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ARTICLE

Psychological Health of Wives' of Patients with Chronic Illnesses

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Abstract: Objectives: Chronic illnesses are more prevalent in males. The expectations of caregiving, thus falls on the women. Role expectations from women, increases stress, strain and the possibility of Psychological health concerns. In this paper, we explore the psychological health, as well as the levels of marital and sexual satisfaction of women caregivers.
Method: The sample consisted of 35 women, whose husbands were diagnosed with, and undergoing treatment for a chronic illness (Coronary Heart Disease (CHD); Diabetes; or Cancer). Three standardized questionnaires, the Index of Marital Satisfaction (IMS), Index of Sexual Satisfaction (ISS) and the Depression Anxiety Stress Scale 21 (DASS 21) were used.
Results: Correlational and predictive analysis were conducted on the data. Clinically significant marital and sexual dissatisfaction were found. Wives' also reported moderate levels of depression and anxiety, but severe levels of stress. Depression and Sexual satisfaction were found to be significant predictors of marital satisfaction.
Discussion: Women caregiver are impacted by the illness status of their spouse. The additional stress of caregiving, along with societally ascribed roles and responsibilities on women creates a more difficult, stressful environment, which affects psychological health and well-being.

Keywords: Depression, Anxiety, Stress, Wives', Caregivers, Chronic illness

1. Introduction

Women caregivers tend to face more stress, [1,2] with the sheer number of roles, responsibilities, expectations placed on them. This takes a toll on their physical, emotional as well as psychological health [3-5]. The gender-role socialization framework, [5] the gender-role expectation framework [3] and theories of labour marked segregation, [4] suggest that women put in more hours of care, face greater amounts of challenges from the care receivers, and thus need more help with activities of daily living than men. The societal and role expectations placed on women to be the care givers, makes it less likely for them to place their ill relatives into a care facility, thus leading to more burden of responsibility and care onto them. This tends to increase distress, depression and burden, among women care givers [6-10].

In India, reports suggest that the number of deaths due to chronic diseases have been steadily rising [11-14]. The World Health Organization reported a total of 9,569,000 deaths in India in 2016 [15]. Of those total deaths, 27% were caused by cardiovascular disease; 11% by chronic respiratory disease; 9% by cancers; 3% by diabetes, and 13% were other Non-communicable Diseases. In

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2016, 63% of all deaths were from Non-Communicable Diseases, which increased from 60% in 2014 [15-17]. With men having a higher probability of dying from a non-communicable disease, than women, [15] we see that the burden of care often falls onto women.

Chronic illnesses permeate all aspects of a family's life [18]. The dysfunctions caused by these illnesses, aren't limited to the patient, but affect the partner, the couple's dynamic, as well as having a considerable impact on the satisfaction levels in the relationship [19]. Symptoms of an illness can indirectly impair relationship quality, eliciting partner anger and frustration, reducing relational satisfaction and increasing distress felt [20]. According to marital quality theory, [21] the level of individual distress experienced by one member of a couple impacts marital satisfaction. The more severe the symptoms, the greater the marital distress experienced. Behavioural and personality changes from the patient, overpower emotional bonds between the caregiver and the patient, [22] which may reduce caregiver's feeling of efficiency in the caregiving situation, and leave spouses feeling emotionally detached from their afflicted partner [23]. This may lead to increase in conflicts, and negative affect. The greater the negative affect, the greater the frequency of depression, anxiety, and somatization in the caregiver [24-26].

Wives' caring for spouses reported more depressive symptoms, but depressive symptoms were lower for couples with higher marital satisfaction [27]. The level of impairment caused by the illness, is also very important [28,29]. Higher the impairment, greater the burden, and thus lower the relationship satisfaction. Psychological distress too, was related to the relationship satisfaction in the care-taker, with depression contributing to lower levels of marital satisfaction [30-33]. Couples who exhibit marital difficulties, have high rates of psychological disorders, particularly depression among Wives' [34,35]. Men and women in satisfying marriages appear to be at lower risk for psychiatric disorders [36]. Depression has been linked to marital dissatisfaction, [37] and also reduction in the efficacy of treatment [38,39].

Rising numbers of chronic illnesses in India, and that they are observed more frequently in males, all point to the fact that women have an increased burden of care taking for patients with chronic illness. The aim of this paper was to study the effects these chronic illnesses had on the Wives' of patients. Looking into the psychological health, in terms of depression, anxiety and stress, as well as the feelings of marital and sexual satisfaction of the Wives'.

2. Sample

The sample consisted of 35 women, whose husbands were diagnosed with a chronic illness in one of the three categories: Coronary Heart Disease (CHD); Diabetes; or Cancer. The sample for the current paper, is part of a lager study that was approved by the ethical board at

Table 1. Descriptive statistics and Parametric Correlations (Pearson's r) for Study Variables.

Variable	*n*	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Marriage Duration[a]	35	14.71	10.91	1								
2. Number of Children	35	1.23	.94	.633**	1							
3. SP Marital Satisfaction[b]	35	52.11	23.73	.166	.440**	1						
4. SP Sexual Satisfaction[b]	35	51.60	20.85	.269	.408**	.647**	1					
5. SP Depression	35	17.49	11.50	-.179	.065	.386*	.081	1				
6. SP Anxiety	35	18.23	11.18	.163	.397**	.232	.162	.399**	1			
7. SP Stress	35	23.23	11.18	.168	.274	.250	.260	.705**	.635**	1		
8. PT Number of Comorbidities	35	1.66	.68	.266	.308*	.093	.271	-.120	-.074	.049	1	
9. Duration of Caregiving[a]	35	8.11	4.72	.441**	.305*	.111	.236	-.158	-.047	.085	.641**	1

Note. PT = Patients and SP = Spouses/Wives'.

a. Variables are measured in years.

b. Higher score on the variables indicate lower satisfaction.

*$p < .05$ (1-tailed), **$p < .01$ (1-tailed).

the Savitribai Phule Pune University. The sample was a purposive sample drawn from volunteer patients, as well as references from patients, based upon ethical guidelines that were set up for the study. Informed consent was taken from all participants.

Table 1 shows the descriptive statistics of the sample. The *mean* age of the sample was 40.2 years (SD = 9.27); Duration of marriage was 14.71 years (SD = 10.91). Total years of caregiving *mean* 8.11 years (SD = 4.72).

3. Tools

Three standardized questionnaires were used for this study coupled with a brief socio-demographic form. Individuals filled out either paper pencil copies or online Google Forms of the questionnaires by themselves.

Index of Marital Satisfaction (IMS) and Index of Sexual Satisfaction (ISS)

The IMS and the ISS are both a 25-item instrument designed to measure the degree, severity, or magnitude of a problem in the marital and sexual relationship respectively. They measure the extent to which one partner perceives problems in the relationship. The IMS and ISS contain 25 category-partition (Likert-type) items, some of which are worded negatively to offset the potential for response set bias. Scores range from 0 to 100, with higher scores indicating greater degrees of marital or sexual discord. A score above 30 indicates clinically significant dissatisfaction. Scores above 70 indicate that the individual is experiencing severe stress, with a clear possibility of some type of violence being used to deal with the problem.

The IMS has a mean Cronbach's α of 0.96, indicating excellent internal consistency, and an excellent (low) Standard Error of Measurement of 4.00. The IMS also has excellent two-hour test-retest correlation of 0.96. The IMS has excellent concurrent validity, correlating significantly with the Locke-Wallace Marital Adjustment Test. The IMS also has very good known-groups validity, discriminating significantly between couples known to have marital problems and those known not to.

The ISS has a mean Cronbach's α of 0.92, indicating excellent internal consistency, and a (low) SEM of 4.24. The test-retest correlation was found to be 0.94. The ISS has excellent concurrent validity, correlating significantly with the Locke-Wallace Marital Adjustment Scale and the Index of Marital Satisfaction. It has excellent known-groups validity, significantly distinguishing between people known to have problems with sexual satisfaction and those known not to.

Depression Anxiety Stress Scale 21 (DASS 21)

The DASS, is a self-report questionnaire, designed to measure the negative emotional states of depression, anxiety, and stress. The shorter 21 item version was used here. Each subscale contains 7 items. The subjects are asked to rate the severity or frequency of each item, on a four-point scale.

