a binary yes/no questionnaire) Mean age = 19.9 Female = 79.1%	ARS Thought of revenge subscale was used to measure VF	People who engage in VD was associated with a higher level of SI, regardless of history of SI. VD was associated with a higher level of TB and PB, which were associated with a higher level of SI regardless of age, gender, subjective level of depression and history of SI. VD was not significant mediator between TB, PB and SI Depression score mediated the relationship between VD and SI, only in participants without a history of SI. Limitation: - relied on online self-reported measures which may subject to response bias. - Sample included primarily female. - Effect sizes were small.
Chu et al.	Evaluate if the	Cross-sectional	512 participants	ARS	People with SI was associated with a

2016 USA	positive association between suicide ideation (SI) and everyday memory deficit could be explained by an increase in violent daydreaming (VD; used interchangeably with violent fantasy)	approach Online self-reported questionnaire.	undergraduate psychology students Mean age = 18.94 Female = 64.3%	Thought of revenge subscale was used to measure VD. SIV First question was used as a proxy for violent daydreaming.	higher level of VD, which was associated with a higher level of memory deficit. VD might impact memory encoding and retrieval in people with SI. Limitation: - Self-reported measures on memory deficits. - Specific measure for VF was unavailable. - Sample was primarily female. - Effect sizes were small.
McCreery & Kathleen-Krach, 2018 Online	Investigation on the relationship between aggressive fantasy, aggression and personality traits in users of social media	Cross-sectional approach Online self-reported questionnaire	106 adults recruited online via social media platforms. Mean age= 25 Female = 46.2%	SAF Measuring frequency of VF	Aggressive fantasies were positively associated with proactive and reactive aggression. Personality variables (agreeableness, emotional stability, and intellect) were negatively associated with aggressive fantasies. Limitation: - Correlational in nature. - Relied on self-reported measures. - No details on how to ensure the validity of the data and managing response biases.

Nagtegaal et al. 2006 Netherlands	Investigating the relationship among aggressive fantasies, thought control strategies and aggressive behaviours	Cross-Sectional approach Self-reported questionnaire	72 Female undergraduate psychology students Mean age= 19.8	SIV-NL (9 items) Translated version of SIV Two questions were used to group people with violent images (i.e. presence of violent fantasies and recency of the experience; < 2 months)	People with or without aggressive fantasies did not differ significantly in terms of age and ethnicity. Aggressive fantasy (AF) was positively correlated with aggression. AF was no longer significantly associated with aggression when thought control strategies were considered (thought suppression +ve associated with aggression; distraction -ve associated with aggression) Limitations: - The study did not provide any justification to recruit from a university sample. - Potential conceptual overlapping between thought control strategies (e.g. re-appraisal and aggressive fantasies). Issues with collinearity was not reported. - No power calculation was reported.
Selby et al., 2007 USA	Exploring the association between violent daydreaming (interchanging	Cross-sectional approach Self-reported questionnaire	83 Undergraduate psychology students Mean age = 19.2	ARS Thought revenge subscale	Violent daydreaming was positively associated with suicidality. A higher level of depression and violent daydreaming about suicide was associated

	with violent fantasies) on suicidality, and if a higher level of depression moderates such relationship.		Female = 78.4%		with a higher level of suicidality. Limitations: - Data was only extracted on one time-point, which make it difficult to determine directionality. - Lacking power calculation; female being the majority in the sample. Sample also consisted of primarily white participants. - No justification in the sampling method, which might not accurately reflect the aim of the research questions.
Smith et al., 2009 USA	Exploring the cognitive and situational factors (exposure to violence, gender, fantasy absorption and dysphoric fantasies) which interact with aggressive fantasies on the outcome of aggression.	Cross-sectional Approach In-home interview and questionnaire Data were extracted from a wider research project to identify antecedents to aggression in the community.	440 Mother-child dyad from the community Mean age of children = 10.4 Female = 45%	CFI Absorption, aggressive and dysphoric subscales were used after conducting a factor analysis.	Aggressive fantasy (AF) was positively associated with aggression, only when the children was previously exposed to moderate to high level of violence in the community. Children who were more absorbed in their fantasies were presented with a higher level of aggression, though it was not limited to AF. Children who engaged in a high level of AF and dysphoric fantasy were associated with a lower level of aggression. Limitation: - Unable to determine directionality

					due to data only being extracted at one time point. - The discrepancy between AF and dysphoric fantasy remained speculative
Watt Begelhole & Guse, 2010 Australia	Investigating the presence of violent thoughts and violent fantasies (VF) are associated with a higher level of violence, in addition to other risk factors (i.e. exposure to violence, childhood antisocial behaviours and alcohol use)	Cross-sectional approach Self-reported Questionnaire	151 adult participants from the community Median age range = 36 to 40 Female = 54.3%	SIV (8 items) Sum of all seven items	In addition to gender, age, victimisation, alcohol misuse, and childhood conduct behaviour, only a high level of justification for violence behaviour were positively associated with physical aggression (VF was marginally significant $p < .07$), when the two factors were added as the same block in the regression analysis. Limitation: - No power calculation and less stringent alpha level, which could result in type 1 error.
Watt & Allard, 2010 Australia	Investigating if the relationship between childhood violence victimisation and aggression in adulthood	Cross sectional approach Questionnaire	250 adults recruited from the community. Median age range = 41-45 Female = 55.2%	SIV (12 items) Four items were added to SIV but only seven items (2-4, 7-10) were	VF was positively associated with physical aggression. The relationship between victimisation and physical aggressions were partially explained by a higher level of VF and justification towards violence.

	could be explained by higher levels of violent fantasies and permissive attitudes towards violence.			added for calculation	Lower level of VF was presented in female. Limitation: - Strengths of the indirect effect pathways of the mediating model was not reported. - Did not consider the impact of ethnicity on SIV. - Did not provide further details on the additional items in SIV.
Watt et al., 2013 Australia	Investigating if harmful alcohol consumption and the presence of violent fantasy was associated with aggression, in addition to the impact of age, gender and social desirability.	Cross-sectional approach Questionnaire	279 adults recruited from the community in Southeast Queensland. Age range = 18-61; 20% participants with age in 18-25 range. Female = 54%	SIV (8 items) Results were dichotomised to those who reported VF and who did not. (Q1)	Individuals who engage in harmful alcohol assumption and have experienced VF was associated with a higher level of aggression, controlling for the impact of age and gender. Social desirability was a stronger predictor of aggression than the combination of alcohol consumption and VF. Limitation: - Did not measure the severity or intensity of VF. - Dichotomisation parameters were different to previous studies. - No power calculation was conducted. - Further demographic information was lacking.

Cohort Study

Study	Objectives	Study Design & Methodology	Sample	VF Measures	Key Findings
Hardin et al., 2022 USA	Investigating the correlation between imagined violence and anger rumination; and whether the role of anger rumination in the relationship between anger proclivity and aggressive behaviours pre/ post hospitalisation was dependent on the presence of imaged violence.	Cohort Study Dataset was extracted from MVRS study. Baseline questionnaire was administered at baseline (whilst hospitalised) Follow up interview was conducted five times year at a 10-week interval post discharge.	1136 adult participants who were hospitalised due to mental health difficulties. Mean age = 29.74 Female = 42.7%	SIV Questions regarding presence of VF and its recency were used to dichotomise participants into with or without VF (SIV+/SIV-)	All areas of AF except the chronicity (i.e. when AF started) were positively correlated with anger rumination. However, their inter-correlation could suggest conceptual overlapping. The role of anger rumination in the relationship between anger proclivity and aggressive behaviours pre/ post hospitalisation was not dependent on the presence of imaged violence, with demographic variables (age, gender, ethnicity) controlled. Limitations: - Measurement of anger rumination was derived from another scale used in the original MVRS study. Validity could not be indicated. - Inter-correlation between AF and anger rumination could suggest conceptual overlapping. - Severity of psychological distress was not considered as a potential confounding variable.
Guerra et	Investigating	Cohort study	4458 pre-school	CFI	Exposure to violence was associated with

al., 2003 USA	the relationship between violent exposure in the community and subsequent violent acts in school children, and if the relationship could be explained by aggressive cognitions (aggressive fantasy and normalised believe about aggression)	Self-reported questionnaire and structured interview with teachers and family	children and their mothers, friends or teachers from low socio-economic area. Age range = 5-12 Female = 49.6%	Aggressive subscale was used.	an increase in aggressive conditions. The effect of violent exposure on aggressive fantasies was stronger in male participants. The association between exposure to violence and subsequent level of aggression could be explained only by normalised believes about aggression but not aggressive fantasies in students from grade 4 to 6. The increase in exposure to violence post aggressive fantasies was only found in male. Limitation: - Concern around type I error on the indirect effect of aggressive fantasy with marginal significance value. - Demographic profile of the sample might limit the generalisability of the findings. Internal consistency of the CFI subscale was moderate.

Case Control Studies

Study	Objectives	Study Design & Methodology	Sample	VF Measures	Key Findings
Grisso et al., 2000	Comparing the prevalence of	Case-control design	1136 adult participants who	SIV (8 items)	During admission, one third of participants with mental health difficulties

USA	imagined violence (used interchangeably with violent fantasy) between individuals hospitalised due to mental health difficulties and healthy controls. Investigating the relationship between violent thoughts reported whilst in hospital and violent acts after being discharged from the hospital.	Baseline questionnaire was administered at baseline (whilst hospitalised) Follow up interview was conducted five times year at a 10-week interval post discharge. (Follow-up interview was only conducted once for healthy control)	were hospitalised due to mental health difficulties. Age range=18-40 Female= 41.3% at baseline 519 adult community sample recruited to match with the case group.	First (presence of violent thoughts) and second (recency- < 2 months) questions were used to dichotomise people with or without imagined violence.	reported thoughts of violence towards others. This was two times more than the control group in the community. The positive association between violent thoughts reported whilst in admission and future violent acts were only found in non-white patients who were experiencing medium to high symptom severity. Limitation: - Generalisability of the data was limited as the comparison between group was limited to a particular demographic group. - No reliability measurement was reported for the target outcome measures. Possibility of other factors influencing violent behaviours post discharge from hospital.
Moeller et al., 2016 Denmark	Comparing the differences in the level of psychological distress, prospective and retrospective physical aggression	Case-control design Self-reported questionnaire - administered at two time points (baseline and follow-up) with five months to compare rate of violent acts.	54 Male inpatient in forensic services Mean age = 36.4	SIV (8 items) First three questions were used to group people with violent images (i.e. presence	Compared to other male without violent images, male forensic inpatients with violent images of hurting others were experiencing a higher level of psychopathological distress (e.g .depression, anxiety, anger) In 60% of times, people with violent thoughts about hurting others were

	among male inpatients in forensic services with or without violent images of hurting others (interchanging with violent fantasies)			of violent fantasies, and the frequency and recency of the experience)	associated with high number of aggressive acts when observed retrospectively. Prospectively, people with violent thoughts have higher risk of performing aggressive behaviours. Limitation: - Study focused on male sample which might subject to gender bias. - No power calculation was reported. Limited understanding of fantasy experiences as only three questions were used.
Poon & Wong, 2021 USA	Exploring if aggressive fantasies would be associated with a higher level of rumination, which would then be associated with a lower level of subjective well-being	Case-control design Experiment: Participants were asked to recall a despised target and were then asked to fantasise either an aggressive or a neutral action towards them Self-reported questionnaire	113 adults based in the USA recruited online. Mean age= 36.27 Female= 65.49%	seven-item self-developed scale to measure the effectiveness of experimental manipulations and check if participants were able to envision the actions according to the conditions	Aggressive fantasies were negatively associated with subjective well-being. Rumination positively mediated the negative relationship between aggressive fantasies and subjective well-being. Limitations: - Lack of demographic information of participants in addition to age and gender. - Given the potential conceptual overlapping between AF and rumination, no information regarding the multicollinearity was

		(aggressive vs neutral)	reported. - A partially mediated effect of the regression model was also ignored (AF remained significantly and negatively associated subjective wellbeing). - Self-reported measure on experimental manipulation and state rumination, which would incur response biases.

Note. ARS - Anger Rumination Scale (Sukhodolsky et al., 2001) ; CFI - Children's Fantasy Inventory (Rosenfeld et al., 1982); SAF- Scale of Aggressive Fantasies (Dahlberg et al., 2005); SFQ - The Sustaining Fantasies Questionnaire (Zelin et al., 1983); SIV - Schedule of Imagined Violence (Grisso et al., 2000); SIV-NL - Schedule of Imagined Violence Dutch Version (Grisso et al., 2000; Nagtegaal et al., 2006).

Synthesis Process

Given the heterogeneity in the measurements of VF, the current review adopted the narrative synthesis process, following guidelines (Rodgers et al, 2009; Popay et al. 2006) and included aspects below:

1. Developing a "theory of change". The current review aimed to explore how VF is being defined and measured in the evidence base. The synthesis targeted at generating themes of how VF is being described in textual wordings and in terms of their functions (Table 3).
2. Developing a primary synthesis and exploring relationships within and between studies. This was done through the tabulation (Table 2) to first identify the key findings in terms of the relationship between VF and associated factors. To explore relationships within and between studies, a content analysis-informed strategy was used to synthesise findings across studies (Mays et. al. 2005) through an inductive approach by counting the labels of outcome variables across studies to form themes based on the frequency of appearance. For outcome variables that were difficult to group based on their labels due to differences in terminology being used, the author grouped them based on their described functions inductively (e.g. cognitive function, psychological distress etc.)
3. Assessing the robustness of the synthesis. To ensure the robustness of the outcome of the synthesis, the studies included were also critically appraised based on their strength and weaknesses. the limitations of this synthesis are also discussed.

Quality Appraisal

There were three case-control studies, two cohort studies and nine cross-sectional studies. As they adopted different methods of investigation, their qualities were critiqued using three different quality appraisal checklists: the Appraisal Tool for Cross-Sectional

Studies (AXIS; Downes et al. 2016; Appendix A), the CASP case-control appraisal checklist (CASP, 2018; Appendix B) and the CASP cohort study appraisal checklist (CASP, 2018; Appendix C). Whilst all the included studies adopted quantitative methodology, the heterogeneity in the methodology to measure VF made it difficult to conduct a meta-analysis across studies that measured similar constructs.

Results

Study Characteristics

A total of 14 quantitative papers were included in the review, as presented in Table 2. Nine studies adopted a cross-sectional design, two adopted a case-control design, and three were cohort studies. The studies were conducted in different countries including the USA, Canada, Denmark, the Netherlands, Germany, and Australia.

Five cross-sectional studies considered the association between VF and aggression as their primary aim of investigation. In addition to the primary aims, one study explored the impact of different personality traits on the association between VF and aggression (McCreery & Katheleen-Krach, 2018). One study also explored the influence of thought control strategies and VF on aggression (Nagtegaal et al. 2006). Moreover, two studies also considered the role of VF on aggression in addition to exposure to violence, one of which considered the impact of cognitive and situational factors (fantasy absorption, gender and dysphoric fantasy; Smith et al. 2009) and the other also considered VF in addition to childhood antisocial behaviours and recent alcohol use (Watt et al., 2010). Similarly, one study also explored the impact of the harmful use of alcohol with VF on aggression (Watte et al., 2013).

The impact of VF on the association between violent exposure and physical aggression was also explored in two studies, one of which recruited adult participants in the community with a cross-sectional design (Watt et al. 2010) and the other recruited elementary

school students with a six-year cohort study design (Guerra et al. 2003). One case-control study explored the differences in the prevalence of VF between mental health inpatients and healthy controls in the community, and in violent acts reported post-discharge from the hospital between people with and without VF (Grisso et al. 2000). One case-control study also investigated the individual differences in frequency of aggressive acts reported retrospectively and prospectively and the level of psychological distress between people with or without VF (Moeller et al., 2016)

Three cross-sectional studies investigated the association between violent daydreaming (used interchanging with VF) and suicidality. Two of them also further explored the impact of VF on the association between suicidality and cognitive memory deficits (Chu et al., 2016), and the relationship between VF and thwarted social needs (Chu et al., 2017). One case-control study explored the relationship between VF and subjective well-being and the impact of rumination on the relationship (Poon & Wong, 2021). Similarly, one study also investigated the relationship between anger rumination and VF (Hardin et al. 2022).

Definition of The Key Term - VF

Textual Description

There were some variations in terms of the terminology used to describe violent fantasies. Three studies used "violent fantasies"; three studies used "violent daydreaming", and two studies used "imagined violence" and "violent imagery". All of them were used interchangeably with VF. Five studies used the term "aggressive fantasies".

