Research Square

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The Reflection of Childhood Memories in Adult Dreams: A Psychological and Physiological Approach

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Abstract

Purpose

Dreams reflect memory processes, incorporating long-term and autobiographical experiences. Early childhood memories, though often inaccessible consciously, may persist implicitly and appear symbolically in dreams, especially during emotional processing. This cross-sectional study aims to assess the frequency and themes of childhood-related memories in adult dreams in Luxor.

Methods

This cross-sectional study of 200 adults used validated questionnaires, including the Childhood Trauma Questionnaire (CTQ), Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder Scale (GAD-7), Pittsburgh Sleep Quality Index (PSQI), SLEEP-50, Nightmare Distress Questionnaire (NDQ), and Everyday Memory Questionnaire-Revised (EMQ-R), to assess childhood experiences, dream content, mental health, and sleep quality. Participants reported dream details, which were analyzed with clinical and demographic data.

Results

Participants (mean age 32.19 ± 8.57; 49% males) showed 59% poor sleep quality. Memory-related dreams occurred in 92%, mainly daily events (24%), trauma (20%), and family (14%); parents appeared in 54%. Dreams were short (14.41 ± 4.79 minutes) and moderately intense. Males had longer dreams ($p = 0.039$) and stronger childhood links ($p < 0.001$). Poor sleep was associated with longer duration, higher intensity ($p < 0.001$), negative affect ($p = 0.003$), and stronger childhood links ($p < 0.001$). Dream duration correlated with trauma, anxiety, and depression (all $p < 0.001$). Anxiety reduced dream–memory continuity ($p = 0.003$). Regression identified dream duration as the only significant predictor ($\beta = -0.239$, $p < 0.001$).

Conclusion

Adult dreams partially reflect childhood memories through emotional and memory-processing mechanisms. Poor sleep, anxiety, trauma, and longer dreams increase emotional intensity but weaken memory continuity, with clinical relevance for psychological assessment.

Introduction

Dreams are a multifaceted cognitive and emotional phenomenon that involves memory. Dreams are not random as they successfully retrieve scenes from your waking life including long-term and

autobiographical memory [1]. While we don't recall much of early experiences consciousy because of childhood amnesia, it can be found in implicit memory and may be used in the content of our dreams [2].

Studies show that while adults do not remember many dreams from their early years (before three years of age), early experiences can be encoded symbolically and reconstructively in the form of dreams. A recent study of sleep by **Zhang et al.**, [3], provides evidence that dreaming is involved in the reorganisation and processing of emotional memory, which may explain why intense childhood memories (such as those of fear and stress) are represented in adult dreams. Childhood recurrent dreams are also more emotionally salient compared to adult dreams [4].

Personally the ability to recall dreams is important as adults who recall dreams often show enhanced access to their childhood memories, which supports the relationship between memory and dreaming. Dreams are a phenomenological link between the past and the present, enabling early experiences to remain influential over time [5].

This study aims to examine how frequently childhood-related memories appear in adult dreams and to identify their main themes among adults in Luxor Governorate.

Patients and methods

This was a descriptive–analytical cross-sectional study that examined the association between childhood memories and adults' dream content, as well as the impact of psychological and sleep variables on this association.

Setting and Population

The research was performed at the Luxor University Hospital's psychiatric and sleep clinics, as well as from nearby community health clinics to include a spectrum of sociodemographic and clinical variables.

Sample Size and Sampling

An initial feasibility and variability study was conducted on 25 participants. A sample size of at least 200 participants was decided based on a power analysis for multiple linear regression (effect size $f^2 = 0.10$, $\alpha = 0.05$, power = 80%). We used consecutive sampling for participant recruitment, and subsequently classified them based on sleep quality using the Pittsburgh Sleep Quality Index (PSQI) [6].

Eligibility Criteria

Participants were adults (18 years or more), who spoke Arabic, remembered at least one dream per month and gave informed consent. Participants were excluded if they had severe cognitive impairment

or dementia, current manic or psychotic episodes, alcohol and substance use disorders, difficulty communicating or being understood, and dream amnesia.