The three scales are moderately inter-correlated with typical r_s ranging between 0.5 - 0.7. The internal consistency, Cronbach's α for the DASS is 0.96 for the depression scale, 0.89 for the anxiety scale and 0.93 for the stress scale. The reliabilities (internal consistencies) of the DASS-21 range between .93 to .82.

4. Results

A correlational and predictive analysis was conducted on the data. The results of the study found that the mean scores on the Index of Marital Satisfaction (IMS) and Index of Sexual Satisfaction (ISS) were 52.11 (*SD* = 23.73) and 51.06 (*SD* = 20.85) respectively. Indicating clinically significant marital and sexual dissatisfaction

Table 2. Multiple Linear Regression (Stepwise) for Marital Satisfaction.

Model	Predictors	*R*	R^2	Adjusted R^2	β	*F*
1	SP Sexual Satisfaction	.647	.419	.401	.647	23.805***
2	SP Sexual Satisfaction & SP Depression	.729	.531	.502	.620[a], .336[b]	18.124***

Note. SP = Spouses/Wives'. $N = 35$, β = Standardized coefficient Beta.
a. β for SP Sexual Satisfaction.
b. β for SP Depression.
Dependent variable = Marital Satisfaction.
***$p < .001$

(Table 1).

On the DASS-21 (Table 1), scores on the Depression subscale, 17.49 (*SD* = 11.50) indicate a Moderate level of depression. On the Anxiety subscale, *mean* scores of 18.23 (*SD* = 11.18) are indicative of a Severe level of anxiety. *Mean* scores on the Stress subscale of 23.23 (*SD* = 11.18) were indicative of a Moderate level of stress in the sample.

Correlations

Pearson correlation was also conducted on the variables (Table 1). Significant positive correlations were found between number of children and IMS, $r = .440$; $p < .01$, indicating that the greater the number of children the more the dissatisfaction in the marital relationships. Significant positive correlations were also found between Number of children and ISS, $r = .408$; $p < .01$, indicating greater dissatisfaction with sexual relations as the number of children increase. Anxiety was also significantly and positively correlated with number of children; $r = .397$; $p < .01$, indicating greater anxiety scores with an increase in the number of children.

IMS and ISS were also significantly positively correlated to each other, $r = .647$; $p < .01$, indicating an increase in scores on one construct increases the scores on the other. Higher scores on the *IMS* and *ISS* indicate poor satisfaction. IMS and Depression were also significantly positively correlated; $r = .386$; $p < .05$.

Insignificant, though very weak positive correlations were also found between, duration of marriage and ISS, $r = .269$; $p = .059$; indicating that there is a relationship between ISS and an increase in the number of years of marriage. Another insignificant and very weak positive correlation was between number of children and stress, $r = .274$; $p = .056$. IMS and Anxiety ($r = .232$; $p = .09$) and IMS and Stress ($r = .250$; $p = .074$) were also found to be positively, but insignificantly correlated, indicating increasing anxiety and stress levels as levels of marital dissatisfaction increased. Similar very weak positive correlations were also found with *ISS* and S*tress* ($r = .260$; $p = .066$); *ISS* and Patients number of comorbidities ($r = .271$; $p = .057$); and *ISS* and number of years of caregiving ($r = .236$; $p = .086$).

Regression Analysis

A multiple linear regression (Stepwise) was calculated to predict IMS based on ISS and depression (Table 2). A significant regression equation was found (F (2,32) = 18.124, $p < .000$), with an R^2 of .531. Participants' predicted IMS is equal to 3.575 + .706 (ISS) + .693 (Depression). Participants IMS score increased by .706 for each 1 unit increase of ISS score and .693 for each unit increase in depression score. Both ISS and depression were significant predictors of IMS, Adjusted $R^2 = .502$, indicating that more than half of the variance in marital dissatisfaction is attributed to sexual dissatisfaction and depression. Taken by itself, depression accounted for about 10.1% of variance in the IMS.

5. Discussion

The results indicate moderate levels of depression and stress, but severe levels of anxiety in the sample of spousal caregivers. It rings true to what Revenson [18] had said "The chronic illness of one family member permeates every aspect of family life". Porto [19] also mused, that chronic illnesses are stressful for both patients and spouses. Studies have also found support for an increase in psychological distress with Wives' of patients with chronic illnesses [8] and also greater tendencies to worry and to ruminate [6]. The roles and responsibilities held by women too tend to add stress. Women caregivers have more stressors than their male counterparts. In fact, the roles and responsibilities as well as societal expectations and pressures put onto women caregivers, as well as on women in general, tend to take a toll on their physical, emotional as well as psychological health [3-5].

In terms of the Marital and Sexual satisfaction scales, *means* observed were 52.11 (*SD* = 23.73) and 51.06 (*SD* = 20.85) respectively, indicative of clinically significant dissatisfaction in both the marital and sexual spheres. Fitzpatrick & Vacha-Haase [29], found that higher levels of caregiver perceived burden resulted in lower levels of marital satisfaction. Caregiving over time may become overwhelming and reduce the feelings of contentment and fulfilment in the relationship. Caring for a spouse, would also have a fair share of upsetting caregiving experiences, which would precipitate negative feelings, making it harder to find happiness in the relationship. Changes in patient's personality and behaviour, overpower emotional bonds between the caregiver and the patient [22]. Thus, effectively decreasing the overall satisfaction levels of the relationship. A dyadic relationship between marital and sexual satisfaction has also been observed, where lower scores in one partner, usually showed lower scores for the other partner as well [40]. The results of a decrease in satisfaction in both the marital and sexual sphere are also reported by Sampson et al, [41] and Kiecolt-Glaser & Newton [42]. This study too, found a strong positive correlation between the scores on the Marital and sexual satisfaction indexes ($r = .647$; $p < .01$), indicating that dissatisfaction on one index indicated a

trend of dissatisfaction on the other as well. Since marital satisfaction and sexual satisfaction are closely linked, a decrease in one tends to have a serious impact on the other, and consequently, on the over-all quality of life [40-44]. In general, sexual satisfaction is associated with marital satisfaction [45-47] further indicating that the results are in agreement with literature available.

The significant positive correlations between number of children and *IMS* (r = .440; p <.01), and between number of children and *ISS* (r = .408; p < .01), could be explained by Pinquart & Sörensen, [7] who reported that women caregivers, encountered greater stressors relating to roles and responsibilities of caregiving. They also went on to explain that most women didn't have a say in caregiving and that the caregiving role was usually thrust upon them. Factors other than caregiving too, have an impact on women's health [8]. The gender-role socialization framework, [5] the gender-role expectation framework, [3] and in theories of labour marked segregation, [4] all suggest that women put in more hours of care than men. Child bearing and care giving is another role that is usually thrust upon a woman. The stress of having children, raising them, as well as looking after a spouse with an illness could lead to more relationship conflicts, and thus reduce the levels of marital and sexual satisfaction.

The positive correlation between anxiety and number of children (r = .397; p < .01) could also be explained by the roles and responsibilities that women tend to have [3-5]. Other factors that may not be related to caregiving, but may be responsibilities and or roles that could be expected out of women too add a significant amount of strain and stress [8].

An interesting finding is the significant positive correlation between IMS and Depression (r = .386; p < .05). Lower marital satisfaction (indicated by higher scores on the IMS) was related to higher scores on the depression subscale of the DASS-21. Beach et al., [31] Whisman & Uebelacker, [32] found that, over time, marital discord predicts increases in depressive symptoms. Min et al., [27] also found similar results, where lower depressive symptomatology were found in couples who had greater marital satisfaction. Hafstrom, & Schram, [48] also found significantly lower marital satisfaction scores for Wives' with chronically ill husbands. As emotional bonds wear away, spouses may feel detached from their partners [23]. This combined with higher levels of perceived caregiver burden, reduced contentment feelings in the relationship, upsetting caregiving experiences, [7,29] reduced time for oneself and leisure activities, and feelings of isolation due to caretaking responsibilities, [49] greater stress and fewer social resources [10] could all contribute to increased feelings of depression in the relationship.

The regression analysis conducted found that *ISS* was accounted for 40.1% of variance in *IMS* scores. This finding is further substantiated by research which suggests a close relationship between marital and sexual satisfaction [40-42,45,46]. These researches also point to the interaction between the two constructs and found that there was significant interaction between the two.