In terms of the textual descriptions of the terminology (Table 3), studies described VF as mental imagery of hurting others (Grisso et al. 2000; Hardin et al., 2022; Poon & Wong, 2021; Watt et al., 2013) and were hostile (McCreery & Kathleen-Krach, 2018). In addition to just a form of mental imagery, three studies described it as scripts based on exposure to violence

previously (Moeller et al. 2017; Nagtegaal et al. 2006; Guerra et al., 2003). In studies that used violent daydreaming as their primary terminology, the authors described it as vivid and enduring mental imagery that could include themes related to death, suicide, and revenge (Selby et al. 2007; Chu et al. 2016; Chu et al. 2017). Lastly, one study did not provide further textual description of VF other than describing its functions.

Functions

A Rehearsal in Mind. Most studies drew on the social information processing model (Huesmann, 1988) to explain the role of VF. Yet, there were still some variations in their definitions. Nagtegaal et al. (2006) encapsulated VF in a range of rehearsal processing: "*Rehearsal involves mechanism varying from simply recalling the original scene, to* ***fantasizing****, ruminating and play-acting*" (p.1398). Five studies suggested that VF was a rehearsal of violent acts in one's mind to form aggressive scripts (Smith et al. 2009; Grisso et al., 2000; Mccreery and Krach, 2018; Watt et al., 2013; Poon & Wong, 2021). Yet, four studies suggested that it was a rehearsal of the aggressive scripts which make them more easily accessed when responding to social situations (Hardin et al., 2022; Nagtegaal et. al. 2006; Guerra et al. 2003; Watt et al., 2010), with an aim to "maintain the initial encoding (of the observed violent behaviour) in the memory" (Nagtegaal et al. 2006; p.1398) and are "unconstrained by reality" (Poon & Wong, 2021; p. 6391). This suggested that VF might serve functions in both forming and maintaining an aggressive script for individuals to access when facing social situations. Two studies only named VF as "hostile mental images" (McCreery & Krach, 2018) and "imagined violence" (Grisso et al. 2000). None of the above studies mentioned the element of fanciful thought in the experience with VF except for Poon and Wong (2021).

A Cognitive Retreat. Aside from rehearsing their aggressive scripts and behaviours, a few studies that focused on the scope beyond aggression as an outcome adopted different

perspectives to conceptualise VF. While they considered VF interchangeably with violent daydreaming, Selby et al. (2007), supported by Chu et al. (2016) and Chu et al. (2018) suggested that VF was an experience of spontaneous, "vivid" and prolonged mental images about death, suicide, and revenge (Chu et al., 2016; Chu et al., 2018; Selby et al., 2007). They proposed that other than serving the function similar to script rehearsal in forming and practising the violent mental image (i.e., cognitive sensitisation and rehearsal) or to habituate to the pain and consequences of the action (i.e. normalisation), VF might also be considered as a form of maladaptive emotional regulation strategy to deal with or escape from difficulties stemmed from challenging interpersonal relationships or other stressors (Selby et al. 2007).

Table 3.

Textual Descriptions of VF and Their Functions Summarised from The Included Studies.

Study	Quotes	Functions
Grisso et al. 2000	"…imagined harm to others" **(**p.389)	A rehearsal in mind
Hardin et al., 2022	"Imagined violence, which consists of thoughts or daydreams about hurting another" (P.1881)	
Poon & Wong, 2021	"…envision inflicting aggressive acts on others"	
Watt et al., 2013	"Fantasise about hurting others" (p.453)	
Moeller et al. 2017	"Mental rehearsal of aggressive scripts", scripts were described as " a repertoire of aggressive behaviours after exposure to violence" **(**p.269)	
Nagtegaal et al. 2006	The mental images were "a representation of the experience in memory"	
Guerra et al., 2003	"Fantasising about aggressive script" (p.1563)	
McCreery & Kathleen-Krach, 2018	"…aggressive fantasies (i.e. hostile mental images)" **(**p.92)	
Watt et al., 2010	"Fantasies of violent acts"	
Watt & Allan, 2010	"Fantasising about aggressive actions" (p.283)	

Study	Quotes	Functions
Smith et al. 2009	No textual descriptions other than the rehearsal functions of VF were provided.	
Selby et al. 2007	"a sort of daydreaming or fantasising in which they can see their death in imagination, as if they are watching a clear vivid video of their own death by suicide" (p.867)	A cognitive retreat
Chu et al. 2016	"…spontaneous fantasies and daydreaming about violent acts, such as death, suicide, and revenge". (p.731)	
Chu et al. 2017	"… specific periods of enduring, vivid and emotional thoughts about violent acts such as death, suicide, and revenge."; "… a spontaneous fantasy." (p.12)	

Critique of The Included Studies

Strengths

The studies included in this review covered a wide range of samples in the population. They recruited participants from universities (Chu et al., 2016; Chu et al., 2018; Nagtegaal et al., 2006; Selby et al., 2007); general public in local or online communities (McCreery & Krach, 2018; Poon & Wong, 2021; Watt et al., 2010; Watt & Allard, 2010; Watt et al., 2013); hospitals (Grisso et al. 2000; Hardin et al. 2022), prisons (Moeller et al., 2017) and community urban settings (Guerra et al., 2003; Smith et al., 2009). 12 studies that recruited adults were reported to have an age range of 17-67 and 4-14.5 for the two studies that recruited children and adolescents. Although this might impact the homogeneity of the samples recruited across studies, the variation of samples could help generalise the understanding of VF across different contexts.

Weaknesses

Although studies attempted to recruit participants that were representative to their aims, sampling bias should be considered. Eight studies recruited samples using questionnaires distributed online or locally via mail posts. This might be subject to self-selection bias as people who responded to the advert might be more proactive, such as two studies recruiting undergraduates registered on a psychology course without specific justifications (Chu et al. 2017; Selby et al. 2007). Moreover, three studies also recruited from the same geographical area which could potentially have included overlapping participants and one of them had a response rate of 15% (Watt et al., 2013) which might subject to non-response bias. Given the variation in the previous report of significant differences across ethnicity and socioeconomic background in VF (Grisso et al., 2000; Guerra et al., 2003; Smith et al., 2009), the applicability of the findings across settings should be considered with caution.

In terms of the gender distribution in the included studies, while seven studies had female-only or female majority samples, five studies included samples with male-only or had a slightly higher proportion of male in their sample. Only five studies attempted to address the effect of gender on their main investigation by including gender as a covariate to the analyses or providing clear justification as to why only a certain gender was recruited in their studies. Given that VF was more frequently reported in male (Smith et al., 2009), these outcomes should be interpretated with caution.

There was a noticeable difference in terms of the sample size across the studies included in the synthesis. Three studies had sample sizes above 1000 participants with the largest being 4458 participants (Guerra et al., 2003). However, five studies acquired their data from wider studies (Chu et al. 2017; Hardin et al., 2022; Grisso et. al. 2000; Guerra et al. 2003; Smith et al. 2009), two of which acquired the same sample. Although one of them

acquired a local control group for their study (Grisso et al., 2000), the same case group was presented in both studies. This indicates that the sample might be subject to selection bias (Smith, 2020). Nonetheless, only four studies provided clear *a priori* or *posteriori* power calculations to justify their sample size and the statistical power achieved from their data analyses. Therefore, the generalisability of the outcome might be impacted.

Methodological Variations for VF Across Sample. Nine studies adopted a cross-sectional design with VF only measured at a single time point. Therefore, the outcome of the studies could not infer directional or casual relationships between factors. Although three cohort studies compared aggression between individuals with or without VF, only one of them measured the intensity and the severity of VF also (Guerra et al. 2003). This raised some concerns regarding the methodology used to measure VF across studies. Seven studies used the Schedule of Imagined Violence (SIV; Grisso et al., 2000) to measure VF. Although the SIV was originally developed as an eight-item measurement of VF, two studies reported variations in the number of items included in SIV but they didn't report detailed information about the modifications. Also, in the original study, three SIV items (presence of VF, recency, and frequency) were used to dichotomise participants into groups with and without VF (Grisso et al., 2000). Yet, variations were reported in the items being used as the grouping variable of people with VF. Moreover, the dichotomisation might have disregarded the richness of VF experience. Therefore, the use of SIV might not be able to encapsulate the full picture of VF. Two studies used the aggressive fantasy subscale of the Child Fantasy Inventory (CFI; Rosenfeld et al., 1982). However, low to moderate internal consistency was reported with CFI across both studies. While one study attempted to address this by reloading the factor structure into three sub-scales (Smith et al., 2009), the inconsistency in the factor loadings might have impacted the generalisability across these two studies. Lastly, the "thought revenge subscale" of ARS (Sukhodolsky et. al. 2001) was used in three studies to

measure violent daydreaming. Whilst it was suggested that the ARS was highly associated with SIV to support its validity in measuring VF (Chu et al., 2016), the measured construct might not accurately reflect VF due to the potential conceptual overlapping with rumination (Hardin et al., 2022). This was also reflected in one study where the ARS was used to measure rumination specifically but not VF (Poon & Wong, 2020)

One study conducted an experiment to prompt the participants to imagine hurting someone they can think of (Poon & Wong, 2021). However, the experiment might still be susceptible to response bias as participants completed a self-reported measure to check the effectiveness of the experimental manipulation (Poon & Wong, 2021). Moreover, the experiment purposefully asked the participants to fantasise about violent acts about another person which did not theoretically follow the definition of fantasies being spontaneous, as suggested in other studies (Chu et al. 2016; Selby et al., 2007). While the variations in the methods to measure VF provided a richer understanding of VF, the inconsistency across studies of these methods made it difficult to ensure that the studies were measuring the same construct of VF.

Preliminary Synthesis of Findings Across Studies

Table 4

Themes Capturing Findings from The Included Studies.

Themes	Sub-themes
Risk of aggression	Exposure to violence
	Beliefs about aggression
Conceptual correlates and overlaps	Rumination and other cognitive correlates
	Memory deficits
Impact on psychological wellbeing	Suicidality
	Social isolation

Risk of Aggression

In the included studies that explored the relationship between VF and aggressive behaviours, researchers claimed that VF was a form of internal process that allows the rehearsal of aggressive scripts and leads to a higher level of aggression across different samples (Grisso et al., 2000; Guerra et al., 2003; McCreery & Krach, 2018; Moeller et al., 2017; Nagtegaal et al., 2006; Smith et al., 2009; Watt & Allard, 2010; Watt et al., 2010; Watt et al., 2013). However, whether VF could be considered as a risk of aggression should be carefully considered, particularly based on how several other factors were also explored and considered when looking at the relationship between VF and aggression.

Exposure to Violence. Previous exposure to violence was thought to be associated with the formation of initial coding of cognitive scripts, and VF would allow the acquired aggressive scripts to be rehearsed and practised internally. In a forensic mental health service setting, males who reported having more frequent VF were more aggressive than those who did not have VF (Moeller et al., 2016). While this might have supported that contextual factors play a role in the development of scripts, this could also support VF as a mental rehearsal process that led to aggression. Smith et al. (2009) found that children and adolescents who experience a high level of VF did not engage in more aggressive behaviours if they had not been previously exposed to violence in the community. Even for adults who had previously been a victim of violence in their childhood, VF was only able to partially address the increase in aggressive behaviours as adults in a non-clinical population (Watt & Allard, 2010). Nonetheless, Guerra et al. (2003) found that male elementary school students who fantasise about hurting others were reported to have more exposure to violence in later years, which they argued could potentially be explained by male students normalising violent acts or behaviours through VF. The juxtaposition of VF in its function of rehearsing existing scripts or pre-empting the individuals to seek out violence would require further

investigations. Yet, this suggested that the presence of VF alone might not be the best indicator of aggression.

Beliefs about Aggression. VF was also suggested in previous literature to serve the function of normalising aggressive behaviours through script rehearsal. However, Smith et al. (2009) suggested that in children and adolescents without previous exposure to violence, their beliefs about the use of violence might be the protective factor that prevents further aggression even when they engage in VF. This was supported by the findings of Guerra et al. (2003) and Watt et al. (2010) in that having normalised views about using violence and aggression in response to different provocative situations but not VF was associated with aggression. Although there was a higher number of violent acts reported after being discharged from the hospital in patients who reported persistent VF (i.e. report of VF within 20 weeks after discharge; Grisso et al., 2000), beliefs about aggression were not measured amongst the participants. Similarly, a stronger association was found between violent fantasies and aggressive behaviours when individuals engaged in more harmful alcohol use (Watt et al., 2013). The researchers drew on the script theory (Huesmann, 1988) and the generalised aggression model (GAM; Anderson & Bushman, 2002) to argue that VF reinforced the attitude on the use of aggression and with the disinhibition effect from the alcohol more aggressive behaviours were presented. However, this remained speculative as data were only collected at one time point, and the changes in normalised belief on violence were not measured. Personality traits such as agreeableness to pro-social behaviours were also found to be negatively associated with VF in social media users (McCreery & Kathleen-Krach 2018). Normalising violence might be the individual's tendency of unwillingness to conform to societal norms, leading to a higher level of VF. Nonetheless, the relationship between attitudes towards aggression and VF remained correlational.

Cognitive Correlates and Conceptual Overlaps

Memory Deficits. Chu et al. (2016) found that VF positively mediated the relationship between suicidality and memory deficits (i.e. encoding and retrieval). The stronger statistical effect found in VF on the relationship between suicidality and memory retrieval (Chu et al. 2016) might have provided preliminary evidence to support the theoretical proposition of VF as an internal process for script rehearsal to allow the practised script to be accessed more easily. This relationship with suicidality might also be relevant to another study (Grisso et al.; 2000) which argued that people at a higher level of distress might experience more difficulties in accessing more complex and unrehearsed memories, leading to more frequent use of rehearsed scripts. Similarly, Poon & Wong (2021) also suggested that people who were distressed might be more attuned to unpleasant thoughts that were consistent with how they felt emotionally (Poon & Wong, 2021).

Rumination and Other Cognitive Correlates. Rumination was found to be positively associated with VF, in that people who fantasise about violence tended to think about it more frequently (Poon & Wong, 2021). However, this study modified an Anger Rumination Scale (ARS; Sukhodolsky et al. 2001) to measure the state rumination of the participants, whereas other included studies made use of the subscale of the ARS to measure VF (Selby et al. 2007; Chu et al. 2016; Chu et al. 2018). The same study also did not present any statistical information to identify any potential issues with multicollinearity between rumination and VF (Poon & Wong, 2021). Similarly, one study also found a positive correlation between anger rumination and VF in people who were hospitalised due to mental health difficulties (Hardin et al. 2022). They also suggested the potential conceptual overlapping between the two constructs and argued that their differences might be based on planning and envisioning aggressive behaviour (Hardin et al. 2022).

Nagtegaal et al. (2006) attempted to draw inferences on the associations between VF and thought control strategies such as thought suppression or re-appraisal to the outcome of aggression. However, their analytical method with correlational and regression analyses did not account for the potential inter-correlation between the VF and thought control strategies and their influence on aggression. Their regression analysis also suggested that VF was not significantly associated with aggression when considering the strategy of thought suppression. Therefore, the outcome should be interpreted with caution.

Additionally, fantasy absorption (FA) was found to be the second strongest factor associated with aggression (Smith et al., 2009). FA is defined as the heightened imaginative involvement in one's own fantasy (Parra & Argibay, 2012) and the measurement of FA was designed to measure the "immersiveness" of fantasies. While this might be out of the scope of the current review, such observation might have suggested that the VF measured in that study was presented with more prolonged and vivid imageries, similar to the definition of VF in another study (Chu et al., 2017) and provided more evidence to the spectrum of fantasy experiences.

Impact on Psychological Wellbeing

Psychological distress was also reported in individuals who engage in VF. One study found that male patients in a forensic mental health service who engage in VF presented with significantly more psychological distress (i.e., anxiety, depression, and some "psychotic" symptoms) when compared with those who did not (Moeller et al. 2017). In another study, VF was found to be negatively associated with subjective well-being - in other words, engaging in VF was associated with the experience of more negative emotions and lower life satisfaction (Poon & Wong, 2021). Generalisability should be interpreted with caution, given that the first study recruited a small and male-only sample from a clinical setting while the second study recruited participants that might not be representative to their aims.

Nonetheless, attention should be given to the psychological well-being of individuals who engage in VF.

Suicidality. There was a bi-directional association between VF and suicidality presented across three studies, in that a high level of VF was associated with more frequent suicidal thoughts (Selby et al. 2007; Chu et al. 2017); and a high level of suicidal ideation was associated with more frequent daydreaming about violent acts (Chu et al., 2016). However, it would be pertinent to note that while the association between VF and suicidality was also found to be dependent on the level of depression (i.e., high level of VF and depression was associated with high level of suicidality; Selby et al. 2007), the same effect was found in another study but only in participants without a history of suicidal ideation (Chu et al. 2017) which the authors drew on the potential conceptual overlapping between suicide and depression (Rogers et al. 2016b).