Data Collection Tools

A structured questionnaire using validated measures was used to collect data. Clinical and demographic variables included age, sex, place of living and educational level. The Childhood Trauma Questionnaire (CTQ) [7] was used to investigate childhood experiences. Dream characteristics were assessed via a structured report on dream type, length, intensity, mood, recurring dream characters and associations with past events. Psychological and sleep outcomes included the Patient Health Questionnaire (PHQ-9) [8]for depression, Generalized Anxiety Disorder Scale (GAD-7) [9]for anxiety, Pittsburgh Sleep Quality Index (PSQI) [6] and SLEEP-50 [10] for sleep quality and disturbances, Nightmare Distress Questionnaire (NDQ) [11], and Everyday Memory Questionnaire-Revised (EMQ-R**)** [12].

Study Variables

The main variables were the occurrence and content of dreams about childhood experiences, and the perceived associations between dream content and childhood. The secondary variables included characteristics of dreams and memories (duration, intensity, vividness, clarity, emotional valence, continuity), psychological well-being (depression and anxiety), and sleep quality.

Data Collection Procedure

Participants were interviewed individually after signing informed consent. The participants were asked to share their demographic and clinical details, then complete all psychometric scales. They then provided details of their most recent or most memorable dreams in a structured format, and clarification questions were used to standardise responses but not influence content. Data were deidentified and coded for analysis.

Institutional Review Board of Luxor Faculty of Medicine approved this study under the ethical approval code: Luxmed-070125-109. All participants were adults, gave written consent, and were informed of their right to withdraw from the study at any time with no repercussions.

Data were entered and analyzed by Microsoft Excel 2016 and IBM SPSS 25. The Kolmogorov-Smirnov test was used to assess normality. Continuous data were expressed as mean ± SD or median (IQR), with categorical data expressed as numbers and percentages. Comparisons between groups were made using t-test, Mann-Whitney U and Chi-square tests (with Monte Carlo correction if required). Pearson or Spearman analyses were used for correlations and multiple linear regression was used to determine predictors of dream memory continuity. Data were explored for latent structure using factor analysis (Principal Axis Factoring with Varimax rotation) and internal consistency was assessed using Cronbach's alpha. $p \leq 0.05$ was considered statistically significant.

Results

The study included 200 participants who could recall and report at least one dream per month attending outpatient psychiatric and sleep clinics at Luxor University Hospital. The average age was 32.19 ± 8.57 years, with a equal distribution of males (49%) and females (51%). The majority had a university degree (51%). Psychometric testing showed mild depressive and anxiety symptoms. Most (59%) of the sample had poor sleep quality (PSQI) (Supplementary Table 1). A total of 27% of subjects reported disturbing dreams, 18% positive. Dreams were relatively short in duration (14.41 ± 4.79 minutes) and were moderately intense (median 7). Parents were the most frequent dream characters (54%). The majority (92%) reported memory themes in their dreams (such as daily events (24%), fear or trauma (20%), and family or social relationships (14%) (Supplementary Table 2).

Table 1
Comparison of dream and memory characteristics between males and females.

Dreams duration (minutes)	**Males**	**Females**	**P-value**
	15.12 ± 5.41	**13.73 ± 4.01**	**0.039***
Dream Intensity	7 (5–9)	6 (5–8)	0.086
Dream Vividness Score	2.53 ± 1.02	2.63 ± 0.89	0.474
Negative Dream Affect	2.51 ± 0.96	2.51 ± 1.00	0.998
Dream Memory Continuity Index	2 (2–3)	3 (2–3)	0.164
Memory Vividness Score	2.41 ± 0.76	2.59 ± 0.69	0.081
Memory Emotional Valence	1.82 ± 0.99	2.02 ± 1.25	0.205
Perceived link between dream and childhood experience	47 (32–60)	37 (29–49)	**< 0.001***

$p > 0.05$ is non-significant; $p \leq 0.05$ is significant. Analysis done by Indepenent Sample T test **&** Mann-Whitney U test

Males had significantly longer dream duration ($p = 0.039$) and stronger perceived linkage between dreams and childhood experiences ($p < 0.001$) compared with females. No significant gender differences were found in other parameters (all $p > 0.05$).