Further, it was also seen that *ISS* and depression together, accounted for about 50.2% of variance in *IMS* scores. Taken by itself, depression accounted for about 10.1% of variance in the *IMS*. Depression and lower levels of psychological well-being, are frequently related to marital dissatisfaction, and relationship discord in available literature [8,31-35,37]. For women caregivers, perceived burdens of caregiving, [29] and reduction in the emotional bonds felt, due to care-giving experiences, [22] would also add to the observed trends. These findings can further be explained with the use of the gender-role socialization framework, [5] the gender-role expectation framework, [3] and theories of labour marked segregation and household labour [3,4]. Women, be it caregivers, or just in general, do tend to face more stress than males. The roles, responsibilities as well as societal expectations placed on women caregivers, as well as women in general, takes a toll on their physical and emotional as well as psychological health. They also tend to face higher levels of caregiving stress, have fewer social resources, and lower levels of psychological and physical health.

6. Conclusions

Female partners and caregivers, tend to be affected by the partner's chronic illness status [8,9,50]. The roles and responsibilities ascribed to women, gender roles and socialization, make it harder for women to cope with the additional responsibility [3-5]. Invisible factors, like expectations put on women caregivers, add to the feelings of stress and strain [2,9].

These tend to affect the emotional and psychological health of care givers, as seen by the he results of this study. The higher levels of depression, anxiety and stress, as well as poorer Marital and sexual satisfaction, are all in line with literature available.

Data Availability Statement

Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

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EDITORIAL

Outlook of Cognitive Neuroscience

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Social science researches at present emphasize the construction of relations between multiple constructs. Psychological science is no exception. Before verifying whether their hypotheses are true with a questionnaire method or experimental method, scholars will check out the hot topics of recent years and construct multiple mediating and moderating relations first. They work on scattered topics that more or less overlap with many other disciplines. In previous years, the author focused on studying the youths with poor mental health in the new era of China, observing their moral choices in the corporate environment through game theory experiments [1]. The conclusions are usually surprising- most new-generation youths choose to maximize their self-interest from between pro-social behaviors and risk aversion [2].

Psychological researches sometimes cannot go far alone. Outstanding scholars usually combine them with the knowledge of other disciplines, for example, social psychology that combines psychology and sociology, and clinical psychology that combines clinical medicine and psychology. The author hereby refers to the cognitive psychology that combines psychology and neuroscience, as well as the derived cognitive neuroscience. Some scholars have been focusing on studying brain nerves and constructing cognitive neuroscience experiments to explain the existing psychological problems with neuroscience-related knowledge. Cognitive neuroscience was a late starter compared to other disciplines. It came into being in the late 1970s but then fell silent for a long time [3]. Afterward, with the rapid development of computer science, modern cognitive neuroscience came into existence. Cognitive science once made a major breakthrough. Traditional cognitive science focused on researches on memory, thinking, attention, and other elements, but lacked inclination for psychological researches. By contrast, second-generation cognitive science has inspired people to consider such issues as mind-body relations and ideology. Psychological science includes two different research directions: scientism and humanism, both of which have produced many solid theories and articles. Cognitive neuroscience at the present stage offers an opportunity to combine the two flexibly [4].

Social cognitive neuroscience, in essence, is to study existing social cognitive phenomena with neuroscience technologies. General items of psychological researches, such as emotion, self-consciousness, decision making, and attitude, can be excavated deeply by neuroscience technologies. Existing research results show that cognitive

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neuroscience is changing some of the ideas held by the psychology community about psychological researches. Researches on the biological foundation of social behavior and social cognition are expected to become a branch of neuroscience and cognitive science [5]. Therefore, the establishment of a strong social cognitive neuroscience research team and the opening of social cognitive neuroscience courses in psychology and cognitive neuroscience will cultivate a group of world-class research talents and also a large number of teaching and application talents. Additionally, fundamental research results of social cognitive neuroscience will closely link the intervention of emotional problems and abnormal social behaviors in schools to the practical applications of hospital prevention and treatment of emotional disorders, helping build a Harmonious Society.

Of course, cognitive neuroscience also has its drawbacks. It may be unable to explain a complete psychological activity or describe human psychology and behavior. Most of the time, it can only reveal the correlations between cognitive behaviors and the nerves. However, these do not affect the research value of cognitive neuroscience. Cognitive neuroscience has the same elaborate experiments as that of cognitive psychology, and physiological psychology, neuropsychology, and other psychological categories may also be integrated under the same research paradigm.

Therefore, cognitive neuroscience, based on modern cognitive science and neuroscience, can be a future research direction for scholars.In particular, construct game experiments and use EEG research to solve the decision-making problems of contemporary youth, or to verify some important field theories in game theory.

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ARTICLE

Psychological Complaints at Psychological Emergency Service Associated with Referral to Extended Screening in a Psychology School Clinic

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Abstract: The Psychological Emergency Service (PES) at psychology school clinics is an unscheduled and free psychological service to meet urgent demands. From this service, some patients whose complaints require more time for clinical work are referred to the Extended Screening (ES), a modality composed of six extra appointments. This study aims to analyze the sociodemographic profile of patients seen on PES in a Brazilian Psychology School Clinic, and to identify the demands that motivated referral to the ES, for better qualification of the care offered. This is a descriptive analysis research, carried out based on data from the medical records of 46 patients who went through the PES and were referred to the ES at the institution, between the years 2019 and 2021. Sociodemographic data were collected and, from the session reports, a content analysis of the thematic analysis modality was performed to identify the complaints. The participants' age ranged from 18 to 65 years, with a mean of 32.28 years (sd = 10.95). There was a predominance of female participants (71.74%), that completed High School (39.14%) and had an income from one to two Brazilian minimum wages (32.61%). The most frequent complaints were depressive symptoms (56.52%) and difficulties in interpersonal relationships (32.61%). The results obtained, besides allowing the survey of the social and demographic profile of the clientele of the PES at the Psychology School Clinic, and demonstrating its social relevance by providing free psychological care, also show to be of great importance for the definition of more accurate criteria for referral to the ES of patients seen on PES.

Keywords: Psychological emergency service, Extended screening, Psychology school clinic

1. Introduction

The clinical-school service in psychology universities has been linked to this undergraduate course since Law 4,119, in 1962, through the regulation of the psychologist's profession in the Brazilian Classification of Occupations (BCO). The services are essential for the formation of a psychologist, as they enable the experience of clinical practice, providing the conduction of therapeutic processes in addition to bringing students

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closer to the population [1]. Among the services offered, there is the Psychological Emergency Service (PES) modality, which aims to support and welcome the urgent emotional demand of the person who needs some type of immediate care to alleviate their psychological distress, in addition to seeking, through the provision of a service that does not have bureaucratic requirements, to contribute to the reduction of the demand of the urgent psychological care, thus favoring the large portion of the community that does not have the resources to seek private psychological care [2].

The PES, in Brazil, began in the 1970s by Professor Rachel Rosenberg, phD, who, with the help of interns from the Psychology Faculty of the Psychological Counseling Service (PCS) at the University of São Paulo (USP), was inspired by the walk-in clinics in the United States, which offered immediate and community care. In these years of gestation of the new modality, Brazil lived a time of military repression, when the expression of ideas was suppressed by censorship. Furthermore, in psychology, it was believed that only long-term psychotherapeutic treatment was effective [3].

After an unpretentious beginning with psychological assistance to students of a popular pre-university preparatory course at USP, the revolutionary potential of the implementation of the PES was noticed, with the use of the renewing capacity of attentive, non-directive, customer-centered listening, confident in the person's up-to-date tendency, in which they develop their potential, even if it was through a single meeting with the professional [4].

Substantially, the PES aims to provide immediate listening to the person who is in need or in an emotional crisis. This modality does not constitute a psychiatric emergency service; does not assist people only in imminent suicide; it is not intended to screen for other referral services; likewise, it is not intended to be a substitute for other psychotherapy services [5]. From the institution's perspective, the PES requires diligence and method of the service offered. The on-call professional is required to be ahead with the unexpected. The meeting with the person who is looking for him or her is always unique [4].