Social Isolation. The relationship found between VF and thwarted interpersonal needs (i.e. thwarted belongingness and perceived burdensomeness) suggested a possible reciprocal process between VF and increased social isolation to consider. On one hand, VF was associated with increased social isolation (Chu et al. 2017). Selby et al. (2007) suggested that other than habituating to violent acts, VF might allow the individual to habituate to the potential damages from fantasising about their interpersonal relationships, making them feel more disconnected from others. Chu et al. (2017) also suggested that engaging in VF might have reinforced a higher level of "inward focus" (p.10) which draws individuals' attention away from their loved ones, further impacting their sense of belonging and level of distress.

On the other hand, the increased loneliness might also lead to or reinforce VF. This might be due to the propensity of VF in being able to provide an escape from troubling interpersonal relationships and other challenging emotions (Chu et al. 2017). Yet, this form of coping strategy which allows the habituation process as described to take place might have

not only been ineffective in assisting the individual to cope with the stressors but also reinforced and normalised the violent acts in their fantasies. Although the positive relationship between thwarted interpersonal needs and suicidality was not explained by a higher level of VF (Chu et al. 2017), this reciprocating relationship between VF and social isolation might warrant further investigation in future studies.

Discussion

This narrative synthesis systematically reviewed the current literature about VF to integrate the understanding of its current conceptualisations, how it is measured and their associated factors in addition to aggression.

The 14 studies included in this review reported their sampling process, methodologies, and basic data and discussed their outcomes and limitations at various levels of detail. While the sampling procedure was detailed in studies, not all of them provided a clear justification of their sampling method or adjusted to the potential bias from the sampling accordingly. Also, the studies might also be subject to response bias as most of them relied on self-reported measures (Bogner & Landrock, 2016).

This review also provided a snapshot on the definition and the function of VF in the current evidence base. What appeared to be consistent across the different understandings of the experience of VF is that VF appears to serve a common function to cognitively experience and rehearse previously learned violent behaviours as behavioural responses for future social encounters, as supported by multiple theories (i.e. a cognitive rehearsal to create and consolidate aggressive scripts, Huesmann, 1988); or as a habituation process to the pain or consequence of the violent act towards oneself (Joiner, 2005). However, most of these studies have only explicitly described VF as a series of mental images about harming or injuring others, whereas the studies which explicitly explored VF in the form of daydreaming appeared to have provided richer insights into this perpetual and repetitive cognitive process.

It is worth noting that studies which considered VF as a form of mental images most frequently used the same measurement tool to ask their participants if they ever have "daydreams or thoughts" (Grisso et al., 2000) about hurting other people. This corresponds to previous evidence on the problematic and overlapping understanding between daydreaming and fantasy, as described by Klinger (1971, 2009), which might suggest that VF can be experienced as part of a daydream or as a fanciful thought itself. This provided further evidence into the possibility of understanding VF on a continuum of vividness and repetitiveness; on one side, VF as fleeting fanciful thoughts might allow the individual to cognitively reinforce and encode the aggressive scripts but on the other side, VF as a more repetitive and vivid form of mental imagery might also serve as a cognitive retreat and escape, in respond to events in life that might be painful and difficult to deal with. However, these studies failed to illustrate whether the form of VF that they were measuring, was the same as other studies, due to the lack of coherent and consistent measurement tools for VF. This was also suggested by the possibility of conceptual overlapping with other cognitive variables such as rumination and thought control strategies. The consideration of fantasy absorption also suggested the multi-faceted nature of fantasy experience. Nonetheless, the current review agreed with the previous review regarding the conceptual overlapping between VF and script rehearsal (Gilbert & Daffern, 2017) but argued that both the perpetual mental images of violence and the rehearsal of violence might be parts of the complex and intricate experience of VF.

The synthesis also showed that although there was evidence that supports the relationship between VF and aggressive behaviours, the experience of VF might not necessarily predate violence. Specifically, the wider context of the individuals who fantasise about violence should be thoroughly considered (e.g. previous exposure to violence and attitude towards violence). The conflicting evidence suggested that although VF might often

be reported retrospectively in people who were violent or aggressive, having VF alone might not necessarily indicate the aggressiveness of a person. Based the theory of planned behaviour (Ajzen, 1995), the subjective norms and attitude towards aggression might be stronger contributors to the form the intention to be aggressive. Therefore, a more thorough investigation of other contextual factors would be required.

This review also presented that engaging in VF was associated with poor psychological well-being. A lower level of subjective well-being and a higher level of psychological distress and suicidality were also reported. The association between rumination and VF might also indicate an increased risk of psychological distress (Firoozabadi et al., 2018). Moreover, the reciprocal relationship between VF and social isolation was suggested. It would be important to carry out thorough psychological assessments and formulations with individuals who fantasise about violence (Gellerman & Suddath, 2005), as they might also be experiencing a high level of psychological distress and would require further support.

Clinical implications

VF has been considered as one of the risk factors to future aggressive or crime-related behaviours in the last three decades within the justice system (Gellerman & Suddath, 2005; Palermo & Bogaerts, 2017). The findings about the associated factors to VF/AF, particularly in psychological distress and early experiences, signified the importance for mental health professionals to provide more comprehensive assessments to individuals who fantasise about aggression or violence. Such a finding is also in line with the previous evidence that the higher tendency to engage in vivid fantasy was associated with a higher level of emotional distress, especially when other maladaptive coping strategies such as rumination and catastrophising are present (Bacon & Charlesford, 2018).

The findings about the functions of VF (e.g. coping with painful emotions, and emotional regulation) also indicated some important directions for clinical interventions for

individuals who fantasise about violence. In Dialectical Behavioural Therapy (DBT; Linehan, 1993), VF about non-suicidal self-injuries (NSSI) and suicide (SI) were considered as some of the targeted areas of interventions for individuals with the diagnosis of borderline personality disorder. Introducing mindfulness strategies in DBT protocols to work with the unpleasant emotions with the fantasies in mind, can potentially help people with VF to practice withdrawing their attention from their conscious fantasy to improve their present-moment awareness. The preliminary findings in the use of mindfulness training in people with Maladaptive Daydreaming (MD) suggested its effectiveness in managing their frequency and intensity of their daydreams (Herscu et al., 2023). By providing intervention targeting at developing more healthy and adaptive coping strategies to distress, it may also be effective in reducing the tendency and need to engage in VF. For example, subsequent studies suggested that DBT was effective in reducing the frequency, intensity, future likelihood and duration of SI and the intensity of NSSI (Rizvi & Fitzpatrick, 2021). DBT was also found to be effective in reducing anger and potentially effective in reducing aggression (Ciesinski et al., 2022).

Given that the engagement in VF was associated with social isolation, psychotherapy which addresses psychological distress about interpersonal relationships and attachment as psychodynamic or interpersonal psychotherapy (Markowitz & Weissman; 2004) could be helpful for individuals to address the effects of their interpersonal relationships on their wellbeing.

Research Implications

The findings from the current review suggest that there are no consistent measurement tools to measure VF across different populations. Therefore, a new form of measurement tool for VF either self-reported or experimental protocol similar to mind-wandering studies (e.g. Weinstein, 2018) is warranted.

Also, the findings in the included studies indirectly suggest different levels of VF, ranging from imaginative violent thought to rehearsing violent acts to a high level of absorption to cope with distress in real life. While there are some commonalities in terms of associated factors across these levels, the findings we have currently may not be generalisable across them given the structural differences in these fantasies. Research in the past two decades had looked into individuals who would purposefully immerse themselves self into fully imaginative daydreaming plots or scenarios - Maladaptive daydreaming (MD; e.g. Somer 2002, Somer et al. 2016; Schimmenti et al., 2019). These fantasies would often involve the immersion in fantastical daydreams for hours a day which impact people's daily life functioning. In the feedback loop of MD, the large amount of time people with MD (PwMD) spent in the fantasied world of their daydreams reduced their time to establish and maintain meaningful social relationships in real life leading to a higher level of distress, and this increase in distress also prompted further engagement in MD (Somer et al., 2016). This reciprocal pattern in MD might be similar to the reciprocal relationship between VF and social isolation found in this review. In MD studies, fantasies served the purpose for PwMD to escape from distressing life situations and regulate painful emotions (Brenner et al. 2021; Greene et al., 2020; Somer et al., 2016b; Somer et al., 2021). These studies also drew on the construct of benign masochism, originally coined by Rozin et al. (2013), about individuals seeking pleasure from pain (Greene et al., 2020; Lucas; 2021; Somer et al., 2016b; Somer et al., 2021). Similar to VF, exposure to traumatic experiences was found as a risk factor for MD when fantasy absorption was considered (Somer & Herscu, 2017). They also discussed the themes of fantasies and drew references to individuals who have aversive fantasies in their daydreams. Emotional dysregulation was found to be associated with MD, particularly the aversion to anger in real life (Lucas, 2021). Whilst the findings in this review might not be fully applicable to this area of MD, the similarity between VF and MD in terms of their

functions and impact on interpersonal relationships and psychological distress might warrant further investigations. Also, given that PwMD do not act on their fantasies (Somer et al., 2016c), further investigation on how fantasies and behaviours are associated is warranted, which can also help destigmatise the experience of VF. Future studies could explore aversive fantasies in MD (MD-AF; Lucas, 2021) and their psychological correlates to provide further evidence to the current understanding of the world of negative fantasising.

Limitations

To assess the robustness of the synthesis, the limitations of the current review are addressed critically. Given that only quantitative studies were included in this review with a great level of heterogeneity on the measurement tools used to operationalise and quantify VF, the current synthesis could only adopt the technique of textual and narrative synthesis on the outcomes of the studies to identify common themes across studies. However, this type of methodology (narrative synthesis) might be subject to bias as the synthesis process was based on the interpretation of a single researcher (Campbell et al., 2018). Also, given that the synthesis attempted to gain a better understanding of VF in the current evidence base, this review included only quantitative studies which might limit the richness of the theoretical and practical understanding of VF.

Whilst the included studies encapsulated a wide range of samples including working-age adults who might or might not have diagnoses of mental health difficulties, children and adolescents aged from 4-14, university students and prisoners, such heterogeneity in the sample sizes, the demographic profiles, and the imbalanced proportion in the number of studies that measured these samples could impact the generalisability to the wider population. Also, the lack of studies conducted with the sample in the UK affected the generalisability to the local population.

Moreover, most studies were cross-sectional and correlational, and most of them relied on self-reported measures, which might have possibly amplified the response bias especially when social desirability was found to be highly associated with the outcomes in the included studies. Also, all of the included studies were conducted in Western countries, which might also impact the generalisability to the overall population.

Conclusion

This review provided an overview of the current literature about VF and their associated psychosocial, interpersonal, and cognitive factors. Though VF was found to be associated with aggression, it might not be the best indicator of future violent acts without considering other contextual factors such as exposure to previous violence and attitude toward the use of violence. Engaging in VF might also potentially lead to a higher level of psychological distress. The review also showed that the current understanding of the conscious fantasy of violence as a construct is limited, and measures used to identify VF vary. Viewing fantasy on a continuum might help the evidence base to have a better conceptualisation of fantasy, which could range from a thought or imagination to a full immersion into one's fantastic world of imagination. More research in this area is warranted.

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Section B: Empirical Paper

The Benefit of Pain? A Quantitative Investigation into The Associated Factors of Aversive Fantasies in Maladaptive Daydreaming.

To be submitted to: *Imagination, cognition and personality: Consciousness in Theory, Research, and Clinical Practice*

Word count:7996 (109 words)

Abstract

Objectives: Aversive fantasies in maladaptive daydreaming (MD-AF) have been previously reported to serve a function for people with MD to seek pleasure through themes that were usually dark and with high level of emotional pain. This study aimed to replicate existing findings to MD-AF specifically, and further explore the roles of psychological pain, benign masochism, and avoidance of anger in MD-AF.

Methods: 116 people who experience MD-AF were recruited online. Participants completed scales measuring MD (Maladaptive Daydreaming Scale), trauma exposure (Trauma Antecedents Questionnaire), emotional dysregulation (Difficulty in Emotional Regulation Scale), psychological pain (Psychache Scale), benign masochism (Benign Masochism Scale) and avoidance of anger (Avoidance Motivated Response to Anger Scale). Correlation and hierarchical regression, and mediation analyses were conducted to testify the hypotheses.

Results: In an MD-AF sample, emotional dysregulation was significantly associated with MD when controlling for the impact of age, gender, and trauma exposure. Subsequent analysis revealed that behavioural avoidance of anger was a sub-type of emotional regulation strategy in MD-AF. Psychological pain mediated the relationship between exposure to trauma and MD-AF. No significant association was found between benign masochism and MD.

Conclusions: MD-AF was associated with more difficulties in regulating their emotions. The role of psychological pain in MD-AF also indicated targets for treatment considerations, such as emotion-focused therapy and psychotherapy. Future studies should consider a more accurate identification of MD-AF and the longitudinal impact of MD-AF on psychological distress.

Keywords: maladaptive daydreaming; aversive fantasies; emotional dysregulation; trauma; psychological pain

Introduction

Maladaptive Daydreaming (MD) is a recently proposed mental health condition which is characterised by dissociative absorption in self-created daydreaming plots compulsively and excessively, leading to a significant level of distress (Bigelsen & Schupak, 2011; Somer, 2002; Somer et al., 2016b). It is considered a type of behavioural addiction and is associated with other types of psychological disorders, such as dissociative disorder and obsessive-compulsive disorder (Salomon-Small et al., 2021; Soffer-Dudek, 2019). People with MD (PwMD) often find themselves spending half of their waking time absorbing themselves in their daydreams with significant difficulties in controlling their tendency to daydream (Soffer-Dudek & Theodor-Katz, 2022). This cause interferences with their capacity to achieve their life goals, socialise with people, attend to real-world responsibilities or even sleep (Bigelsen & Schupak, 2011; Bigelsen et al., 2016). It is also estimated to be significantly more common among younger adults aged between 18-30 (Schimmenti et al., 2019; Soffer-Dudek & Theodor-Katz, 2022).

These internally created wakeful and fanciful imageries usually involve detailed plots, characters and backgrounds (Bigelsen & Schupak, 2011). They are affect-laden (Somer et al., 2016c) and accompanied by a high level of uncontrollable absorption, strengthened by repetitive kinaesthetic movements such as pacing or rocking movements and listening to music (Somer et al., 2016c). The level of details in the fantasy plots, the highly absorptive nature, and the associated impact on PwMD's psychological well-being and functioning are what differentiate MD from normal daydreaming or mind-wandering activities proposed by previous researchers (Klinger, 1971; Singer, 1966; Singer, 1975). As PwMD are aware of being the creator of the internal world themselves and the distinction between their daydreaming plots and realities (Somer et al., 2016c), MD is also different to other psychosis-related conditions. Evidence also supports that MD is generalisable across different cultures

with measurement tools that have good validity and reliability (Sándor et al., 2020; Schimmenti et al., 2019; Soffer-Dudek et al., 2021; Somer et al., 2017).

The Functions of MD

MD is considered a form of coping strategy that PwMD adopted to cope with or escape from distressing real-life situations, as these fantasies usually serve the purpose of wish fulfilment and mood-enhancement (Somer, 2002). The experience of immersing in an internally constructed world provides a unique opportunity for PwMD to access the emotions or experiences they lack in real life (Bigelsen & Schupak, 2011; Bigelsen et al., 2016). For individuals who experienced traumatic life events, MD is also seen as a form of coping to help them regulate painful memories and emotions (Musetti et al., 2023; Somer et al., 2016b; Somer et al., 2021). However, this form of coping strategy, instead of reducing distress, appears to be associated with an increase in negative emotions and distress following one's daydreams (Wen et al., 2022). Somer et al. (2016c) proposed a vicious cycle of MD - the development of MD was seen initially as a strategy to cope with distress and unwanted emotions in real life. However, the amount of time one spends immersing in their daydreaming worlds, and their inability to limit or control their daydreaming behaviour inadvertently leads to increased distress in real life, causing an increase in MD. MD might have only provided momentary relief of distress during the daydreaming process. Nonetheless, the consequences of engaging in MD may exert a more significant influence on the individuals' emotional well-being as their level of distress is negatively reinforced by the realisation of what is lacking in their daily living (Wen et al., 2022).