Table 2
Relation between sleep quality and childhood experience& different variables

Dreams duration (minutes)	**Good Sleep (PSQI ≤ 5)**	**Poor Sleep (PSQI > 5)**	**P-value**
	11.93 ± 2.61	**16.14 ± 5.19**	**< 0.001**
Dream Intensity	5 (5–6)	8 (5–9)	**< 0.001**
Dream Vividness Score	2.54 ± 0.95	2.61 ± 0.96	0.592
Negative Dream Affect	2.27 ± 0.92	2.68 ± 0.99	0.003
Dream Memory Continuity Index	3 (2–3)	3 (1–3)	0.992
Memory Vividness Score	2.56 ± 0.74	2.46 ± 0.72	0.326
Memory Emotional Valence	1.88 ± 1.12	1.95 ± 1.15	0.663
Perceived link between dream and childhood experience	29 (26–31)	50 (42–64)	**< 0.001**

$p > 0.05$ is non-significant; $p \leq 0.05$ is significant. Analysis done by Chi-square test, Montecarlo Correction, Indepenent Sample T test **&** Mann-Whitney U test

Poor sleep quality was associated with significantly longer dream duration ($p < 0.001$), higher dream intensity ($p < 0.001$), and increased negative dream affect ($p = 0.003$). A stronger perceived link between dreams and childhood experiences was also observed in poor sleepers ($p < 0.001$). Other dream and memory parameters, including vividness, emotional valence, and continuity, showed no significant differences (all $p > 0.05$).

Table 3
Differences in dream-memory continuity scores based on gender, and clinical levels of anxiety/depression

			Dream memory continuity index	p-value
		N	Median (IQR)	
Anxiety	**Minimal**	52	4 (1–4)	**P = 0.003**
	Mild	72	3.5 (2–4)	Mild vs moderate = 0.019 Mild vs severe = 0.009
	Moderate	42	3 (1–3)	
	Severe	34	2 (1–3)	
Depression	**No**	64	3 (2–3)	P = 0.082
	Mild	56	3 (2–3.5)	
	Moderate to severe	80	2 (1–3)	
Gender	**Female**	102	3 (2–3)	P = 0.164
	Male	98	2 (2–3)	

$p > 0.05$ is non-significant; $p \leq 0.05$ is significant.

Analysis done by Kruskal Wallis test and Mann-Whitney U test

Dream memory continuity decreased significantly with increasing anxiety severity ($p = 0.003$), with lower scores in moderate and severe anxiety compared to mild cases ($p = 0.019$ and $p = 0.009$, respectively). Depression showed a non-significant decreasing trend ($p = 0.082$), and no significant gender differences were observed ($p = 0.164$).

Table 4
Correlation between dream characteristics and psychosocial variables.

		Dream Vividness Score	Negative Dream Affect	Dream Memory Continuity Index	Perceived dreams duration
Memory Vividness Score	**r**	-0.070	-0.312	0.075	-0.019
	P-value	0.489	**0.002**	0.456	0.852
Memory Emotional Valence	**r**	-0.072	-0.076	-0.076	0.104
	P-value	0.479	0.451	0.453	0.301
CTQ (Childhood Trauma Questionnaire)	**r**	0.037	0.148	-0.123	0.617
	P-value	0.713	0.141	0.224	**< 0.001**
Age	**r**	-0.021	-0.078	0.028	-0.076
	P-value	0.773	0.273	0.693	0.287
PHQ-9	**r**	0.045	0.153	-0.117	0.623
	P-value	0.527	**0.031**	0.100	**< 0.001**
GAD-7	**r**	0.074	0.134	-0.127	0.654
	P-value	0.298	0.059	0.074	**< 0.001**
PSQI	**r**	0.047	0.170	-0.116	0.592
	P-value	0.508	0.016	0.103	**< 0.001**

Negative dreams were associated with reduced memory vividness ($p = 0.002$). Dream duration showed strong positive correlations with childhood trauma, depression, and anxiety (all $p < 0.001$) and was also associated with poor sleep quality ($p < 0.001$). Memory emotional valence and dream continuity were not significantly related to psychosocial factors ($p > 0.05$).