Another urgent modality that was found necessary from the experience of the PES was the Extended Screening (ES), because from the complaint identified during the PES, many times, emergent demands arise, which require more time than a single session. In view of this, for the cases in which the on-duty professionals consider necessary, six extra appointments are offered after the initial meeting of the PES, with the purpose of helping the patients in their search for autonomy through self-reflection. The extended assistance was also elaborated aiming to attend those people who have nowhere to be referred, either because the public mental health service is exhausted or because they don't have the financial resources for a private psychotherapeutic treatment, without, however, falling into the trap of turning this model of assistance into a philanthropic or authoritarian relationship, considering the apparent fragility of the patient [4].

Recently, it is important to highlight the period of the COVID-19 pandemic, which caused a short-term increase in mental health problems such as anxiety, depression and anguish caused by the significant impact of fear, as quarantine and isolation imposed by social distancing, which resulted in social, emotional and economic changes [6-11]. The PES and the ES are valuable tools for people who have gone through traumatic experiences, such as in the current pandemic, where the terror experienced by the absence of a definitive cure for the infection evidenced a profound psychological suffering and the need for psychological intervention, even more in a global context in which countries have paralyzed many social and economic actions in order to prevent the spread of COVID-19 [11].

In Brazil, the city of Ribeirão Preto, where the present study was conducted, currently has six Psychosocial Care Centers and a specialized mental health clinic, which serve approximately fourteen thousand patients per year through the Brazilian public health system [12]. This data shows that, despite having a large number of consultations, this amount is still insufficient for a city with an estimated population of seven hundred and twenty thousand inhabitants, thus emphasizing the social importance of the service provided by psychology school clinics [13].

Although the PES is a modality of psychological care of great relevance in the mental health care of the Brazilian population, studies on the main demands observed in such service are still scarce [14], demonstrating the need for further research to better understand the challenges to which on-call professionals must be prepared for. Furthermore, the PES finds greater adherence in Brazilian mental health institutions when compared to institutions in other countries [15]. With the realization of studies that indicate its relevance, it opens up the possibility of grounding proposals of PES to other populations in the world as well, given its potential as a modality of care for urgent psychological demands.

In this manner, considering the social value of the services provided by psychology school clinics to the

mental health of the population, and given the evident gap in the literature about which demands are more associated with the need for referral to ES, this article aims at the sociodemographic characterization of patients treated on PES and the identification of the psychological demands that motivated the referral to ES at the Psychology School Clinic of a Brazilian private higher education institution since its implementation. It is expected to provide important information for a better identification of emotional problems that professionals on duty must be aware of and prepared to receive in the PES, seeking a better qualification of the care offered.

2. Materials and Methods

2.1 Design and Local of Study

This is a descriptive analysis research, carried out at the Psychology School Clinic of a private higher education institution in the city of Ribeirão Preto, in the interior of the state of São Paulo, Brazil. The institution, inaugurated in 2013, offers free Psychological Emergency Service, Extended Screening, Psychotherapy, Psychodiagnostic, Neuropsychological Assessment and Professional Guidance. The assistance takes place both by spontaneous patient search and by referrals from other health and education professionals [16]. It is worth mentioning that the Psychological Emergency Service and the Extended Screening are carried out by psychologists of the service and interns of the fourth and fifth year of the undergraduate course in psychology.

2.2 Population, Inclusion Criteria and Sample

The study population consisted of patients seen in PES at the Psychology School Clinic between 2019 and 2021 who were referred to ES. As inclusion criteria, only patients over 18 years old were included. In the performance of care at the institution, a therapeutic contract and Informed Consent Form (ICF) is presented, where patients can indicate agreement in the use of their data, both sociodemographic and from clinical care, for the production of academic studies. The convenience study sample consisted of 46 patients, all of them indicated acceptance to the ICF.

2.3 Data Collection

Data collection was performed by consulting the medical records of the study participants. In the medical records there are the reports of each service carried out in the Psychology School Clinic, as well as the patient's sociodemographic data. All reports of the Psychological Emergency Service sessions of patients who met the inclusion criteria and had indicated agreement with the ICF were consulted, as well as the sociodemographic characteristics.

2.4 Data Analysis

From the PES session reports, a content analysis of the thematic analysis modality was carried out, consistent with the instructions by Minayo [17], to categorize the complaints presented by the participants during the PES. Qualitative coding was operated by two researchers individually, considering the manifest content of the records. The codes were then grouped into categories. Researchers compared their interpretations to ensure reliability and accuracy. For all cases, the agreement between the two analyst researchers was > 90%. A third researcher on the team, with extensive experience in clinical psychology and mental health, performed a third reading of the data to confirm the final proposed categorization.

The data were tabulated in a spreadsheet of the Microsoft Excel for Windows software, having been double-entered by the researchers involved, in order to obtain reliable and error-free data. Then, the characterization of the sociodemographic profile of the participants was carried out, using descriptive statistics. Measures of central tendency (mean and median) and measures of variability or dispersion (minimum and maximum, standard deviation) for the variable "age"; simple and relative frequency for the variables "gender", "education" and "income" and relative frequency of the "complaints presented" were used.

2.5 Ethical Aspects

This study was carried out in accordance with the guidelines and regulatory standards for research involving human beings that comply with Resolution No. 466/2012 of the Brazilian National Health Council [18]. The project was approved by the Research Ethics Committee of Barão de Mauá University Center under Opinion number 3.251.726 of April 09, 2019.

3. Results

As for the sociodemographic characteristics of the 46 study participants, age ranged from 18 to 65 years, with a mean of 32.28 years (sd = 10.95) and a median of 30.50. As shown in Table 1, there was a predominance of female participants (71.74%), that completed High School (39.14%) and had an income from one to two Brazilian minimum wages (32.61%) (in 2021, the Brazilian minimum wage was approximately 192 dollars).

Table 1. Sociodemographic characteristics of the participants – Ribeirão Preto, Brazil, 2021 (n = 46).

Sociodemographic Variable	Classification	N	%
Sex	Female	33	71.74
	Male	13	28.26
Education	Incomplete Elementary School	3	6.52
	Complete Elementary School	1	2.17
	Incomplete High School	1	2.17
	Complete High School	18	39.14
	Incomplete Higher Education	6	13.04
	Complete Higher Education	17	36.96
Income	Up to 1 minimum wage	4	8.70
	1 to 2 minimum wages	15	32.61
	2 to 3 minimum wages	11	23.91
	3 to 5 minimum wages	9	19.56
	Uninformed	7	15.22

The categorization of the complaints presented during the PES, which motivated the referral to the ES, is shown on Table 2.

Table 2. Categorization of the complaints presented during the PES.

Category	Codes
Use of drugs	History of difficulties associated with the use of psychoactive substances
Grief	Death of family members; disruption of family or affective relationships
Difficulties in emotional regulation	Irritability; difficulties in containing crying; emotional lability
Depressive symptoms	Depressed mood; reduction in volition; sleep changes; energy loss; appetite changes
Difficulties in interpersonal relationships	Difficulties in relationships with family members, spouses or co-workers
Suicidal thoughts	Thoughts about the possibility of taking one's own life
Anxiety symptoms	Excessive worry and apprehension about the future; tension; associated physical symptoms such as tachycardia and sweating
Psychosomatic symptoms	Physical complaints associated with emotional disorders

Regarding the relative frequency of each category, considering all study participants (n=46), there was a predominance of depressive symptoms (56.52%), followed by difficulties in interpersonal relationships (32.61%) (Figure 1). It is noteworthy that, for each participant, one or more complaints were identified.

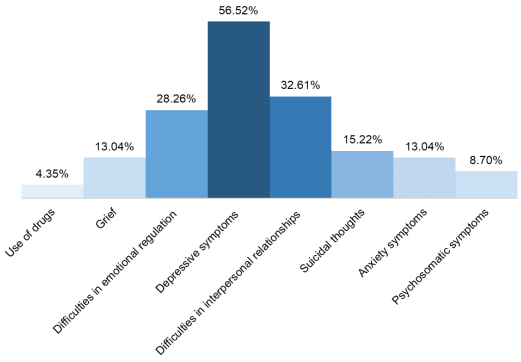

Figure 1. Complaints presented at the Psychological Emergency Service by all participants referred to the Extended Screening – Ribeirão Preto, Brazil, 2021 (n = 46).