The Diversity in MD

MD is seen as a form of coping strategy with wish-fulfilment properties that would typically be presented with themes associated with a positive connotation (Somer et al. 2016a). Yet, MD with themes that aimed at evoking painful emotions was also documented

(Somer, 2002). To date, only a few studies (Brenner et al., 2022; Lucas, 2021; Somer et al., 2016b; Somer et al., 2021) explored MD with aversive themes, of which only one conducted an in-depth exploration of aversive fantasies (MD-AF; Lucas, 2021). This specific sub-type of MD was considered as individuals who engaged in fantasies that might include but were not limited to themes associated with death, emotional suffering, physical violence as a victim, being a captor, being rescued or the rescuer (Lucas, 2021; Somer et al., 2021). It was initially proposed that these negative or aversive MD themes might be acting as a reminder of threats experienced in real life, which further encourages the avoidance of such experiences in real life by engaging in MD (Somer, 2002). Yet, PwMD who seek aversive emotions in their daydreams reported that they have found the experience enjoyable (Somer et al., 2016c). Though the use of MD-AF was reported to regulate painful emotions from exposure to trauma (Somer et al., 2021), the experience of MD does not necessitate exposure to traumatic experiences (Somer & Herscu, 2017). Therefore, the theoretical underpinnings of MD-AF remain speculative.

Seeking pleasure through pain – benign masochism

Somer et al. (2016c) referenced the theory of Benign Masochism (BM) as the probable explanation for the experience of pleasure derived from pain or suffering in daydreams. BM postulates that individuals derive pleasure from experiences their mind perceives as threatening when it simultaneously recognises that there is no real threat and has been fooled (i.e. hedonic reversal; Rozin et al., 2013). The pleasure derived from this simultaneous activation of positive and negative affect is based on the individuals being able to reach a certain level of distance from the apparent threat (Rozin et al., 2013). It was suggested that PwMD being the creator of their fantasies might be the key to achieving the "mind over body" state, leading to pleasure from pain (Somer et al., 2016c). BM as a probable reason to explain emotional sufferings in MD was further supported by a qualitative

inquiry that AF might be a specific subgroup in the world of MD (Lucas, 2021). Yet, no further evidence has been established between MD-AF and BM.

Associated Factors to The Experience of MD

MD and Emotional Dysregulation

Emotional dysregulation is defined as "a pattern of emotional experiences and expressions that interferes with appropriate goal-directed behaviours" (p.876, Beauchaine, 2015). This definition drew from the functional theory of emotions, which conceptualised emotion both as a regulator which influences an individual's reaction or non-reaction to emotions in a flexible and socially acceptable way; and as being regulated which suggested that emotions could be regulated to allow more goal-directed behaviours to take place (Cole et al., 1994; Cole et al., 2019). Maladaptive ways of reacting to emotions (e.g. withdrawal, avoidance, or escape) or regulating emotions (e.g. over- or under-regulation) to return to goal-directed behaviours have been found to underpin different forms of distress and psychological disorders (Beauchaine & Cicchetti, 2019; Cole et al., 2019). Evidence suggested that PwMD were generally presented with a higher level of emotional dysregulation (Greene et al., 2020; Pyszkowska et al., 2023; Sándor et al., 2023a; Thomson & Jaque, 2023). Experiential influences, especially in the familial context, also contributed to the development of emotional dysregulation (Thompson, 2019). Trauma experienced during developmental stages was also found to have a potential impact on an individual's emotional processing (Marusak et al., 2015). Due to the propensity of MD being a rewarding experience that provides a fleeting escape for PwMD from emotional pain and loneliness (Somer & Herscu, 2017; Schimmenti et al., 2019), MD can be seen as an avoidance-based coping strategy.

MD-AF was also postulated as a specific type of avoidance of anger in real life that allow PwMD to access and experience the anger in the forms of self or other-directed

aggression in a controlled environment at a safe distance (Lucas, 2021). Anger is mostly an approach-motivated emotion, meaning that individuals tend to react to anger behaviourally when their goal or expectation is "violated" or disrupted (Carver & Harmon-Jones, 2009). However, a behavioural tendency for individuals to engage in avoidance behaviours when feeling angry was also reported (Szymaniak et al., 2022), which could be what PwMD with MD-AF adopted. Nevertheless, further evidence of this association is lacking.

MD and Trauma Antecedents

The positive association between MD and traumatic childhood experiences was reported in the first qualitative exploration of MD (Somer, 2002). Mixed findings have been reported regarding the relationship between childhood trauma and MD (Abu-Rayya et al., 2020; Bigelsen & Schupak, 2011; Bigelsen et al., 2016; Somer & Herscu, 2017; Somer et al., 2021), which might indicate that the development of MD does not necessitate the experience of trauma. Nonetheless, Somer and colleagues (2021) found a positive relationship between the function and content of MD in adulthood and the history of childhood trauma. They suggested that the experiences of childhood emotional and physical abuse were associated with a higher level of MD aimed at regulating emotional pain (Somer et al., 2021). Also, they found that the experience of emotional abuse in childhood was associated with the activation of MD themes to evoke emotional sufferings and dark themes such as death, physical violence as victims or being a captor (Somer et al., 2021). Extending beyond traumatic experiences during childhood, trauma experienced at any life stage was also positively associated with MD (Musetti et al., 2023).

Psychological Pain. The function of MD to distract from or regulate emotional pain was reported (Somer et al., 2021), though the construct of psychological pain (PP) was not directly measured. The concept of psychological pain was seen as conceptually challenging to define due to the subjectivity of individuals' experiences (Yager, 2015). One of the definitions

was proposed by Shneidman (1993). He described psychological pain as an intolerable psychological state in one's mind. While psychological pain appeared to be an internal experience, the experience of such pain was found to have similar activation in the pain region from physical pain due to tissue damage (Mee et al., 2006; Zhang et al., 2019). Psychological pain was also found to be positively associated with a history of traumatic experiences in childhood (Holden et al., 2022). A high level of emotional pain was associated with self-harm (Holden et al., 2020), to regulate one's emotions (Cipriano et al., 2017; Linehan, 1993) and escape from (Schimmenti et al., 2019) or cope with psychological pain despite the effect of relief being short-lasting (Persano, 2022). In the psychotherapeutic stance, self-harm was also suggested to serve the function of helping an individual feel, dissociate from overwhelming feelings and express anger (Nathan, 2006). Given that self-harm could be presented in both direct and indirect forms based on whether the harm involves "immediate and deliberate damage to body tissue" (D'Agostino et al., 2020; p.3), its function of escaping from the psychological pain presented an intriguing perspective, particularly considering its analogous function to MD in regulating and distracting from emotional pain (Somer et al., 2021). With MD-AF being able to inflict psychological pain, it could be speculated that MD-AF was a form of indirect, non-physical self-harm that served the purpose of accessing or managing negative emotions. However, no studies to date have explored the role of psychological pain in MD.

Research Aims

The emerging evidence in MD has established the potential role of understanding trauma exposure and emotional dysregulation in MD. Yet, the specific role of behavioural avoidance to anger in MD-AF and their relationship with ED remained unexplored. Therefore, the current study aimed at exploring the role of anger avoidance in MD. Also, this study aimed at exploring the role of benign masochism, in whether individuals' preference in

gaining pleasure out of aversive experience could explain this intricate phenomenon of hedonic reversal in MD-AF.

Moreover, the current study also aimed to explore whether psychological pain could potentially explain the relationship between trauma and MD-AF. This study served as a novel quantitative inquiry to explore the role of BM, PP, and anger avoidance (AA) in MD-AF. The rationale for investigating the impact of AA and PP in MD-AF was to explore whether these specific emotional experiences would contribute to or maintain the experience of MD-AF, thereby potentially identifying targets for treatments in the future. Moreover, evidence from the association between BM and MD-AF would help strengthen the theoretical proposition of this mechanism of hedonic reversal.

Hypotheses

Based on the rationale above, the following four hypotheses were tested in people with MD-AF (Hypotheses 1 and 2 were illustrated in Figure 1; and hypotheses 3 and 4 in Figure 2):

Hypothesis 1: Emotional dysregulation and Anger Avoidance respectively were positively associated with MD-AF, with age, gender, and trauma exposures as co-variate.

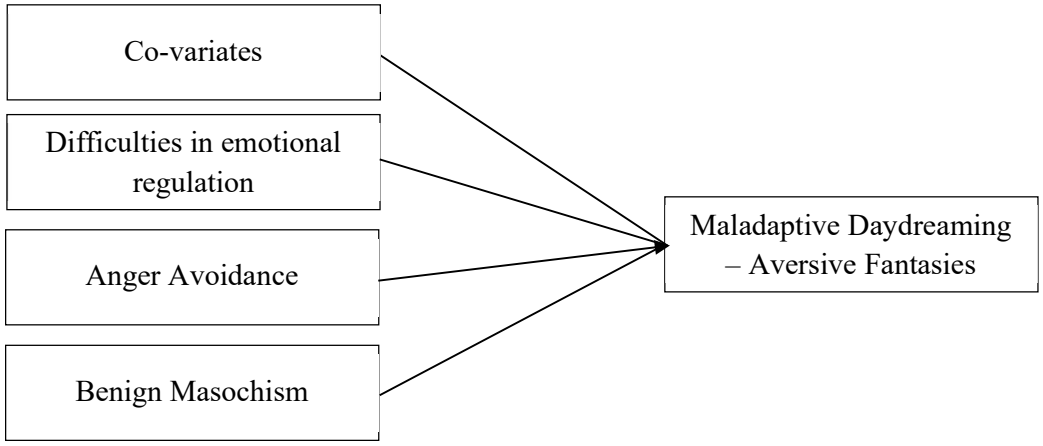
Hypothesis 2: Benign masochism was associated with a higher level of MD-AF, with age, gender, and trauma exposures as co-variate.

Hypothesis 3: Trauma exposure was positively associated with MD-AF**.**

Hypothesis 4: Psychological pain statistically mediated the association between trauma exposure and MD-AF**.**

Figure 1

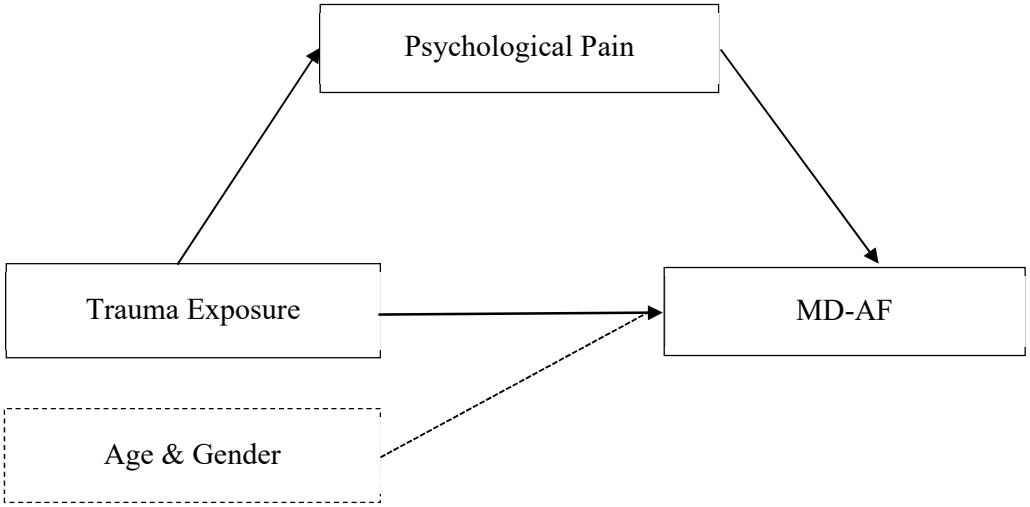
The Proposed Hierarchical Regression Analysis for The Association between MD and Emotional Dysregulation, Anger Avoidance and Benign Masochism.



Note. Age, gender, and trauma exposure are added as co-variates.

Figure 2

The Proposed Mediation Model with Psychological Pain as the Statistical Mediator between Trauma Exposure and MD-AF.



Note. Age and gender were added as co-variates.

Methods

Design

A cross-sectional design was adopted in this study, which involved asking participants to complete an online questionnaire examining MD, exposure to trauma, BM, PP, and AA at a single time point. Therefore, the results of this study were not expected to establish causations between proposed variables but rather the associations between MD and the other factors. It adopted a philosophical position of positivistic epistemology.

Consultation with An Expert by Experience

An expert by experience (EBE) who self-identified as PwMD with AF was recruited via the social media platform (Discord), within which PwMD had established a community that provided peer support. The EBE was consulted at the stage of designing the study, piloting the data collection, and disseminating the results. Their feedback was used to inform the measurement tools used to collect data, evaluate the sensitivity and appropriateness of the demographic questionnaire and consent forms, and the accessibility of the results for the participants.

Participants

There were substantial online MD communities (e.g. over 107,000 members on this specific MD community r/MaladaptiveDaydreaming, retrieved online on January 29, 2024) and previous MD studies have successfully recruited participants through forums (e.g. Somer et al., 2016b; Thomson & Jaque, 2023). Given that there is difficulty in accessing PwMD from health services, the current study recruited participants through online social media platforms (Reddit and Discord) and an online newsletter for PwMD (The Daydreamers) using a digital poster. Therefore, the participants were recruited internationally. The inclusion criteria of the participants were that they were aged 18 years or above, and fluent in written English. Also, as the current study focused on people who had or were having current

experience with MD-AF, only participants who scored above 40 on the maladaptive daydreaming scale would be included. To further identify participants who have AF, participants who indicated "yes" on any of the themes related to AF in the Daydreaming themes and Content questionnaire (refer to Materials section) would be categorised as people with MD-AF. Given that MD was often presented alongside other mental health difficulties (Soffer-dudek & Somer, 2018), people with co-morbid mental health difficulties were also included.

A total of 148 participants responded to the recruitment advert. 18 participants withdrew from the study. Also, only participants who identified aversive themes in their daydreams were included; therefore, 14 participants were further excluded. The final sample (Table 1) consisted of 116 participants (84 Female) who were all aged 18 or above (the mean age of the group *M*=26 and with a range of 18 to 51), fluent in written English and predominantly white (77%). Over half of the sample were in employment (51.5%), with most of them with education levels at diploma or above (49.1%) and were experiencing other mental health difficulties that they were in treatment for (50%).

Materials

The online questionnaire consisted of seven self-reported psychometric scales, as detailed below (refer to Appendix E for the digital copy).

The Maladaptive Daydreaming Scale (MDS-16)

The MDS-16 (Somer et al., 2016a) is a 16-item scale measuring the presence and severity of MD in terms of frequency, the appeal and intense craving for daydreaming activity, the physical movements that accompany daydreaming and the impairments on well-being. It is rated on a 10-point Likert scale (0 “Never” to 100 “Extremely Frequent”; scores are in increments of 10). The total score was computed by the sum of item scores divided by 16. A total score of 40 or higher would indicate probable MD (Somer et al., 2016a). Test re-

test reliability in the original scale development study is *r*=.92 (Somer et al., 2016a), The internal consistency in the present study is α =.84.

Daydreaming Themes and Content Questionnaire (DCFQ)

The DCFQ (Somer et al., 2021) is a 17-item binary-coded questionnaire investigating the contents and functions of an individual's daydream in MD. It is acknowledged that isolating the themes of daydreams would be challenging due to the complexity of one's fantasies. Therefore, after consulting with the author of the scale, the scale was used to identify groups of PwMD who also employ themes that fall within the category of AF (i.e. death, emotional suffering, physical violence as a victim, being a captor, being rescued or the rescuer; E. Somer, personal communication, December 22, 2023). It has a good level of concurrent validity as it was developed based on the qualitative literature in MD (Somer et al., 2021). The internal consistency in the present study is α =.81.

The Difficulties in Emotion Regulation Scale (DERS)

The DERS (Gratz & Roemer, 2004) is a 36-item scale measuring individuals' difficulty in regulating emotions. It consists of six subscales: non-acceptance of emotional responses, difficulty engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies and lack of emotional clarity. It is measured on a 5-point Likert scale, from (1 “rarely” to 5 “almost always”). A high score indicates more difficulties regulating emotions. The scale was reported to have good internal consistency and good construct and predictive validity in the original study (Gratz & Roemer, 2004). The internal consistency in the current study was α =.93.

The Psychache Scale (PAS)

The PAS (Holden et al., 2001) is a 13-item scale measuring the subjective experience of psychological pain based on the definition of Psychache coined by Shneidman (1993). Items are scored on a 5-point Likert scale, with the first nine items measuring the frequency

of the respondents' experiences (1 "never" to 5 "always") and the last four items measuring how strongly they agree or disagree with the described experience (1 "strongly disagree" to 5 "strongly agree"). The scale was reported to have good validity and reliability (α = .94; Holden et al., 2001). The internal consistency of this scale in the current study was α =.93.

The Benign Masochism Scale (BMS)

The BMS (Rozin et al., 2013) is a 26-item questionnaire measuring benign masochism by asking individuals to rate their liking of the 26 masochistic behaviours in seven clusters (sad, burn, disgust, fear, pain, exhaust, alcohol and bitter), by giving a score on a scale of zero to 100. The scale was reported to have good construct validity and reliability (Greitemeyer & Sagioglou, 2021; Rozin et al., 2013; Spoor & Hormes, 2024). The internal consistency of the scale in the current study was α=.80.