In multiple linear regression, only perceived dream duration significantly predicted lower dream-memory continuity ($B = -0.060$, $\beta = -0.239$, $p < 0.001$). In contrast, memory vividness ($p = 0.413$) and memory emotional valence ($p = 0.367$) did not significantly predict dream-memory continuity.

Table 5
Internal Consistency of ADEQ

Scale	Number of items	Cronbach α
Childhood Memory items (CM1-CM9)	9	0.790
Dream Content items (D10-D16)	7	0.640
Perceived Link items (PL17-PL19)	3	0.780
Total scale	19	0.720

The ADEQ showed good internal consistency for Childhood Memory (α = 0.790) and Perceived Link (α = 0.780), while Dream Content demonstrated marginal reliability (α = 0.64). Overall, the total scale showed satisfactory reliability (α = 0.720).

Table 6
Rotated Factor Loadings of Items (≥ 0.4) Based on Principal Axis Factoring with Varimax Rotation

KMO and Bartlett Test			
Test	**Value**		
Kaiser-Meyer-Olkin	0.680		
Bartlett Chi-square	315.03		
df	45		
P	< 0.001		
Rotated Factor Loadings (Varimax) for Items with Loadings ≥ 0.4			
Item	**Factor 1**	**Factor 2**	**Factor 3**
D11	–	–	0.765
D15	–	0.634	–
D16	–	0.465	–
PL17	0.699	–	–
PL18	0.708	–	–
PL19	0.729	–	–
Extraction Method: Principal Axis Factoring			
Rotation Method: Varimax with Kaiser Normalization			

ADEQ showed adequate factorability (KMO = 0.680; Bartlett's test p < 0.001). Factor analysis (Principal Axis Factoring with Varimax rotation) extracted 3 factors explaining 36.3% of total variance. Items with

loadings ≥ 0.4 (D11, D15, D16, PL17–PL19) defined the factors with minimal cross-loadings. Some items (CM3–CM5) showed weak loadings.

Discussion

The main finding here was that men reported longer dream duration and sex differences in the perceived association of dream with childhood memories (with men having stronger association), but no other sexes differences in dream characteristics. Our findings suggest the continuity theory that the overall sex differences in dream production reflect waking autobiographical concerns instead of sex differences [13] and the theory that it assumes comparable brain activation patterns in men and women but interpretation can be different after awakening [14].

This is in line with **Schredl et al.** [15] who reported that women usually have a slightly higher dream recall level (10–20% higher) than men and the majority of quantitative dream variables have small effect sizes (as we found no large sex differences in dream vividness and mood). But it partly contradicts previous results that demonstrated women report more recurrent dreams and more intense emotions, with difference usually ranging between 10 and 15%, not large gender differences like 60% for men and 45–50% for women [13]. This finding of greater association with childhood memories in males also does not always hold, as autobiographical recall is common in both male and female dreamers with no consistent gender dominance [13] and may reflect cultural or sample biases.

We found worse sleep quality was related to longer, more intense, more negative, and more childhood-influenced dreams. It merits evidence that general fragmentation and frequent awakenings, as well as heightened arousal, increase dreaming and dysphoric dreams [16]. And it supports the theory that emotional memories are consolidated in REM sleep, so that sleep fragmentation leads to less complete emotional consolidation [3].

Our results are in line with **Levin & Nielsen** [17] who reported greater frequency of nightmares and days-long doubling of scores for dream distress in bad quality sleepers than good. Our results are also consistent with **Eichenlaub et al.** [18], who reported fragmented sleep increases dream frequency by 35%. But, they are partly at odds with **Sterpenich et al.** [19] who found objective parameters of REM sleep (such as REM duration) were not consistently associated with dream negativity, but subjective sleep quality.