4. Discussion

In the survey of complaints presented by patients treated on PES and referred to ES, more than half (56.52%) of the cases were due to depressive symptoms, confirming Motta [19]: "with prevalence rates that reach up to 20% of the world population, depression impacts the social environment in such a way that it is considered the second pathology to cause more damage in the economic and social sphere". Whereas most patients of psychology school clinics seek such services because they cannot find care in the public health system and cannot afford to pay for private services, Silva and Vieira [20] demonstrate: "the depressive experiences may represent a social symptom that reveals the significant helplessness produced from the state and social disengagement with a part of the population that lives its daily life based on precariousness and scarcity".

In second place, difficulties in interpersonal relationships appeared, with 32.61% of the complaints referred. It is possible to associate such complaints to the liquid relationships that permeate today's society. With social networks, people have the possibility of "connecting" rather than "engaging" with each other, making it easier to build and deconstruct relationships, in which there are intentions to be together, but at the same time not establish lasting relationships, causing instability in the relationships that permeate liquid modernity, where there are uncertainties and insecurities in the face of difficulties and risks of a new relationship. Faced with such instabilities, it is possible that superficiality and speed of relationships appear as a form of defense [21,22].

It is important to note that part of the psychological appointments in the study sample took place during the period in which the pandemic caused by COVID-19

began, until its aggravation, a fact that had a profound psychological impact on the global population, as the fear of contracting the disease, along with the insecurity of the changes brought about by the sanitary measures, necessary for the contingency of the spread of the virus, such as social isolation and quarantine, led to an increase in depressive symptoms, anxiety and problems in interpersonal relationships [23-26].

In this way, the PES and ES accompanied this increase in psychological distress caused by fear and insecurity associated with the loss of work routine and a compulsory confinement, often in a hostile environment, from which there was no escape [23]. Added to this is the fear of unemployment, physical and psychological violence, loneliness, uncertainty about the future, hopelessness and the uncertainty of life itself [23-26]. It may be inferred that these factors contributed to the increase of depressive symptoms, and may have influenced the increase of difficulties in interpersonal relationships among the patients, besides the liquidity associated to modernity, considering that the period of social isolation generated new challenges to interpersonal relationships, as the increase in the time spent with family members, which may be associated with the exacerbation of previous relationship problems [20,27,28].

As to what was observed regarding the greater number of women assisted in PES, the literature indicates that men are often less inclined to seek help due to emotional difficulties, as the construction of the male ideal in contemporary Western society is associated with strength, autonomy and avoidance of possible demonstrations of fragility, impacting the search for mental health professionals among the male public [29,30]. Previous studies have also observed a lower number of men in the clientele of other psychology school clinics, with strong influences of cultural aspects of the ideal of masculinity [31,32]. Thus, the need for on-duty professionals to be prepared to adequately welcome the male patients who seek them is noted, based on knowledge about specificities of male mental health, considering that these patients may present possible discomforts associated with the exposure of their vulnerabilities to another person.

The observation regarding the income range of most study participants, from one to two Brazilian minimum wages, reinforces the social relevance of psychology school clinics in providing free psychological care to a population that cannot afford private services, and that does not find care in the overloaded Brazilian public health system [2,7,9].

Psychological care in the PES offer provides a format of care that can be performed in a single meeting and constitutes social support, so that the on-call professional is whole to meet the other in the urgency of their psychological distress, offering emotional support, as well as, if the need is identified, the opportunity to carry out up to six ES sessions, helping the individual to have a physical space to express their feelings with someone whom does not maintain an emotional bond [15]. The scientific literature on the importance of social support to promote the sense of security and well-being of individuals is highlighted, which may favor resilience in the face of adverse life events [33,34].

The relevance of PES and ES as forms of social support and resilience promotion suggests that such intervention formats may benefit different populations, from different cultural contexts, since these constructs are strongly associated with mental health in general [33,34]. Considering what the literature points out about the scarcity of emergency psychological interventions in such formats abroad, where proposals more often associated with long-term treatments are more predominantly used [15], it is suggested that PES and ES may also be grounded in psychology services outside Brazil.

As limitations of the present study, it is highlighted that the results found refer to the specific clientele of only one psychology school clinic. Therefore, new studies are suggested for a better understanding of the main complaints in PES associated with the referral to ES, with larger samples and from different psychology school clinics, in order to better qualify the care offered in such services.

5. Conclusions

It is concluded that the present study made it possible to survey the sociodemographic characteristics of the clientele assisted in PES at a Brazilian Psychology School Clinic, as well as the identification of the complaints that motivated the referral of patients to the ES modality. The research proved to be important for the definition of more precise criteria for the ES referral, based on the main demands that emerge in the PES.

The predominance of the female gender and the income range from one to two minimum wages is highlighted, pointing to the greater adherence of women to the search for psychological support and the social relevance of free services at psychology school clinics for the lower-income population, given the frequent shortage of mental health professionals in public health services.

Taking into account that depressive symptoms and difficulties in interpersonal relationships were complaints associated with higher levels of suffering, that motivated the search for the PES by the patient and the referral to ES by the on-duty professionals, it is noted that theses

factors require more attention from the Psychology School Clinics, for better qualification of the care provided.

Author Contributions

Caíque Rossi Baldassarini: Conceptualization, Methodology, Formal analysis, Investigation, Writing - Original Draft.

Naiara Alves Pereira: Methodology, Investigation, Writing - Original Draft.

Larissa Nicolau Pitta: Methodology, Investigation, Writing - Original Draft.

Marcelo Monteiro de Souza: Methodology, Investigation. Writing - Original Draft.

Caroline de Oliveira Zago Rosa: Writing - Review & Editing, Supervision.

Fernanda Pessolo Rocha: Writing - Review & Editing, Supervision.

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REVIEW

Distance Interventions for Children with Sleep Problems: A Review

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Abstract: Sleep problems in childhood are frequent and may cause damage to the children and their families; however, parental orientation appears to be effective in its many new formats, such as the distance treatment. This study aimed to review the literature about behavioral intervention performed by distance to sleep problems in childhood and summarize the main characteristics of such interventions. Searches were performed up to November 2021 in BVS Psicologia ULAPSI Brasil, SCOPUS, and PsycINFO, using the key words: sleep problems, insomnia, nighttime fears, behavioral intervention, behavioral treatment, treatment, intervention, sleep, behavior, child, children, infant, mobile phones, smartphone, app, telephone, online, internet, bibliotherapy. We included 14 studies. The main results indicate that interventions were implemented between 2 and 12 weeks, the most reported procedure was pre-sleep routines, and semi-presential interventions that required some presential contact were the most frequent. Written educational information about sleep through bibliotherapy and telephone contacts were the most used tools to implement the remote component of interventions. Ten studies indicated improvements on children's sleep, and secondary results (parental sleep and/or mental health) were also reported among studies. Therefore, our findings suggest that distance interventions for childhood sleep problems are promising, but future research is still needed.

Keywords: Sleep problems, Distance intervention, Children, Review

1. Introduction

Sleep is a fundamental physiological and behavioral process for the health of the body [1], responsible for about 40% of a child's day. However, sleep problems in childhood occur with a prevalence of 20 to 30% [2], and can negatively affect different aspects of child development [3,4].

Half of the children population have trouble falling asleep and one third wakes up several times during the night and becomes sleepy during the day [5]. These difficulties are associated with inadequate habits, such

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as lack of pre-sleep routine and parental inconsistency [6]. Resistance of children to sleep can result from nocturnal fears, such as fear of the dark, or insomnia caused by difficulties related to sleep, such as the inconsistency of pre-sleep routines, and association with the presence of parents in the moment of falling asleep [7]. This way, children who do not have a routine before going to sleep (showering, reading before going to bed, remain in a silent environment in the bedroom) may not have their sleep properly induced in appropriate time, and children who are conditioned to sleep only with the parents by their side, may experience difficulties falling asleep on their own. In this context, family members can also experience parental stress, depression, and marital maladjustment [2].

Common sleep problems in childhood are treatable, mostly with behavioral intervention through parental guidance, and effectiveness is shown in literature [2,8-10]. Behavioral interventions based on parental guidance are traditionally carried out in person, aiming to reduce inappropriate behaviors and teach adequate sleep-related behaviors. Although the literature reports effectiveness of these interventions [9,11], health professionals deal with challenges that restrict access to treatment [12]. Parental compliance occurs in 50% of cases and approximately one third is absent in the first session [13]. Thus, the characteristics of face-to-face interventions can make adherence to treatment difficult; therefore, new alternatives to involve parents in the treatment, including parental training via telephone, internet and written information, such as booklets, books or manuals have been developed [14,15].