The Avoidance Motivated Response to Anger Scale (AMRAS)

The AMRAS (Szymaniak et al., 2022) is a five-item questionnaire measuring individuals' trait anger avoidance on items such as "*when I get angry, I avoid the person or situation that made me angry*". Items are measured on a five-point Likert scale, ranging from 1("extremely uncharacteristic of me") to 5 ("extremely characteristics of me"). It was reported with good internal consistency and good convergent validity r= .31 (Szymaniak et al., 2022). The internal consistency of the scale in the current study was α=.78.

The Traumatic Antecedents Questionnaire (TAQ)

The TAQ (Luxenberg et al., 2001) is a 40-item self-report questionnaire exploring childhood traumatic experiences in four developmental periods (0-6; 7-12; 13-18 years and adulthood). There are ten sub-scales included in the questionnaire (competence, safety, neglect, separation, emotional, physical and sexual abuse, witnessing traumatic events, alcohol, drugs and other traumas. It was reported with good internal consistency and convergent validity (Park et al., 2020). As the current study aimed at exploring adverse

experiences, the safety and competence subscales were not examined, as suggested in the previous study (Sándor et al., 2023b). Moreover, as the current study focused on the experience of traumatic life events at any time point in life, a global score of the eight scales (neglect, separation, emotional abuse, physical abuse/ assault, sexual abuse/assault, witnessing, other trauma, and alcohol and drugs) was calculated. The subscale score was calculated by the sum of all non-zero scores from that age period divided by the number of non-zero items. The global score was then calculated as the sum of all the eight sub-scale scores across age groups. The internal consistency of the scales in the present study across developmental stages were α=.86 (0-6), .87 (7-12), .86 (13-18) and .85 (Adult).

Demographic questionnaire

Participants were asked to complete a demographic questionnaire in the end, which asked about their age, gender, ethnicity, occupation, education level and if they have any current mental health difficulties for which they were currently in treatment.

Procedure and Ethical Considerations

This study was granted by the ethics review board of Salomons Institute for Applied Psychology (Ethics approval number: ETH-2333-0126; Appendix D). This study was also in line with the values of the National Health Service in the UK (Department of Health and Social Care, 2023), in terms of compassion (e.g. making the voice of PwMD heard) and improving lives (e.g. exploring potential targets for treatments). The poster (See Appendix F) included summarised details about the study, the inclusion criteria, and a hyperlink, which directed the participants to a detailed participant information sheet and consent form (Appendix G). The participant information sheet included specific details of the study, the possible risks and disadvantages of participating, the confidentiality arrangement, and information for further support. Participants were also informed that their participation was completely voluntary and had the right to withdraw without providing specific reasons.

Moreover, participants were also informed of the potential of experiencing distress by answering questions that were related to their early life experiences of trauma. They were encouraged to seek support from health professionals should they feel overwhelmed by the questions. As the study recruited participants worldwide and was underpinned by the code of ethics in the UK, it was practically impossible to provide information on medical services local to potential participants outside of the UK. Participants were, therefore, asked to indicate in the consent form that they have the contact details of their local health agencies and would be able to seek support from them. After providing their consent, the participants completed the questionnaires. At the end of the study, participants were given the opportunity to indicate if they would like to participate in a prize draw for two £50 Amazon vouchers and to receive a summary of the study outcome. Participants were asked to provide their email address if they agreed to participate in the prize draw. Their contact details were kept separately and deleted once the prize draw was completed, and the outcome report (Appendix H) was sent.

Statistical Analysis

IBM SPSS Statistics (Ver 29) was used for the data cleaning and analyses of the study, which included descriptive statistics, correlational analyses, hierarchical regression and mediation analysis. The total scores were calculated for MDS-16, DERS, the psychache scale, BMS, AMRAS, and TAQ. Descriptive statistics were used to explore the demographic information of the sample and the mean and standard deviations of scale total scores. Boxplots were also used to detect extreme scores on each scale. The reliability score of the scales above was calculated using Cronbach's Alpha, and $\alpha >= .70$ was deemed to be acceptable (Kline, 2013). Pearson's R coefficients were also presented in a correlational matrix to test for potential multicollinearity.

Tests of the normal distribution of each scale score were conducted using the Shapiro-Wilks test, which indicated that total scores of MDS-16 (W=.07, p=<.01), and AMARAS (W=.07, p=<.01) were non-normally distributed. Although the assumption of normal distribution was not influential in regression analyses (Schmidt & Finan, 2018), this study adopted the robust approach of bootstrapping to estimate 95% percentile confidence intervals and significance levels based on a bootstrapped sample of 5000 for the hierarchical regression and mediation analyses (Process Macro; Hayes, 2022), as they do not rely on the assumption of homoscedasticity and the normality of the distribution of the data (Field, 2017, P.567). For the hierarchical regression analysis, the independent variables were entered in the model in the following order: co-variates (age, gender, and exposure to traumatic life experiences) in the first step, the total scores of DERS and AMRAS in step two and three respectively, and lastly, the total score of the BM scale in step four. For the mediation analysis, the PROCESS Macro was used to perform the mediation analysis based on a bootstrapping approach (ver 4.3.1, Hayes, 2022). The sum of eight subscale scores of TAQ was added as the independent variable and the total score of MDS-16 as the dependent variable while the total score of psychache scale was added as the mediator of the analysis.

Given that MD were more frequently reported in younger populations and with mixed results in terms of the difference in its prevalence among genders (Soffer-Dudek & Theodor-Katz, 2022), age and gender were added as the covariates in both models. Also, as trauma exposure was a previously known factor associated with MD and associated with ED in non-MD samples (Berfield et al, 2020), it was added as a covariate in step one of the hierarchical regression model.

The study aimed at recruiting a minimum of 115 participants for the study. Effect size estimates were based on existing research that reported MD's association with trauma exposure (r=.12; Musetti et al., 2023) and emotional dysregulation (r=.41; West & Somer,

2020). However, BM, AA and psychological pain have not been measured previously in MD literature. Therefore, their effect sizes were unclear. For the hierarchical regression model, the G Power software (Ver 3.1; Faul et al., 2007) was used to calculate the sample size required. For an estimated medium effect size of .15 (Cohen, 1988) on all three factors, a minimum of 60 participants would be required to attain a statistical power of .80. Similarly, for the regression model with one mediator, a small to medium (H) effect size (.26) and a medium (M) effect size (.39) were estimated (Fritz & Mackinnon; 2007), which suggested that a minimum of 115 participants was required to attain a statistical power of .80.

Missing Data

There were over 20% of participants (*n*=25) who preferred not to disclose their age and were subsequently treated as missing data. However, as age was expected to be a co-variate for the analyses, a list-wise deletion based on the missing data in age would result in a substantial reduction in the sample size from 116 to 91. Therefore, to address the possible non-response bias, an imputation was conducted using the expectation-maximisation (EM) method (Mayer et al., 2012). Although such imputation method might be impacted by the non-normal distribution of the data, transformations to improve the distribution of the data before imputation might incur further biases in the outcome (von Hippel, 2013). Therefore, this study conducted the imputation of missing data in age without transformations. To ensure the robustness of this change, a sensitivity analysis was conducted by repeating the main analyses with the smaller sample (*n*=91) to compare with the outcome from the wider sample. Any noticeable differences between the two analyses would be addressed in the results section.

Results

Descriptive Statistics

The mean and SD of the total scores of the measures and the correlations between measures were presented in Table 2**.** The mean score of the MDS-16 was above the cut-off score of 40 (*M*=68.58), which indicated MD and the experience of associated distress from MD. The MDS-16 mean score was also comparable to other studies which recruited larger sample sizes from similar online platforms (Ferrante et al., 2022; Somer et al., 2021). Correlation analysis between six scale scores suggested no issues with multicollinearity, as none of the between-measures correlation coefficients were above .80 (Field, 2017).

	N	%	*M (SD)*
Total	116	100	
Age			
18 or above	91	78.45	26 (7.96)
Prefer not to say	25	21.55	
Gender			
Male	22	19	
Female	84	72.4	
Non-binary	10	8.6	
Ethnicity			
White	77	66.4	
Black	8	6.9	
Asian	15	12.9	
Mixed	4	3.4	
Prefer not to say	1	9	
Others	11	9.5	
Education			
Secondary School	11	9.5	
High School	31	26.7	
Diploma or Degree	57	49.1	
Master or above	17	14.7	

	N	%	*M (SD)*
Occupation			
Employed	57	49.1	
Unemployed	49	42.2	
Prefer not to say	10	8.6	
In treatment for other mental health conditions			
Yes	58	50	
No	45	38.8	
Prefer not to say	13	11.2	

Note. N = number of participants; *M* = Mean; *SD* = Standard deviation

Table 2

Means, SDs, Correlation Coefficients and 95% Bootstrap CI of Variables.

Variable	M	SD	1	2	3	4	5	6
1. TAQ	37.96	20.53	-					
2. DERS	102.84	21.52	.266** [.080, .438]	-				
3. AMRAS	19.7	4.13	.024 [-.156, .202]	.243** [.104, .378]	-			
4. BM	88.61	32.23	.234** [.048, .409]	-.034 [-.234, .167]	-.007 [-.174, .155]	-		
5. PS	37.94	11.47	.314*** [.093, .475]	.634*** [.523, .726]	.194* [.035, .353]	.035 [-.154, .]	-	
6. MDS	68.58	14.05	.179* [-.003, .340]	.376*** [.219, .518]	.143 [-.029, .316]	.038 [-.112, .184]	.468*** [.324, .595]	-

Note. MDS = Maladaptive Daydreaming Scale; TAQ = Trauma Antecedents Questionnaire; PS= Psyache Scale; BM = Benign Masochism Scale; AMRAS=Avoidance Motivated Response to Anger Scale. 95% Bootstrapped CI presented in parenthesis based on 5000 bootstrapped sample. *M* = mean, *SD* = standard deviation. * $p < .05$ ** $p < .01$ ***$p < .001$

Hypotheses Testing

In terms of H_1, the results (table 3) suggested ED was found to be a statistically significant predictor of MD (*b*=.195, SE=.064, *p*=.003, 95% Bootstrapped CI [.067, .318]). The regression model with the total score of DERS added with co-variates was found to be significant F(4,111) = 6.82, *p*=<.001, accounting for 17% of variance in MD. Also, the R^2 change of .083 (*p*<.001) suggested that the addition of ED on top of the co-variates could explain the additional 8.3% of variance in MD. Anger avoidance was added in the next step of the hierarchical regression model in addition to DERS and the co-variates. Results suggested that the association between anger avoidance and MD was insignificant (*b*=.501, SE=.302, *p*=.096, 95% Bootstrapped CI [-.071, 1.11]). Although the regression model with anger avoidance added in addition to ED, age, gender, and trauma exposure was found to be significant F(5,115) = 6.10, *p*=<.001, the R^2 change of .02 (*p*=.096) suggested that adding anger avoidance could not account for the variance of MD in addition to ED and other co-variates. Therefore, the hypothesis 1 was partially supported.

In the sensitivity analysis where the hierarchical regression analysis was repeated with the imputed age removed (*n*=91; Appendix F), a noticeable difference was reported when the total score of AMRAS was added in step three of the regression model. Results suggested that the AA was positively associated with MD-AF (*b*=.726, *p*=.032, 95% bootstrapped CI [.092, 1.43]). The addition of AA also accounted for an additional 4.1% of variance in MD-AF (*p*=.036). Yet, given the reduction in sample size which could potentially restrict the statistical power, this outcome should be interpreted with caution.

Regarding H_2, the total score of benign masochism was added in step 4 of the hierarchical regression model as stated above. The regression model was reported to be statistically significant in accounting for 18% of variance in MD (F(6, 115) = 5.20, *p*<.001). However, the association between BM and MD was statistically insignificant (*b*=.033,

SE=.037, p=.366, 95% Bootstrapped CI [-.042, .107]), with the confidence interval surpassing zero. Also, the increase in the variance of MD explained by the addition of BM was statistically insignificant (R^2 change = .005, p=.340). The sensitivity analysis also yielded no noticeable differences with imputed age removed from the analysis. Therefore, H_2 was not supported.

Table 3.

Summary for The Hierarchical Regression Model Controlling for Age, Gender and Trauma Exposure.

	Step 1			Step 2			Step 3			Step 4		
	b [95% CI]	*B*	*SE*	*b* [95% CI]	*B*	*SE*	*b* [95% CI]	*B*	*SE*	*b* [95% CI]	*B*	*SE*
Age	-.594** [-1.21, -2.31]	-.302	.196	-.566** [-.953, -.249]	-.288	.178	-.570^{ns} [-.950, -.253]	-.290	.177	-.588** [-.969, -.271]	-.299	.177
Gender	1.05^{ns} [-3.38, 5.82]	.038	2.27	1.40^{ns} [-2.84, 8.87]	.051	2.19	1.34^{ns} [-2.87, 5.73]	.049	2.17	1.54^{ns} [-2.43, 5.80]	.057	2.10
TAQ	.133* [.003, .251]	.195	.062	.078^{ns} [-.066, .205]	.114	.070	.086^{ns} [-.057, .210]	.126	.069	.073^{ns} [-.084, .200]	.106	.074
DERS	-	-	-	.195** [.067, .318]	.298	.064	.166* [.090, .299]	.255	.068	.170* [.033, .308]	.261	.070
AMRAS	-	-	-	-	-	-	.501^{ns} [-.071, 1.11]	.147	.302	.501^{ns} [-.067, 1.11]	.147	.300
BMS	-	-	-	-	-	-	-	-	-	.033^{ns} [-.042, .107]	.076	.037
F	4.84***			6.82***			6.10***			5.20***		
Δ R^2	.091			.168			.182			.180		
R^2 change	.115**			.083***			.020^{ns}			.005^{ns}		

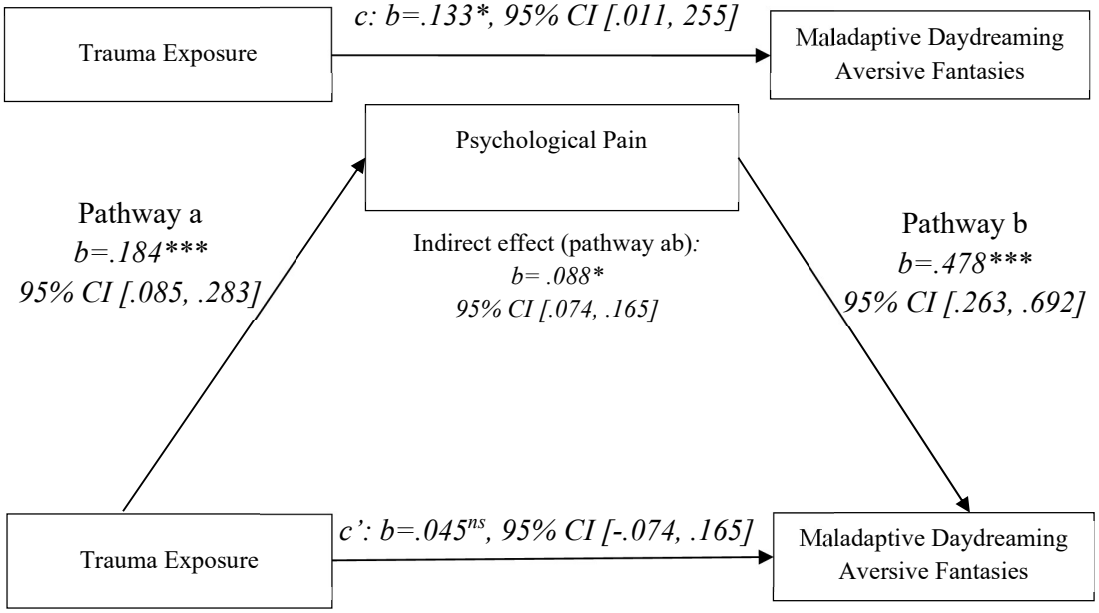
Note. TAQ = Trauma antecedents' questionnaire; DERS = Difficulties in regulating emotions scale; PS= Psychache Scale; AMRAS = Avoidance motivated response to anger scale; BMS: Benign Masochism Scale; *b*= unstandardised beta; *B*=standardised beta; *SE*=standard error; Δ R^2 = adjusted R-squared; R^2 change = R-squared change; 95% CI = 95% bootstrapped confidence intervals based on 5000 bootstrapped samples. * p<.05 ** p<.01 *** p<.001 ^{ns} non-significance

H_3 was tested by exploring the "total effect" of trauma exposure on MD in people with MD-AF within the mediation regression model for H_4. As described in Figure 3 below, the results from the mediation model suggested that in people with MD-AF, exposure to trauma across life stages (i.e. higher TAQ scores) was significantly associated with a higher level of MD (i.e. higher MDS-16 scores) in PwMD with AF, with the positive bootstrapped confidence intervals not surpassing zero (*b*=.133*, p*=.032*,* 95% bootstrapped CI [.011, .255]). The results also suggested that exposure to traumatic experience across life stages accounted for 11% of variance in the MD severity with age and gender control, in people with MD-AF ($F(3,112)=4.84$, $p=.003$) . Therefore, H_3 was supported by a significant positive statistical association between trauma exposure and MD-AF.