We found subjective dream-memory continuity was significantly lower in patients with higher levels of anxiety, but not depression or sex. This is consistent with the notion that anxiety affects autobiographical integration via hypervigilance, intrusive thoughts and blunted emotions [20]. We found no effects of depression so it may be more related to dream content [21]. This supports **Schredl & Reinhard** [22], who report near to moderate associations of anxiety distress with nightmare severity ($r \approx 0.26–0.44$) and **Scarpelli et al.** [23], who report high levels of anxiety were significantly associated with increased dream fragmentation and negative affect. But contradicts **Pesonen et al.** [24], who found depression is a predictor of (rather than anxiety) so it is possible this is due to population differences.

Moreover, we found negative dreams were negatively related to children's episodic memory and negative dreams length was positively related to trauma, anxiety, depression and sleep problems. This could possibly indicate that nightmares may render autobiographical memories in a fragmented and symbolic way to prevent simulation [25]. Trauma theories also mean that emotional memories may be applied in different forms of recall (visual, fragmented) which have lower explicit learnable and higher emotions [26]. This is in line with **Germain** [27] who found trauma survivors have highly emotional and fragmented recurrent dreams. This also accords with **Fellman et al.** [28], who reported a 2-fold increase in nightmare reports of adults with anxiety or depression and sleep quality. But, it partially contradicts **Eichenlaub et al.** [1], who found that waking experiences, particularly recent events, can be integrated into dreams with high vividness.

But regarding a specific relationship between the predictive variables and the coherence with memory, the regression analysis only revealed a negative effect of the duration of dreams. This finding agrees with extended dreams containing greater associative drift, narrative complexity and symbolic recombination but less autobiographical continuity [29]. Similarly, activation-synthesis theory suggests long intervals of internally generated activity lead to less memory-congruent but more complex narratives [30].

This finding accords with research that longer dreams are composed of multiple scene transitions, and memory sequences recombined in different ways [25]. It is also consistent with **Schredl** [13], who have reported dream length is more related to narrative than memory accuracy, with 30% more transitions in longer dreams. It does not accord with **Wamsley & Stickgold** [31] who have suggested higher complexity and longer dreams improve memory recall and enhance performance following sleep.

As for reliability, our research revealed adequate (good, low) internal consistency for childhood memory and perceived-link aspects, but lower consistency for dream-content items, with acceptable overall reliability. This finding is in line with Schredl et al. (2014), who showed good reliability of the Mannheim Dream Questionnaire (Cronbach's alpha = 0.910), and **Buysse et al.** [6], who showed an overall reliability of the PSQI of 0.83. Reliability of dream content scales tends to be lower (< 0.70) due to psychological construct variability.

Exploratory factor analysis confirmed suitability of the sample (significant Bartlett's test, $p < .001$) and found a multidimensionality with a high explained variance. This is consistent with theories of dreaming involving the interaction of memory reactivation, emotional processing and interpretation systems [32]. These results are in line with **Yu** [33], who found KMO values of > 0.80, significant Bartlett test ($p < .001$), and a four/multidimensional structure with four higher and eight lower order factors.

They are also consistent with **Schredl et al.** [34], who reported that dream questionnaires typically divide into emotional, recall and dream-content scales, consistent with our multidimensional ADEQ structure.

The findings should be interpreted with caution due to several limitations. The cross-sectional nature of the study means causality cannot be established; and there could be recall bias in dream data. Dream

content is highly subjective, which can affect its measurement and cultural factors may influence the reporting of dream content, affecting interpretability. Also, no objective sleep data limit connections to sleep stages. While the findings reported above were significant, the effects were only small to moderate, suggesting that dream characteristics are not the product of a single factor.

Conclusion

Our study supports a biopsychological framework where adult dreams partially incorporate childhood memories via mechanisms involving the interplay of memory pathways and processing during rapid-eye movement (REM) sleep and distress. Sleep deprivation, anxiety, trauma and longer dreaming increase emotional content but decrease direct memory connections, consistent with continuity and activation-synthesis theories. In clinical practice, recurrent childhood or distressing dreams may suggest PTSD or anxiety and sleep issues, and can serve as a supplement to psychiatric evaluation.

Declarations

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