These self-directed interventions, as interventions that do not have the physical presence of a professional during treatment, have shown results similar to face-to-face guidance regarding their effectiveness [15]. Such interventions also stand out for their flexibility, convenience, facility of access, reduction of time and cost associated with transporting participants to face-to-face meetings; therefore, distance interventions have several possible advantages compared to face-to-face interventions that can facilitate adherence to treatment and, at the same time, promote improvements in children's sleep problems [13].

Studies that address the complaint of sleep problems in children and new distance treatment modalities have already been carried out. Mindell et al. [17] investigated the caregivers' concerns about child sleep through a smartphone application, which was accessed mostly at night, when professionals are normally inaccessible. According to the authors, the high-rate use of this service, especially outside working hours, would support the interest of parents regarding information and guidance for 24 hours, and not just while the professional is present, since the night shift could be the most propitious time for the use of technology or the most susceptible time for doubts about sleep to arise [17].

There is still a shortage of reviews that studied interventions, especially distance interventions, to treat sleep problems among children. A recent systematic review that analyzed 10 studies about telehealth interventions for sleep problems among children and adolescents verified that most interventions were web-based and had a cognitive-behavioral approach to treat insomnia. Additionally, interventions focused on children were mediated by their parents, whereas adolescents engaged directly with the interventions [18]. Another similar systematic review aimed to investigate the effects of interventions that were delivered only digitally for adolescents and young adults with insomnia. Only three studies were included in the review, but the authors found evidence of effectiveness of such interventions, and they argue that this format of intervention is a promising option for treating sleep problems [19].

As noted, the few reviews on the topic included adolescents as the target population, with no review involving children only to this date. Interventions for adolescents may have different characteristics from interventions for children. Thus, there is still a gap in literature on the characteristics of remote interventions for children's sleep. Additionally, due to the prevalence and losses related to sleep problems in childhood, the relevance of better understanding new distance interventions, and the lack of previous reviews about remote interventions to treat sleep problems among children, it is relevant to review the literature about this topic.

Therefore, this study aimed to review the literature and summarize the main aspects of remote (telephone, online, bibliotherapy, etc.) behavioral interventions for children with sleep problems.

2. Materials and Methods

2.1 Search Strategy

Literature review were carried out between June and November 2015, latter the searches were updated until November 2021 in the electronic databases: BVS Psicologia ULAPSI Brasil, SCOPUS, and PsycINFO. The search descriptors should belong to one of the subgroups: (1) sleep problems (OR) insomnia (OR) nighttime fears, (AND) (2) behavioral (OR) behavioral treatment (OR) treatment (OR) intervention, (AND) (3) mobile phones

(OR) smartphone (OR) app (OR) telephone (OR) online (OR) internet (OR) bibliotherapy, (AND) (4) child (OR) children (OR) infant (OR) toddler. The searches were not restricted in language or year.

2.2 Eligibility Criteria

Exclusion criteria were: wrong population (sample with adults or adolescents); wrong intervention (pharmacological, exclusively face-to-face intervention or absence of interventions carried out at distance, not aimed at sleep problems); wrong outcome (studies that did not report sleep problems, insomnia, nighttime fears as outcome); and wrong study design (theoretical studies, literature review, abstracts or protocols without published results).

Inclusion criteria were: studies published in peer-reviewed journals; studies with a sample of children up to 12 years old; studies with behavioral, cognitive-behavioral or psychosocial interventions; studies with semi-presential or distance intervention; and studies with case report, case-control, controlled randomized trial or cohort designs.

2.3 Studies Selection Processes and Data Extraction

The stages of study selection followed the recommendations as suggested by PRISMA [16]. Thus, after the searches, duplicate studies were removed and then the studies had their title and abstract screened. Possible eligible papers had their full text assessed and then were excluded or included according with exclusion/inclusion criteria.

After the final inclusion, studies had their full text assessed. To better understand and summarize the main characteristics of studies about distance interventions for children with sleep problems, we developed a data extraction sheet containing the following elements: study identification (author, year), country of study, number of participants (n), age of participants, sleep problem addressed, intervention duration, procedures used, intervention format, instruments to assess results, and main results.

3. Results

3.1 Selection of Studies

Searches in databases resulted in 1.434 records. After duplication removal 721 records had their title and abstract screened. Of the 258 records retrieved for possible eligibility, 244 were excluded because they did not meet the inclusion criteria; therefore, 14 studies were included in the present review. Figure 1 shows the study flowchart.

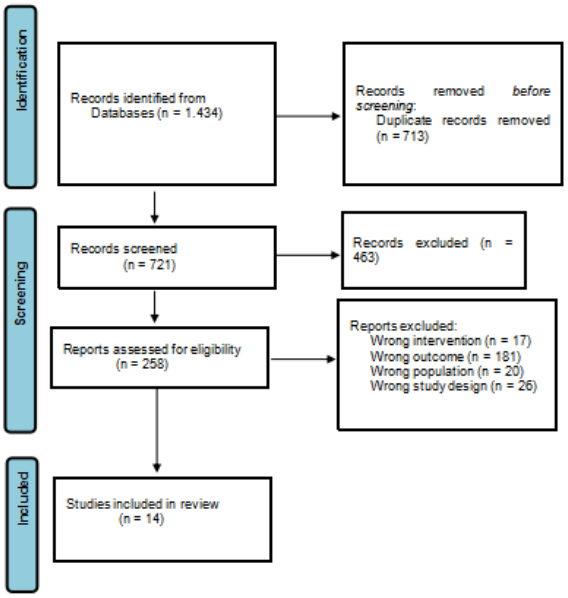

Figure 1. Study flowchart.

3.2 Studies Characteristics

The main characteristics of each included study are shown in Table 1, and the main results are described below.

3.3 Year and Country of Studies

Two studies were published between 1999 and 2003 [21,32]; two between 2004 and 2008 [20,22]; five between 2009 and 2013 [7,25,26,28,30]; and five were published from 2014 to 2018 [23,24,27,29,31].

Only one paper is from Brazil [27], one from Germany [28], one from Sweden [21], one from Israel [7], two from Australia [23,29], two from Canada [26,30], three from the United States [20, 24, 25] and three from the United Kingdom [22,31,32].

3.4 Sample of Studies

The largest sample comprised 781 children [23], whereas the study with the smallest sample size was three children [26]. Eight studies had samples with children older than 1 year old [7,20,24,26,27,29,31,32], three studies had children with less than 1 year old in their sample [22,23,30], and also three studies had their sample composed by children with less and more than 1 year old [21,25,28]. Ages from children among studies ranged from newborns [30] to 10 years old [32].

Table 1. Characteristics of studies.