Regarding H_4, the results from the mediation analysis suggested there was a statistically significant indirect effect of psychological pain on the association between trauma exposure across life stages and MD-AF, with the bootstrapped confidence intervals not surpassing zero (*b*=.088, 95% CI [.027, .166]). The direct effect between trauma exposure and MD (indicated as *c'* in Figure 3) was no longer significant (*b*=.045, *p*=.454, 95% CI [-.074, .165]), which suggested that the association between trauma exposure and MD was fully mediated by PP. This indicated that, though the effect size was small, the association between a higher level of exposure to trauma experience in life and a higher level of MD intensity and severity could be explained by a higher level of PP. The sensitivity analysis also yielded no noticeable differences. Therefore, H_4 was supported.

Figure 3.

The Mediation Model of Psychological Pain in the Association between Exposure to Trauma and MD, in PwMD who engaged in AF.



Note. Age and gender were entered as co-variates. c'= total effect of trauma exposure on MD-AF, c= the direct effect of trauma exposure when the indirect effect was accounted for. *b* = unstandardised beta**.** CI= 95% confidence intervals based on a bootstrapped sample of 5000. *p<.05, **p<.01, ***p<.001 ^{ns} non-significant

Subsequent Analyses

To explore the differences in the influence of ED and AA in predicting MD the analysis for H_1 was repeated with AMRAS added in the second step and DERS added in the third step (Appendix J),. The regression model with AA added first was significant (F(4,111) = 5.36, p=<.001), explaining 13% of variance in MD. AA was found to be statistically significant in predicting MD (b=.739, SE=.290, p=.010, 95% Bootstrapped CI [.182, 1.32]). The inclusion of AA accounted for 4.7% variance in the MD for people with MD-AF (R^2 change =.047, p=.014). When ED was added in step three, the inclusion of ED accounted for

an additional 5% of variance in MD on top of AA (R^2 change =.055, p=.006). However, the corresponding regression coefficients of AA on MD were no longer significant, as reported in the main analysis.

Given that the data was only collected at a single time point, this study questioned if there is a bi-directional effect between MD-AF and psychological pain, in that engagement in MD-AF would also predict a higher level of psychological pain. Therefore, a hierarchical regression model with the total score of MDS-16 as the independent variable and the total score of psychological pain as the dependent variable was conducted, with age, gender and trauma exposure controlled as the co-variate. The results suggested that MD was positively associated with a higher level of psychological pain (b=.313, SE=.074, p<.001, 95% Bootstrapped CI [.174, .458]). MD-AF also accounted for an additional 13% variance in psychological pain in addition to the impact of age, gender, and exposure to trauma (p<.001).

Discussion

The current study explored factors associated with the experience of AF in MD, with specific hypotheses to explore associations among ED, AA and MD in an MD-AF-specific sample. The association between BM and MD-AF was also explored. Moreover, the association between trauma exposure and MD-AF and the possible mediating effect of PP on such relationships were explored.

Results supported H_1 that ED was positively associated with MD in the people with MD-AF. This finding was consistent with the existing evidence in the wider MD sample (Greene et al., 2020; Pyszkowska et al., 2023; Sándor et al., 2023a; Thompson, 2019). In other words, PwMD who struggle with managing their emotions in distressing situations in real life (e.g. lacking emotional awareness and clarity, having insufficient strategies to regulate their emotions) might choose to use MD-AF as a coping strategy for momentary relief (Dujić et al., 2020).

Insignificant results were reported when AA was added in the regression model after ED. A possible explanation could be that the DERS items covering the wider aspects of emotional regulation might have covered part of the specific avoidant responses to anger in AMRAS. Indeed, this was supported by the statistically significant results in the subsequent analysis where AA was added before ED – that AA might be a type of emotional regulation strategy for anger in people with MD-AF. In other words, people with MD-AF might have a higher tendency to avoid anger in real life (e.g. "When I get angry, I avoid the person or situation that made me angry"; Szymaniak et al. 2022, p.302), and access them in daydreams as proposed by Lucas (2021). Moreover, evidence in the non-MD population supported the use of experiential avoidance as a coping strategy when individuals experience difficulties in managing distressing emotions (Boulanger et al. 2010; Di Giuseppe & Taylor, 2021). However, the finding in this study is insufficient to indicate whether people used MD-AF to specifically enact the anger that they have avoided in real-life. Nonetheless, the outcome provided additional evidence to support the notion of deficits in emotional regulation and experiential avoidance in PwMD with AF.

The statistically insignificant association between BM and MD-AF in H_2 was unexpected, as this mechanism of hedonic reversal was proposed previously to explain this simultaneous activation of pain and pleasure in AF (Lucas, 2021; Somer et al., 2016c). Whilst this might be due to the incompatibility of the theory of BM with AF, this might be attributed to the measurement tool of BM. The BMS (Rozin et al., 2013) was developed to measure participants' preferences on 26 items (e.g. sad movies, painful massage, eye tearing), to explore whether individuals' preference for these painful and aversive activities could reflect BM. Although the countries of origin of the participants in this study were not directly explored, our sample was expected to have included participants with varied cultural backgrounds as participants were recruited via online communities. Given that the items were

initially developed based on samples from the US, participants' cultural background might influence their interpretations and ratings on those items, as suggested in a non-MD sample (Spoor & Hormes, 2024). Therefore, while the outcome of the analyses suggested no significant association between BM and MD, there was insufficient evidence to reject the role of BM in MD.

The findings from H_3 suggested that a higher level of exposure to traumatic experiences was associated with a higher level of MD-AF, which was consistent with findings from previous studies (Musetti et al., 2021; Somer et al., 2016b). However, given that the analyses were not conducted separately with specific types of trauma exposure, we could only conclude that our participants who engaged in MD-AF experienced trauma across life stages. Nonetheless, results also suggested PP statistically mediated such a relationship. In other words, the experiences of traumatic life experiences were positively associated with the experiences of a higher level of psychological pain, which then further led to a higher level of intensity and frequency of MD in MD-AF samples. The experience of traumatic life events (e.g. loss of loved ones, being a victim of emotional and physical abuse and neglect) could symbolise a sense of loss in something (e.g. psychological safety) or someone of importance, which then lead to intolerable and unpleasant negative emotions (i.e. psychological pain; Meerwijk & Weiss, 2011). People with MD-AF who have an innate capacity to engage in vivid fantasies (Somer et al. 2016b), might make use of this dissociate and absorptive state to escape and distract from these unpleasant and painful emotions (Schimmenti et al., 2019), as explained by the positive association between psychological pain and MD-AF which was consistent with previous findings (Somer et al., 2021).

It was notable that this function of MD in regulating psychological pain was presented in the sample of the current study with people who engage in AF. Although the specific explanation of the use of these intricate, dark, and affect-laden fantasies to regulate

psychological pain remains speculative, the insignificant findings between BM and MD-AF might indicate that the process of deliberately inducing emotional suffering and pain through their fantasies to regulate negative emotions caused by traumatic experiences might be seen as a sub-type of non-physical, non-suicidal self-injury. They might be considered as serving the purpose of achieving a sense of being in control and mastering one's feelings and emotions, as suggested in a previous review of non-suicidal self-injuries in non-MD samples (Edmondson et al., 2016). However, this was not directly measured in the present study and would require further investigations in future studies on MD-AF.

The subsequent analysis with MD as the statistical predictor of psychological pain in PwMD with AF also indicated an important psychological impact of MD to consider. While MD-AF might serve the function of regulating painful emotions during the daydream, the impact of MD had on their lives might also contribute to the formation of "frustrated psychological need" (P.248, Shneidman, 1998; Shneidman, 1993). This could stem from the painful realisation of the difference between desirable scenarios as portrayed in one's fantasy and reality. Drawing on the previous review on the preconditions of self-harm (Meerwijk & Weiss, 2011), PwMD's difficulties in withholding their urges to daydream might be seen as the difficulties or barriers to avoiding the undesirable situations (e.g. seeing the impact of MD in their social and personal lives). Engaging in this vicious cycle between psychological pain and MD could potentially lead to a sense of defeat (Taylor et al., 2009), which could further contribute to the experience of psychological pain and potentially lead to more significant mental health difficulties such as suicidality (Ordóñez-Carrasco et al., 2020). Previous evidence supported that psychological pain is a mediator in the relationship between trauma exposure and further mental health difficulties, such as the increase in suicidal ideation and risk (Passos et al., 2023; Pompili et al., 2022; Zarrati et al., 2019) and non-suicidal self-injuries (Holden et al., 2022) in non-MD populations. Therefore, more recognition and

attention on MD from mental health professions are needed to understand the challenging and complex experiences of PwMD with AF.

Clinical Implications

MD remains a form of mental health difficulty that awaits recognition to become a formal diagnosis to allow assessments and treatments to take place in mental health services around the world. Yet, the extended knowledge built from the current study helped uncover the experiences of individuals who engaged in aversive daydreams. This supported one of the main NHS values regarding "everybody counts" in that the experiences and voices of PwMD were heard and attended to. A psychologically informed formulation can help conceptualise and understand PwMDs' pain and experiences when assessing individuals with MD-AF. Clinicians should also focus on the subjective experiences of emotional pain, which may stem from previous exposure to traumatic events that lead to unmet emotional needs or the experience with MD itself. Previous studies also suggested a plausible association between MD and suicidality (Schimmenti et al., 2019). Given that emotional pain plays an important role in suicidality (Verrocchio et al. 2016), attention should be given to PwMD in working on the risk associated with MD. Yet, with the under-recognition, misdiagnosis and lack of availability in MD treatment which are at the heart of the MD experience (Bershtling & Somer, 2018; Somer et al., 2016b), there are yet to have well-informed mental health services that can be adequate to address the difficulties that PwMD may be experiencing. Therefore, clinical recognition of MD and its sub-categories would be helpful to put forward more comprehensive treatment plans and interventions to be developed.

Existing strategies used to cope with emotions should also be explored. Being able to help PwMD to attune to their internal intolerable states and be aware of their coping strategies would be essential to help manage the severity of MD, as well as prevent more severe outcomes such as suicidality. Emotion-focused therapy (EFT; Greenberg & Elliott,

2002) can be considered a helpful intervention that allows PwMD to express, reprocess, and transform painful core emotional experiences. Experiential techniques, based on EFT protocols on psychological pain (Timulak, 2015), can be used to address psychological pain in particular which could stem from past experiences or the experience with MD (e.g. "shame, loneliness, fear"; p.86). The aim of increasing the flexibility in emotional processing in EFT can potentially help target the avoidant reaction to anger in real-life scenarios for people with MD-AF. This can also be potentially helpful for PwMD with previous exposure to traumatic experiences (Harte et al., 2020). The focus on the interoceptive ability to notice and express one's emotions might also suggest the applicability of mindfulness-based interventions that can help manage the symptoms of MD (Herscu et al., 2023). Given that the motivation to engage in social interactions was previously suggested to be incompatible with MD, interventions that target individuals' interactions with their wider systems, such as systemic family therapy, may be helpful for PwMD to manage difficulty in talking about their experiences with MD and access resources available from close ones.

Limitations

The outcome from the sensitivity analyses with the smaller sample suggested a noticeable difference with the main analysis with the missing age being imputed. While the statistical biases might remain after the imputation, the repeated analysis with the smaller sample might not accurately reflect the outcome of the analysis as it might be underpowered. Although previously established studies in MD successfully recruited large sample sizes through similar channels, it was logistically difficult for the present study to reach enough participants, which might be due to MD-AF being a small sub-group of the wider MD population. Moreover, the present study relied on self-reported measures, which could potentially lead to response biases, such as social desirability bias (Rosenman et al., 2011). It might also be subject to selection bias as the recruitment protocol might have attended to

PwMD who are more proactive, potentially impacting the reliability of the data. The present study also recognised the difficulty in theoretically isolating individuals with MD-AF, due to the complexity of internally constructed fantasy. Future studies attempting to recruit this specific sub-group should consider a mixed method by combining a structured interview that targets the themes exploration of the sample with quantitative measures to identify people with MD-AF more accurately. Also, studies should consider alternative methods to reach and recruit participants who might be older to help broaden the understanding of MD at different age levels.

Future Research

Further studies should consider replicating the associations reported in the current study with a larger sample and potentially comparing the differences between PwMD with or without AF. Also, if applicable, specific trauma types and sub-types of difficulties in regulating emotions in MD-AF should be considered to create more in-depth knowledge regarding the antecedents or associated factors of MD-AF. Also, as mentioned above, future studies should consider alternative methods that are culturally sensitive to measure the construct of benign masochism in MD-AF. Furthermore, to extend the understanding of psychological pain in MD-AF, the association between MD-AF and the experience of non-suicidal self-injuries should also be measured to increase awareness of the further consequential risk of maladaptive daydreaming. Lastly, recent evidence suggests that people with alexithymia (i.e. difficulty in describing or differentiating emotions) might not be experiencing a reduced imagination process but rather more frequent daydreaming, particularly relating to negative emotions (Preece & Gross, 2023). Given that the preliminary finding in this study suggests the potential ability of AF to process challenging emotions avoided in real life, future studies could also consider exploring the association between alexithymia and MD-AF.

Conclusions

The present study provided some additional quantitative evidence to aid the understanding of MD-AF. Findings were consistent with previous studies on the wider MD population, in that emotional dysregulation was associated with MD-AF, and behavioural avoidance of anger might be a specific type of avoidant coping that PwMD with AF engage in. Although the insignificant relationship between benign masochism and VF might be explained by the cultural influences on the individuals' preferences for the listed activities, such an insignificant relationship might also suggest a plausible property of MD-AF as a form of indirect self-harm. Additionally, previous exposure to trauma appeared to be associated with the more frequent and intense use of MD-AF, and this relationship could be explained by a high level of psychological pain. Subsequent analysis also revealed that MD-AF also statistically predicted a higher level of psychological pain, which provided additional support to the psychological impact of engaging in this complex and intricate daydreaming experience. The aforementioned outcomes called for better recognition of MD and training for clinicians to better identify and understand the complexity of MD-AF. Moreover, the therapeutic approaches that target assisting PwMD to explore and approach challenging emotions and memories might be helpful for them to gain more adaptive coping strategies to deal with times of distress. Future studies should attempt to replicate the current study with a larger sample and consider incorporating semi-structured interviews to more accurately identify people with MD-AF. More in-depth investigations into factors associated with MD-AF such as alexithymia to deepen the understanding of this intricate and powerful internal imaginative experience are also warranted.