Study	Country	n	Age	Sleep problem	Duration	Procedures	Format	Instruments	Results
[20] Burke et al. (2004)	USA	4	2-7 y/o	Insomnia	2-4,5 weeks	Pre-sleep routine Positive reinforcement	Bibliotherapy	Sleep diary CBCL	Decrease of disruptive behaviors to sleep, fewer awakenings during the night, improvements of behaviors during the day and good acceptance of the intervention
[21] Eckerberg (2002)	Sweden	67	4-18 months	Insomnia	3 weeks	Extinction Educational information about sleep	Bibliotherapy Face-to-face consultations Telephone	Sleep diary	Decrease in awakenings during the night
[22] Hall et al. (2006)	UK	39	6-12 months	Insomnia	2 weeks	Pre-sleep routine	Face-to-face consultations Telephone	PSQI CESD MAF MCISQ ESS DAS	Increase in parental sleep quality, humor, and knowledge about infant sleep, and decrease in fatigue
[23] Hiscock H., et al. (2014)	Australia	781	4-13 weeks	Insomnia	12 weeks	Educational sleep information Pre-sleep routine	Face-to-face consultation Bibliotherapy DVD Telephone	MCISQ EPDS	Decrease in depressive symptoms among mothers, crying, and sleep problems among children
[7] Kushnir & Sadeh (2012)	Israel	104	4-6 y/o	Nighttime fears	4 weeks	Positive reinforcement Relaxation	Face-to-face consultation Telephone	CBCL 1,5-5 y/o BCSQ Interview Actigraphy	Decrease in nighttime fears, sleep latency, and awakenings during the night
[24] Lewis et al. (2015)	USA	9	5-7 y/o	Nighttime fears	4 weeks	Pre-sleep routine Gradual exposure	Bibliotherapy Telephone Face-to-face consultation	ADIS-P What My Child Can Do at Night in the Dark PPVT-4 KFQ PAS	Decrease in nighttime fears, and increase in quantity of nights the children slept in their own bed
[25] Mindell et al. (2011)	USA	264	6-36 months	Insomnia	3 weeks	Pre-sleep routine	Online	PSQI BISQ POMS	Decrease in sleep latency and awakenings during the night among children and parents, decrease in problematic behaviors among children, increase in sleep duration and quality, and decrease in fatigue and depressive symptoms among parents
[26] Moon et al. (2010)	Canada	3	5-9 y/o	Insomnia	7-9 weeks	Positive reinforcement Gradual exposure	Bibliotherapy Telephone	CBCL 6-18 CSHQ Actigraphy Sleep diary	Decrease in sleep latency, and overall behavior problems
[27] Rafihi-Ferreira et al. (2018)	Brazil	68	4-6 y/o	Nighttime fears	4 weeks	Pre-sleep routine Positive reinforcement Gradual exposure	Bibliotherapy Telephone Face-to-face consultation	Sleep diary Interview SHIPC PAS FSSIP CBCL 1,5-5	Decrease in nighttime fears, anxiety, behavior problems, and increase in quantity of night the children slept by their own
[28] Schlarb & Brandhorst (2012)	Germany	55	8-57 months	Insomnia	6 weeks	Positive reinforcement Relaxation	Online	CBCL 1,5-5 Mini-KiSS Online Questionnaire Sleep diary	Decrease in awakenings during the night, need of parents help to fall asleep, and increase in sleep duration

Study	Country	n	Age	Sleep problem	Duration	Procedures	Format	Instruments	Results
[28] Stewart & Gordon (2014)	Australia	4	6-10 y/o	Nighttime fears	5 weeks	Positive reinforcement Gradual exposure Relaxation	Face-to-face consultation Online Telephone Bibliotherapy	CBCL 6-18 Fear Thermometer: Child and parent report FSSC-II PFQ Interview Sleep diary	Decrease in nighttime fears
[30] Stremler et al. (2013)	Canada	246	0-12 weeks	Insomnia	4 weeks	Pre-sleep routine	Face-to-face consultation Bibliotherapy Telephone	Actigraphy Sleep diary Fatigue-VAS GSDS EPDS	No changes in children or parents sleep
[31] Stuttard et al. (2015)	UK	15	1-4 y/o	Insomnia	3-10 weeks	Educational information about sleep	Face-to-face consultation Telephone	Interview	Good acceptance of treatment, but no changes in sleep data
[32] Wiggs & Stores (1999)	UK	30	5-10 y/o	Insomnia	4 weeks	Extinction Positive reinforcement Pre-sleep routine	Face-to-face consultation Telephone	Composite sleep index Actigraphy	No changes in children's sleep, but increase in parents sleep duration

3.5 Sleep Problems and Interventions

Insomnia was addressed in 10 studies [20-23,25,26,28,30-32], whereas four studies addressed nighttime fears [7,24,27,29].

The briefest interventions lasted 2 weeks [20,22], and the longest intervention lasted 12 weeks [23]. The most frequent procedure used among interventions were pre-sleep routines (n=8) [20,22-25,27,30,32], followed by positive reinforcement (n=7) [7,20,26-29,32].

Semi-presential interventions which had a remote format combined with some presential consultations was the most frequent (n=10) [7,21-24,27,29-32]. Among the resources used to implement the interventions remotely, the most frequent was the telephone (n=11) [7,21-24,26,27,29-32], followed by bibliotherapy (n=8) [20,21,23,24,26,27,29,30], and online interventions (n=3) [25,28,29].

3.6 Instruments and Results

Scales were used to measure results in 13 of the 14 included studies, only Stuttard et al.'s [31] study did not use any scale to assess results. Sleep diaries were the most frequent tool among studies (n=7) [20,21,26-30], whereas actigraphy was used only in four studies [7,26,30,32].

Ten of the fourteen studies reported improvements on children's sleep, and among the four studies that did not find significant changes on children's sleep [22,30-32], one of them reported that the new format of implemented treatment had good acceptance among participants [31], and other studies found improvements on parent's sleep [22,32]. In addition to children's sleep, four studies also reported improvements of secondary results among parents, such as, improvement sleep [22,25,32], or better mental health outcomes [22,23,25].

4. Discussion

The present study aimed to review the literature about distance interventions for children with sleep problems and summarize the main characteristics of such interventions. Only 14 studies met the inclusion criteria and could be included. This small number of studies that could be included is similar to other reviews that also investigated remotely-delivered treatments for sleep problems [18,19], and this may indicate that there is still a lack of studies on the topic.

The countries where most included studies were developed were USA and UK, and majority of studies were published in the most recent years. Sample size of studies and age from children varied greatly, ranging from 3 to 781 children aged from newborns to 10 years old. These variations of sample sizes among studies and age of participants were also found by other similar reviews. The authors of a systematic review that addressed telehealth interventions for children and adolescents with sleep problems report studies with samples ranging from 3 to 264 participants, and ages ranging from 6 months to 10 years old among the children population [18]. Similarly, Werner-Seidler, Johnston, & Christensen [19] that addressed digital cognitive-behavioral therapy for adolescents and young adults with sleep problems report study samples ranging from 26 to 96 participants aged from 12 to 34 years old.

Insomnia, defined as the difficulty of falling asleep or having night awakenings, was addressed in most included studies. This prominence of insomnia over nighttime fears

could be explained by the fact that insomnia is the most prevalent complaint about sleep problems among children [9].

Overall, interventions were relatively brief, as none of them lasted longer than 4 months; additionally, almost all interventions mixed remote components, such as telephone contacts with parents and bibliotherapy, with presential components, such as face-to-face meetings with parents. The most frequent distance components of interventions comprised telephone contacts, written educational sleep information for parents, and online interventions, respectively. Brief interventions were also identified by other reviews. Interventions lasting from 2 to 6 weeks, which had written educational information about sleep, and telephone contacts with parents were also some of the main intervention characteristics identified by McLay et al. [18]. Six to seven weeks of treatment were also reported in the Werner-Seidler, Johnston, & Christensen's study [19], but only digitally delivered, such as through web-based or mobile phone application, were included in their review.

Subjective (e.g., scales, sleep diaries, and interviews), and objective (e.g., actigraphy) measurement tools were used to assess results among studies. Scales answered by the parents were the most frequent tool used to assess results, followed by sleep diaries. Only four studies used actigraphy, a device placed in the children's finger during the night to monitor sleep patterns, to assess results. Likewise, McLay et al.,'s [18] systematic review report majority of studies using sleep questionnaires to assess results, but only half of studies assessed results through sleep diaries, and actigraphy. Self-reported scales were also the most used measurement toll used to assess results among the three studies included in the Werner-Seidler, Johnston, & Christensen's systematic review [19], but two of them, that had the same author, used actigraphy as an objective measure.

Ten studies (71,4%) included in the present review reported improvements in the children's sleep. Of the four studies that did not report such improvements, three found secondary positive outcomes, such as acceptance of treatment [31], improvements in parental sleep [22,32], or in parental mental health [22,23,25]. Only one study did not report significant changes in children or parent's sleep [30]. McLay et al.,'s [18] systematic review also found most of included studies (60%) reporting improvements in children's sleep, and although Werner-Seidler, Johnston, & Christensen's systematic review [19] included only three studies with a population older than the target population of the present review, the authors found evidence of effectiveness of treatments for sleep problems digitally delivered.

It is noteworthy that all interventions analyzed in the present review involved a parent guidance approach to teach them how to implement a pre-sleep routine that could induce and be associated with sleep, or to guide their actions at home when children expressed the resistance of going to bed. This approach involving parents seems to be the most indicated when trying to improve children's problems [2,8-10,33]. Interventions implemented remotely becomes even more interesting and relevant, as this new format provides additional benefits, such as the interventions become more easily accessible for more people, more environmentally friendly, and convenient because there is no need to travel distances to attend a clinical appointment [18]. Therefore, remote interventions could be a new feasible treatment format [13,20,31].