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Appendix A

Appraisal Tool for Cross-Sectional Studies (AXIS)

Questions	Chu et al., 2018	Chu et. al. 2016	McCreery & Krach, 2018
1. Were the aims/ objectives of the study clear	Yes	Yes	yes
2. Was the study design appropriate for the stated aims?	Yes	Yes	yes
3. Was the sample size justified?	Yes	Yes	yes
4. Was the target/ reference population clearly defined?	Yes	No	yes
5. Was the sample frame taken from an appropriate population base so that it closely represented the target/ reference population under investigation?	Yes	No	yes
6. Was the selection process likely to select subjects/ participants that were representative of the target/ reference population under investigation?	Yes	No	yes
7. Were measures undertaken to address and categorise non-responders?	No	No	yes
8. Were the risk factors and outcome variables measured appropriate to the aims of the study?	Yes	Yes	yes
9. Were the risk factors and outcome variables measured correctly using instruments/ measurements that had been trialled, piloted or published previously?	Don't Know - Violent daydreams were measured using a	Don't know - Violent daydreams were measured using a	yes

	proxy measure.	proxy measure.	
10. Is it clear what was used to determine statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)	Yes	Yes	yes
11. Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	Yes	Yes	yes
12. Were the basic data adequately described?	Yes	Yes	yes
13. Does the response rate raise concerns about non-response bias?	No	No	No
14. If appropriate, was information about non-responders described?	No	No	No
15. Were the results internally consistent?	Yes	Yes	yes
16. Were the results presented for all the analyses described in the methods?	Yes	Yes	yes
17. Were the authors' discussions and conclusions justified by the results?	Yes	Yes	yes
18. Were the limitations of the study discussed?	Yes	Yes	yes
19. Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?	No	No	No
20. Was ethical approval or consent of participants attained?	Yes	Yes	yes

Appraisal Tool for Cross-Sectional Studies (AXIS) Continued

Questions	Nagtegaal et al. 2006	Selby et al. 2007	Smith et. al. 2009
1. Were the aims/ objectives of the study clear	Yes	Yes	Yes
2. Was the study design appropriate for the stated aims?	Yes	Yes	Yes
3. Was the sample size justified?	No	No	No
4. Was the target/ reference population clearly defined?	No	No	Yes
5. Was the sample frame taken from an appropriate population base so that it closely represented the target/ reference population under investigation?	No	Yes	Yes
6. Was the selection process likely to select subjects/ participants that were representative of the target/ reference population under investigation?	Yes	Yes	Yes
7. Were measures undertaken to address and categorise non-responders?	Don't know	No	No
8. Were the risk factors and outcome variables measured appropriate to the aims of the study?	Yes	Yes	No
9. Were the risk factors and outcome variables measured correctly using instruments/ measurements that had been trialled, piloted or published previously?	Yes	Yes	Yes
10. Is it clear what was used to determine statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)	Yes	Yes	Yes

11. Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	Yes	Yes	Yes
12. Were the basic data adequately described?	Yes	Yes	Yes
13. Does the response rate raise concerns about non-response bias?	No	No	No
14. If appropriate, was information about non-responders described?	No	N/A	N/A
15. Were the results internally consistent?	Yes	Yes	Don't know The CFI subscales were reported low internal consistency, even after adjustment.
16. Were the results presented for all the analyses described in the methods?	Yes	Yes	Yes
17. Were the authors' discussions and conclusions justified by the results?	Yes	Yes	Yes
18. Were the limitations of the study discussed?	Yes	Yes	Yes
19. Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?	No	No	No
20. Was ethical approval or consent of participants attained?	Yes	Yes	Yes

Appraisal Tool for Cross-Sectional Studies (AXIS) Continued

Questions	Watt, Begelhole & Guse, 2010	Watt & Allard, 2010	Watt et al. 2013
1. Were the aims/ objectives of the study clear	Yes		Yes
2. Was the study design appropriate for the stated aims?	Yes		Yes
3. Was the sample size justified?	No	No	Yes
4. Was the target/ reference population clearly defined?	Yes	No	Yes
5. Was the sample frame taken from an appropriate population base so that it closely represented the target/ reference population under investigation?	Yes	No	Yes
6. Was the selection process likely to select subjects/ participants that were representative of the target/ reference population under investigation?	Yes	No	Yes
7. Were measures undertaken to address and categorise non-responders?	No	No	Yes
8. Were the risk factors and outcome variables measured appropriate to the aims of the study?	Yes	Yes	Yes
9. Were the risk factors and outcome variables measured correctly using instruments/ measurements that had been trialled, piloted or published previously?	Maybe. The SIV was calculated as a total score, which	No. Four items were added to the SIV but no details of	Yes

	was not recommended in other studies (Grisso et al. 2000)	the items were provided. Also, they calculated the score with seven items.	
10. Is it clear what was used to determine statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)	Yes	Yes	Yes
11. Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	Yes	Yes	Yes
12. Were the basic data adequately described?	Yes	Yes	Yes
13. Does the response rate raise concerns about non-response bias?	No	No	No
14. If appropriate, was information about non-responders described?	No	No	N/A
15. Were the results internally consistent?	Yes	Yes	Yes
16. Were the results presented for all the analyses described in the methods?	Yes	Yes	Yes
17. Were the authors' discussions and conclusions justified by the results?	Yes	Yes	Yes
18. Were the limitations of the study discussed?	Yes	Yes	Yes
19. Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?	No	No	No
20. Was ethical approval or consent of participants attained?	Yes	Yes	Yes

Appendix B

Appraisal Tool for Cohort Studies (CASP Checklist For Cohort Studies)

Questions	Hardin et al., 2022	Guerra, Huesmann & Spindler, 2003
1. Did the study address a clearly focused issue?	Yes	Yes
2. Was the cohort recruited in an acceptable way?	Can't tell. The data was acquired from an existing dataset from a wider study, which could indicate bias.	Yes
3. Was the exposure accurately measured to minimise bias?	Yes	Yes
4. Was the outcome accurately measured to minimise bias?	No. The anger rumination construct was derived from another scale used in the study when accessing the pre-existing dataset. Validity of the measure is limited. Also, when the data was collected in the original study, the researchers did not minimise possible confounding factors such as environmental exposure.	Yes
5. (a) Have the authors identified all important confounding factors?	Yes	Yes
5. (b) Have they taken account of the confounding factors in the design and/ or analysis?	Yes	Yes

6. (a) Was the follow up of subjects complete enough?	Yes	Yes
6. (b) Was the follow up of subjects long enough?	Yes	Yes
7. What are the results of this study?	Anger rumination mediated the relationship between anger disposition and violent acts post hospitalisation. The effect was not moderated by imagined violence.	High continuity of aggressive behaviours, aggressive fantasies and normative beliefs about aggression. Exposure to violence was only associated with an increase in aggressive cognition at later school grades.
8. How precise are the results?	As the review was focused on the role of imagined violence, there was a precise reporting of the moderated mediation model with accurate 95% bootstrapped confidence interval.	The study did not report the confidence interval of their analysis. However, subsequent analyses were conducted to explore a detailed relationship of the development of aggressive cognition and aggression and exposure to violence in the community across 6 different school years.
9. Do you believe the results?	Yes	Yes

10. Can the results be applied to the local population?	Unsure. The demographic disposition of the sample might be different to the local UK population.	Yes
11. Do the results of this study fit with other available evidence?	Yes	Yes

Appendix C

Appraisal Tool for Case-Control Studies (CASP checklist for case-control studies)

Questions	Grisso et al., 2000	Moeller et al, 2016	Poon & Wong, 2021
1. Did the study address a clearly focused issue?	Yes	Yes	Yes
2. Did the authors use an appropriate method to answer their question?	Yes	Yes	Yes
3. Were the cases recruited in an acceptable way?	Yes	Yes	Yes. The recruitment rational and procedure was clearly identified
4. Were the controls selected in an acceptable way?	Yes	Can't tell. Controls were not recruited in addition to the cases. They identified the control group by three SIV items.	Can't tell. The controls were allocated randomly from the same pool of participants.
5. Was the exposure accurately measured to minimised bias?	No.	Can't tell. As above	Yes. However, they relied on a self-reported measure to check the effectiveness of the manipulation, which might subject to bias

6. Aside from the experimental intervention, were the groups treated equally? Have the authors taken account of the potential confounding factors in the design and/ or in their analysis?	There was no experimental intervention. However, environmental factors post discharge might influence the outcome measure (aggressive acts) of the study.	No.	Yes.
7. How large was the treatment effect?	Significant difference in VF rates between case group and control group (χ^2=43, p=.0001)	Compared to control group, case group was presented with two times more aggressive acts prospectively in the follow up period (Mann – Whitney U =468).	Case group reported more VF than the control group. t(111)=.477, *p*<.001, 95% CI[.73, 1.78] Case group also reported lower subjective wellbeing than control group. t(111)=-2.71, *p*=.008, 95% CI [-1.71, -.27]
8. How precise was the estimate of the treatment effect?	P value was <.0001	*p* = .030	It was precise with statistical estimate presented above.

9. Do you believe the results?	Yes	Yes	No. not all descriptive statistics regarding the correlation between factors were presented before the mediation analysis was conducted. There was a possible multicollinearity issue.
10. Can the results be applied to the local population?	Can't tell. The demographic disposition of the case and control group might be different to local UK population.	No	Yes
11. Do the results of this study fit with other available evidence?	Yes	Yes	Yes

Appendix D

Ethical Approval

This has been removed from the electronic copy.

Appendix E

Digital Copy of The Questionnaire

This has been removed from the electronic copy.

Appendix F

Study Poster and Advert Post on Reddit and Discord

Hi everyone,

I'm currently doing my doctorate in clinical psychology at Canterbury Christ Church University. I'm promoting my research study aimed at exploring the underlying factors associated with the experience of maladaptive daydreaming (MD) with aversive themes. The aim is to better understand individuals' experiences with MD that involve aversive elements such as pain, death, violence, abuse, and illness. Additionally, this research may help identify potential targets for developing treatments.

This study is open to people who are:

- **Aged 18 or above &**
- **Fluent in Written English &**
- **Have experience with Maladaptive Daydreaming with any themes.**

We are very interested in people with MD with themes that are primarily or exclusively negative/ aversive.

After completing the questionnaire, you will also have the opportunity to enter a raffle **to win one of two £50 Amazon vouchers!** (or equivalent to your local currency)

If you're interested, please refer to the poster attached or follow the link to learn more about the study and sign up: bit.ly/MD_AFNew

Thank you!

P.S. There is a bot-checker at the beginning of the questionnaire.

CHANCES TO WIN A £50 AMAZON VOUCHER!

Canterbury Christ Church University

UNDERLYING FACTORS OF MALAPTIVE DAYDREAMING WITH AVERSIVE THEMES

Research Opportunity

My name is Titian and as part of my Doctorate in clinical psychology, I'm currently conducting a study to explore **factors associated with Maladaptive Daydreaming with Aversive/ Negative Themes (e.g. death, violence, abuse, and illness)**

What will it involve?

You are invited to complete a questionnaire.

The questionnaires will ask questions about **your daydreams, emotions, and early life experiences.** It will take you about **30 minutes to complete.**

Who can take part?

You may qualify if you are:

Aged 18 or Above
Fluent in Written English
Experience with Maladaptive Dreaming

We are very interested in people who are:

Experiencing MD with a theme that is **primarily or exclusively** aversive (e.g., negative feelings, death, violence, abuse, illness, captivity, rescue and escape.)

How do I participate?

Please follow this link: http://bit.ly/MD_AFNew or scan the QR code for more information and participate in the study

This study may not be for you if you find answering multiple choice questions on topics related to trauma, your MD experience, and emotions likely to be distressing.

You will get a chance to win a £50 Amazon Voucher! (2 prizes in total)

For more information, please contact me via tt296@canterbury.ac.uk.

Appendix G

Participant Information Sheet and Consent Form

Salomons Institute for Applied Psychology
One Meadow Road, Tunbridge Wells, Kent TN1 2YG www.canterbury.ac.uk/appliedpsychology

Information about the research

Maladaptive Daydreaming: Exploring the underlying factors attributing to "aversive fantasies".

Lead Researcher: Titian Tam
Principal Supervisor: Dr John McGowan
Secondary Supervisor: Dr Amy Lucas

My name is Titian and I am a trainee clinical psychologist at The Salomon's Institute of Applied Psychology, Canterbury Christ Church University. I would like to invite you to take part in a research study. Before you decide to take part or not, it is important that you understand why this research is being done and what would it involve. Please talk to others about the study if you wish.

What is the purpose of the study?

This study aims at exploring the underlying factors that may contribute to the experience of maladaptive daydreaming in "aversive fantasies" (e.g. death, violence, abuse, and illness). A better understanding of these factors may help investigate the potential reasons that could explain this specific type of daydreaming and identify potential targets to develop psychological treatments.

Why have I been invited?

You are being invited to this study as you have responded to the online advertisement looking for individuals who believe that they experience "maladaptive daydreaming". You will now be asked filled in some questionnaires related to this to determine if you meet the eligibility criteria for this research.

Do I have to take part?

It is up to you to decide whether to join the study or not. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw before 15th January, 2024 without giving a reason, after which we will analyse the data and write up the research report. However, we can only withdraw your answers if we can identify them e.g., by using the email address you have entered for further contact. Please refer to the section below for more information about the process of this study.

What will happen to me if I take part?

You will be asked to complete a questionnaire which will ask you about your experience with MD, the themes of your daydreams, emotions and early life experiences. We will also ask you for some information about you such as your age and ethnicity. This is to help us find out if the people who responded to the questionnaire are representative of the population as a whole. You will also be asked to provide an email should you wish to join the raffle for the prizes. You are more than welcome to provide an alias email to protect your own confidentiality provided that we can reach you via that email.

Expenses and payments

Upon completion, you can be included in a prize draw for a £50 Amazon e-voucher (2 prizes in total) as gratitude for your participation in this study. If you would like to participate, please provide us with your contact details at the end of the study so we can reach you.

What are the possible disadvantages and risks of taking part?

As the questions in the survey will be asking about your early life, emotions and daydreaming experience, they would potentially make you feel distressed. If you think that answering multiple choice questions on these topics is likely to be overwhelming for you, we'd recommend that you do not participate. You are welcome to take a break from completing the questionnaire if you need to. You also have the right to terminate the study by closing the survey at any point. You can raise any concerns with me by contacting me via the email address stated above.

What are the possible benefits of taking part?

While we cannot guarantee that this research will be able to provide therapeutic benefits for your participation at the moment, your insight and experiences will help us improve the understanding of the complexity of aversive fantasies in maladaptive daydreaming. This may in the future help inform the development of psychological interventions specifically for maladaptive daydreaming.

Will information from or about me from taking part in the study be kept confidential?

All information which is collected from or about you during the research will be kept strictly confidential. The only time shall this confidential agreement be breached is if you have raised any risk regarding potential harm to yourself or others. I will try my best to inform you before passing on your information to a third party to help keep you and others safe. You also have the right to check the accuracy of data held and correct any errors.
This questionnaire is being run on a platform called Gorilla. The details of Gorilla's security can be found here: https://app.gorilla.sc/privacy. Once the questionnaire is complete, all the participants' answer will be downloaded from Gorilla to secure University issued USB. The data will be deleted from Gorilla at the end of the study. Your data will be stored electronically, and password protected. You will also be assigned a participant number for the data collected. We will not ask for your name, date of birth or address. Only members of the research team stated above would have access to the data. As the data collection process is conducted entirely via the online platform, no printed copies will be produced. Data may be used for further studies. Once the prize draw has been completed and result report has been disseminated to all the participants, the email addresses will be deleted. All data will be stored in the possession of Canterbury Christ Church University for 10 years and will be destroyed afterwards. For more information about data protection, please see the university's research privacy notice: https://www.canterbury.ac.uk/university-solicitors-office/docs/research-privacy-notice.docx This privacy notice explains your rights and the legal basis on which we process research data. It also provides contact details in case you have any questions or complaints about how we handle your data.

What will happen to the results of the research study?

The results of the study will be written up as a research report and will be submitted to the Salomons Institute of Applied Psychology as part of my Doctorate in Clinical Psychology training. The report may also be submitted and published in academic journals and be published on the Institute's website. A summary report of the results will also be written up and provided to you once the research process has been completed. The full academic report will also be provided upon request.

What will happen if I don't want to carry on with the study?

If you would like to withdraw from the study you can do so without any reason until 15th January, 2024. You can inform me via email or phone.

Concerns and Complaints

If you have a concern about any aspect of this study, you should ask to speak to me and I will do my best to address your concerns. You can contact me by sending me an email via tt296@canterbury.ac.uk or leaving a message on the 24-hour voicemail phone number 01227 927070. Please leave a contact number and say that the message is for me [Titian Tam] and I will get back to you as soon as possible. If you remain dissatisfied and wish to complain formally, you can do this by contacting Dr Fergal Jones, Clinical Psychology Programme Research Director, Salomons Institute for Applied Psychology: fergal.jones@canterbury.ac.uk

Who is sponsoring and funding the research?

Canterbury Christ Church University is funding the research.

Who has reviewed the study?

All research in the institute is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinions by Salomons Ethics Panel, Salomons Institute for Applied Psychology, Canterbury Christ Church University.

Support

If you are based in the UK and require psychological support, NHS psychological therapies will be available upon request via your GP. If the level of distress is significant, you may wish to speak with your GP about what further support could be helpful, or contact NHS 111, by dialling 111 or using https://111.nhs.uk/. Please be aware that as this is an international project underpinned by the UK ethics, it would be difficult for the current study to provide specific details of local mental health agencies outside of the UK. If you are from other parts of the world, please make yourself aware of local procedures in accessing psychological support before participating in the study and access them should you feel distressed during or after completing the questionnaires. There is unfortunately no evidence-based intervention that is specifically developed for Maladaptive Daydreaming currently.

Version 1.6
Dated: 09/10/2023

Next

Appendix H

Outcome Report

Salomons Institute for Applied Psychology
One Meadow Road, Tunbridge Wells, Kent, TN1 2YG
www.canterbury.ac.uk/appliedpsychology

Project title:
Maladaptive daydreaming: exploring the underlying factors attributing to "aversive fantasies".

Study findings

Project title:

Maladaptive daydreaming: exploring the underlying factors attributing to "aversive fantasies".

Dear study participants,

I'm writing to provide a summary of the study you participated in in 2023. Thanks to your precious time and participation, we were able to collect data from a total of 116 people.

Background:
Maladaptive daydreaming (MD) is an experience where individuals experience significant distress and impact on their daily life function from absorbing and immersing themselves in vivid and perpetual fantasies. Maladaptive daydreaming with aversive fantasies (MD-AF) was first named in 2021 as a plausible specific sub-type of MD, where people with MD would immerse themselves in dark storylines that were often accompanied by painful emotions. This study aimed at exploring other psychological factors that might be associated with this complex experience of pleasure from the agonising emotions in MD.

Method:
This study used a quantitative research method, which made use of several self-reported questionnaires aimed at exploring people's previous exposure to traumatic life experiences, experience with MD, themes and functions of MD, capacity in managing distressing emotions, behavioural responses to anger, and people's preferences on negative experiences (e.g, fear, pain, sadness) that might lead to enjoyment, in people with MD-AF.

Outcomes:
Findings were consistent with the existing literature on MD; that a reduced capacity to manage distressing emotions is associated with the use of MD-AF as a coping mechanism. Specifically, avoiding anger in real life by withdrawing from confrontation, things or people that make people angry might be a specific type of strategy that people with MD-AF engage in. However, people's favour of initially negative activities was not related to the use of aversive fantasies to seek pleasure from the painful emotions experienced in the daydream.

Similarly, people with AF who reported having exposure to previous traumatic experiences also reported more intensive MD and this outcome could be explained by an increase in painful and intolerable emotions from the losses or changes experienced from the traumatic experiences. Further investigation also suggested that engaging in MD-AF could also lead to the experience of more intolerable and painful feelings in real life. However, the underlying mechanism was not directly measured.

Conclusions:
In keeping with previous research, the use of aversive fantasies was seen as a coping mechanism to cope with and manage those painful and tormenting emotions individuals have experienced in real life. However, MD with aversive fantasies might also potentially increase the distress. Practical implications might suggest a need for more comprehensive psychological formulation models to encapsulate the experience of MD, to inform types of treatments that can be helpful to help people with MD to explore, approach, access and manage these challenging emotions.

If you would like to request the full report, you are more than welcome to contact me using the contact details below. I welcome any comments, feedback, questions, or suggestions from you. Additionally, the prize raffle has also been completed, and winners have been notified separately. Following this email, all your contact information will be permanently removed from our records, in line with our commitment to confidentiality and privacy.

Once again, thank you so much for your participation in this study. It was a privilege for me to learn from you all and to be a part of the movement to increase awareness and recognition of this intricate and beautiful experience of maladaptive daydreaming.

Best Regards,
Titian Tam

Trainee Clinical Psychologist
Salomons Institute for Applied Psychology
Canterbury Christ Church University, UK
tt296@canterbury.ac.uk

Supervised by:
Dr Amy Lucas – Clinical Psychologist; President of the International Society for Maladaptive Daydreaming
Dr John McGowan – Clinical Psychologist; Co-Director of the Salomons Institute for Applied Psychology, Canterbury Christ Church University

Appendix I

Model Statistics for Sensitivity Analyses with Imputed Age Removed

Table 1.

Summary for the hierarchical regression model controlling for age, gender, and trauma exposure (n=91).

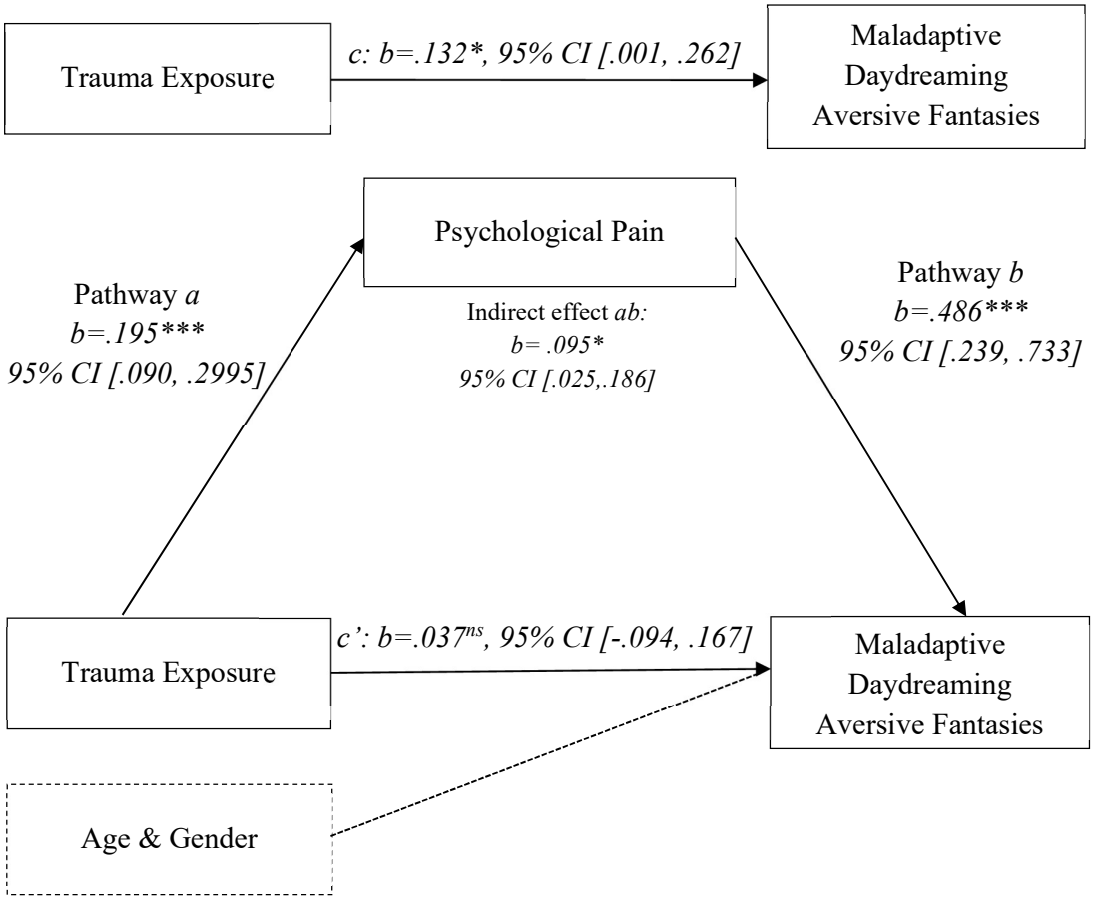
	Step 1			Step 2			Step 3			Step 4		
	b [95% CI] [a]	*B*	*SE*	*b* [95% CI] [a]	*B*	*SE*	*b* [95% CI] [a]	*B*	*SE*	*b* [95% CI] [a]	*B*	*SE*
Age	-.462** [-.851, -.083]	-.267	.193	-.443** [-.809, -.118]	-.256	.176	-.434^{ns} [-.813, -.101]	-.251	.180	-.588* [-.808, -.097]	-.251	.181
Gender	2.49^{ns} [-2.09, 7.36]	.096	2.41	2.99^{ns} [-1.33, 7.56]	.116	2.25	3.18^{ns} [-1.09, 7.74]	.123	2.23	1.54^{ns} [-1.06, 7.70]	.123	2.22
TAQ	.132^{ns} [-.005, .255]	.205	.067	.079^{ns} [-.076, .214]	.124	.074	.086^{ns} [-.062, .212]	.134	.070	.073^{ns} [-.082, .223]	.134	.078
DERS	-	-	-	.193** [.053, 321]	.301	.069	.150^{ns} [-.004, .280]	.234	.066	.150** [-.007, .288]	.235	.075
AMRAS	-	-	-	-	-	-	.726* [.092, 1.43]	.213	.338	.727* [.095, 1.41]	.213	.340
BMS	-	-	-	-	-	-	-	-	-	.033^{ns} [-.095, .090]	.001	.047
F	3.53*			5.13***			5.18***			4.27***		
Δ R^2	.078			.155			.189			.179		
R^2 change	.109*			.084**			.041*			.000		

Note. TAQ = Trauma antecedents' questionnaire; DERS = Difficulties in regulating emotions scale; PS= Psychache Scale; AMRAS = Avoidance motivated response to anger scale; BMS: Benign Masochism Scale; *b*= unstandardised beta; *B*=standardised beta; *SE*=standard error; Δ R^2 = adjusted R-squared. Bootstrapped confidence intervals were based on 5000 bootstrapped samples. * $p<.05$ ** $p<.01$ *** $p<.001$

Model statistics for sensitivity analyses with imputed age removed (con't)

Figure 1.

The total effect between exposure to trauma and MD, in people who engaged in aversive fantasies in MD. the imputation of age was removed (n=91)



Note. c'= total effect of trauma exposure on MD-AF, c= the direct effect of trauma exposure when the indirect effect was considered. b = unstandardised beta**.** 95% CI= 95% confidence intervals based on a bootstrapped sample of 5000. *p<.05, **p<.01, ***p<.001, ^{ns} non-significant

Appendix J

Subsequent Analysis for The Hierarchical Regression Model

Table 1.

Summary for the hierarchical regression model controlling for age, gender, and trauma exposure

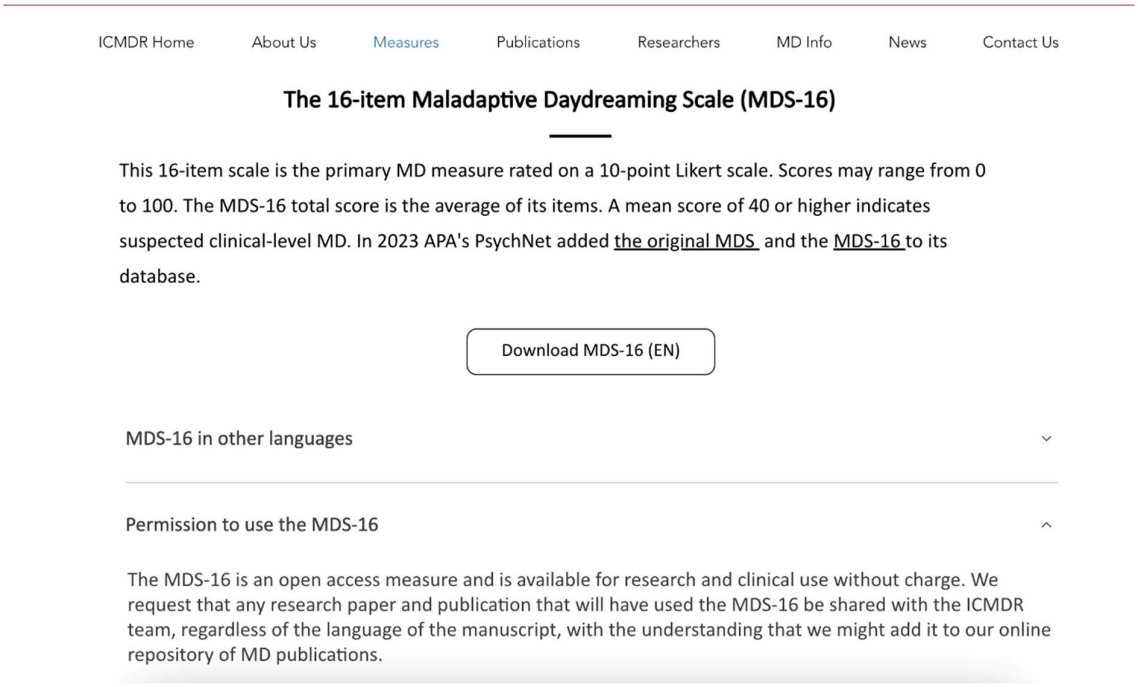
	Step 1			Step 2			Step 3			Step 4		
	b [95% CI] [a]	*B*	*SE*	*b* [95% CI] [a]	*B*	*SE*	*b* [95% CI] [a]	*B*	*SE*	*b* [95% CI] [a]	*B*	*SE*
Age	-.594** [-.983, -.238]	-.302	.191	-.594** [-.972, -.243]	-.302	.186	-.570** [-.932, -.257]	-.290	.174	-.588** [-.950, -.274]	-.299	.173
Gender	1.05 [ns] [-.345, 5.64]	.038	2.28	1.03[ns] [-.350, 5.58]	.038	2.27	.134[ns] [-2.96, 5.75]	.049	2.21	1.54[ns] [-2.61, 5.96]	.057	2.15
TAQ	.133* [.008, .244]	.195	.061	.133* [.010, .241]	.194	.029	.086[ns] [-.055, 2.09]	.125	.067	.073[ns] [-.081, .203]	.106	.072
AMRAS	-	-	-	.739** [.182, 1.32]	.217	.290	.501 [ns] [-.065, 1.11]	.147	.299	.501[ns] [-.066, 1.11]	.147	.297
DERS	-	-	-	-	-	-	.166* [.027, .292]	.255	.067	.170* [.028, .301]	.261	.069
BMS	-	-	-	-	-	-	-	-	-	.033 [ns] [-.042, .108]	.076	.038
F	3.53*			5.13***			5.18***			4.27***		
Δ R^2	.078			.155			.189			.179		
R^2 change	.109*			.084**			.041*			.000		

Note. TAQ = Trauma antecedents' questionnaire; DERS = Difficulties in regulating emotions scale; PS= Psychache Scale; AMRAS = Avoidance motivated response to anger scale; BMS: Benign Masochism Scale; *b*= unstandardised beta; *B*=standardised beta; *SE*=standard error; Δ R^2 = adjusted R-squared. Bootstrapped confidence intervals were based on 5000 bootstrapped samples. * p<.05 ** p<.01 *** p<.001

Appendix K

Permissions to Use the MDS-16 and DCFQ

For MDS-16 and DCFQ:



For other scales including DERS, AMRAS, BMS, psychache and TAQ, no specific copyright agreements are published online regarding the use of their scales. Therefore, the authors of these scales were contacted for their written permission to use respective scales.

Appendix L

Permission to Use the Psychache Scale

This has been removed from the electronic copy.

Appendix M

Permission to Use the AMRAS

This has been removed from the electronic copy.

Appendix N

Permission to Use the BMS

This has been removed from the electronic copy.

Appendix O

Permission to Use the DERS

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Appendix P

Permission to Use the TAQ

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Appendix Q

End of Study Report to Ethics Panel

Salomons Institute for Applied Psychology
One Meadow Road, Tunbridge Wells, Kent, TN1 2YG
www.canterbury.ac.uk/appliedpsychology

Project title:
Maladaptive daydreaming: exploring the underlying factors attributing to "aversive fantasies".

End of Study Report

Dear xxxx,

I'm writing to provide the Salomons ethics review panel with a summary of the study *Maladaptive daydreaming: exploring the underlying factors attributing to "aversive fantasies* that was conducted in 2023-2024.

Background:

Maladaptive daydreaming (MD) is an experience where individuals experience significant distress and impact on their daily life function from absorbing and immersing themselves in vivid and perpetual fantasies. Maladaptive daydreaming with aversive fantasies (MD-AF) was first named in 2021 as a plausible specific sub-type of MD, where people with MD would immerse themselves in dark story lines that was often accompanied by painful emotions. This study aimed at exploring other psychological factors that might be associated with this complex experience of pleasure from the painful emotions in aversive fantasies in MD.

Method:

This study used quantitative research method, which made use of several self-reported questionnaires aimed at exploring people's previous exposure to traumatic life experiences, experience with MD, themes and functions of MD, capacity in managing distressing emotions, behavioural responses to anger, and people's preferences on negative experiences (e.g, fear, pain, sadness) that might lead to enjoyment, in people with MD-AF. Participants were recruited via online social media platforms which contained specific support groups for people with maladaptive daydreaming. The final sample consisted of 116 people.

Outcomes:

Findings were consistent with the existing literature on MD; that a reduced capacity to manage distressing emotions is associated with the use of MD-AF as a coping mechanism. Specifically, avoiding anger in real-life by withdrawing from confrontation, and things or people that makes people angry might be a specific type of strategy that people with MD-AF engage in. However, people's favour on initially negative activities (i.e. benign masochism)

was not related the use of aversive fantasies to seek pleasure from the painful emotions experienced in the daydream.

Similarly, people with AF who reported having an exposure to previous traumatic experiences also reported more intensive MD, and this outcome could be explained by an increase in painful and intolerable emotions from the losses or changes experienced from the traumatic experiences. Subsequent investigations also suggested that engaging in MD-AF could also lead to the experience of more intolerable and painful feelings in real-life, though the underlying mechanism was not directly measured.

Conclusions:

In keeping with previous research, the use of aversive fantasies was seen as a coping mechanism to cope with and manage those painful and tormenting emotions individuals have experienced in real-life. However, MD with aversive fantasies itself might also potentially increase the distress. Practical implications might suggest a need for more comprehensive psychological formulation models to encapsulate the experience of MD, to inform types of treatments that can be helpful to help people with MD to explore, approach, access and manage these challenging emotions.

Thank you again for your consideration and approval on this project.

Best Regards,

Titian Tam
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Salomons Institute for Applied Psychology
Canterbury Christ Church University, UK
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Supervised by:
Dr Amy Lucas; Dr John McGowan

Appendix R

Author Guideline Notes for the Chosen Journal for Submission

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