Some limitations of this study must be addressed, such as the shortage number of studies that could be included in the present review, the diversity of sample sizes, ages of participants, duration of interventions, and instruments used to access outcomes among studies. Alongside this diversity, it is noteworthy that each study assessed different outcomes (e.g., child sleep, children's behavior, parents' sleep, parents' well-being), which makes a quantitative analysis of the results unfeasible. Finally, the absence of a meta-analysis makes it is more difficult to draw more definitive conclusions about the real effectiveness of distance interventions for children with sleep problems.

Despite these limitations, the present review still is the only one, to our knowledge, that aimed to summarize the literature about distance interventions for children with sleep problems and provides relevant information that could help guiding future research and assist the development of future evidence-based interventions on this field. Therefore, we recommend more studies with strong designs, such as randomized controlled trials, in order to facilitate quantitative analyzes on the effects of interventions for children with sleep problems, when compared to control groups (e.g., waiting list, usual face-to-face treatment). With a greater number of quality studies, future reviews with meta-analysis may be carried out in order to reach clearer conclusions about the real effectiveness of these interventions.

5. Conclusions

Child sleep problems may lead to a lot of harm to children's development and the well-being of their caregivers [2-4]. Interventions for this problem usually involves parental guidance to teach parents and caregivers how to deal with inadequate children's behaviors when it

is time to go to bed and create a sleep routine in order to facilitate children's sleep. Such interventions have been shown to be effective in the literature [2,8-10], but a number of aspects of face-to-face treatments, such as the time spent traveling to attend the sessions, can make adherence to treatment more difficult [13-15].

Therefore, new formats of completely distance or semi-presential treatments have been developed. Usually, these distance interventions involve parental training via telephone, internet or written information [14,15]. Additionally, remote interventions have advantages when compared to face-to-face interventions, such as greater convenience and less time and cost required to attend a presential session [13]. Given these new treatments available, it is relevant to investigate and summarize the main characteristics of such interventions.

Our results show that most of distance interventions for children with sleep problems were brief, lasting from 2 to 12 weeks, and semi-presential interventions, that required at least one in-person session with the professional, were the most frequent treatment. The telephone, followed by written informations were the most used tools to implement the distance intervention. Results of studies were majority assessed through subjective measures, such as scales and sleep diaries, and 71,4% of the included studies reported some form of improvement in the children's sleep. Those studies that did not report improvements in children's sleep found secondary outcomes, such as improvements in parental sleep or mental health. Overall, these findings are in line with other similar reviews [18,19].

Still, despite the promising results that suggest improvements of children's sleep and secondary outcomes resulting from distance interventions for children with sleep problems, more studies are still necessary to the scientific evidence of this field.

Authors' Contributions

TP performed the searches, selection of studies, wrote the first draft and reviewed the paper. JS reviewed the paper. RF designed the study and reviewed the paper. EF designed the study and reviewed the paper.

Conflict of Interest

The authors declare no conflict of interest.

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Abbreviations

y/o: Years old
CBCL: Child Behavior Check List
PSQI: Pittsburgh Sleep Quality Index
CESD: Centre for Epidemiologic Studies Depression Scale
MAF: Multidimensional Assessment of Fatigue Scale
MCISQ: Maternal Cognitions about Infant Sleep Questionnaire
ESS: Epworth Sleepiness Scale
DAS: Spanier's Dyadic Adjustment Scale
MCISQ: Maternal Cognitions about Infant Sleep Questionnaire
EPDS: Edinburgh Postnatal Depression Scale
BCSQ: Brief Child Sleep Questionnaire
ADIS-P: Anxiety Disorders Interview Schedule for Children - Parent Version
PPVT-4: Peabody Picture Vocabulary Test
KFQ: Koala Fear Questionnaire
PAS: Preschool Anxiety Scale
BISQ: Brief Infant Sleep Questionnaire
POMS: Brief Infant Sleep Questionnaire
CSHQ: Children's Sleep Habits Questionnaire
SHIPC: Sleep Habits Inventory for Preschool Children
FSSIP: Fear Survey Schedule for Infants-Preschoolers
FSSC-II: Fear Survey Schedule for Children-I
PFQ: Parent Nighttime Fear Questionnaire
Fatigue-VAS: Fatigue Visual Analogue Scale
GSDS: General Sleep Disturbance Scale

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ARTICLE

The Role of Photographs and Time Lag on Positivity Ratings of Vacation and Weekend Memories

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Abstract: Two studies examined the question of whether photograph taking of an event influences the positivity of the evaluations of the event at a later point in time. Memories of photographed events yielded higher positivity ratings than memories that were not photographed. Although we expected fading of positivity ratings to occur more slowly over a period of two months for memories of photographed events, we found faster affect fading for those memories in Study 2 instead. The findings of the two studies support the idea that taking photographs of events sustains the affective reconstruction of autobiographical memories, regardless of whether these events are special, such as vacation memories, or more mundane, such as memories of the past weekend.

Keywords: Autobiographical memory; Memory fading; Memory affective positivity; Evaluation of remembered events; Photo-taking effect

1. Introduction

The role that taking photographs has in our lives seems to have changed. Decades ago, photographs functioned as a memory tool of remarkable events or experiences neatly organized in family albums. Nowadays, photographs have become snapshots or messages of everyday experiences with friends, family members, or followers on social media [1]. Rather than being mementos and markers of special events in the old days, photographs are now taken as expressions of all kinds of experiences, including everyday activities [2]. Given the breadth and frequency of experiences being photographed, these photographs may also have started to serve a different function. With so many events being documented and shared, from wedding pictures to a photograph of a fancy meal, remembering the events and their details may be too demanding on cognitive resources. This means that offloading information from the experience itself onto something tangible (i.e., a picture) may have become another function of photograph taking of events [3].

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This presumed change in function and use, along with the increased accessibility of photograph taking devices such as smartphones, and ways to share those experiences on social media, has raised the question whether and how pictures impact our affective evaluation of photographed events. One possibility is that photographed events are evaluated more positively than events that were not photographed because attention is directed toward the event being photographed which makes aspects associated with the experience more salient [4,5]. Individuals may also take photographs to be able to enjoy or reexperience the moment again when they review these photographs at a later time. This would enhance memory for the photographs. However, the opposite is possible as well. Photograph taking may serve as a distraction or disengagement for the photographer. If the focus is on the capture of the scene, rather than the experience, attention may be directed away from the event when taking a photograph with the result that the event will be remembered less well.

We were interested in differences between affective evaluations of autobiographical memories of events that were photographed at the time of the experience and memories of events that were not photographed. Now that so many events are being photographed and shared, an important question is whether photograph taking contributes to the positive evaluation of the experience. We were also interested in the role of fading with regard to the positivity of memories from photographed events versus events that were not photographed to assess the durability of the positive affect associated with the event.

Evidence for a more positive evaluation of photographed events comes from several experiments by Diehl and colleagues [4] who were interested in the question how taking photos would affect individuals' affective evaluation of their experiences. A pilot study indicated that intuitions about this issue were mixed, varying from expected increases in enjoyment, to no effect and even decreases in enjoyment. Subsequently, they tested the effect of photo taking on affective evaluations of experiences for a wide variety of events in different experimental settings, such as taking a bus tour, and events experienced in a lab environment. The results consistently demonstrated higher enjoyment of photographed events versus events that were not photographed. Their explanation of these findings is that taking photographs captures the experience, thereby focusing attention onto the experience, particularly those aspects that are worthy of a photograph. Consequently, the photographer will be more engaged and immersed in the experience and will evaluate it more positively.

Other studies have demonstrated negative effects of photograph taking in the context of attention and memory [6,7]. Henkel [6] demonstrated a photo-taking-impairment effect after participants took photographs of art objects of a museum tour (but not when they zoomed in on a detail). Soares and Storm [7] also demonstrated a photo-taking-impairment effect when participants looked at paintings and took photographs, but whether these photographs would be available later did not matter for how much they remembered these photographs (which enabled offloading of the information captured in the photograph) or not. In both studies, the act of photograph taking seems to draw the attention away from the experience and result in memory impairment because of a disruption of the experience [7].

Obviously, memory impairment effects due to photograph taking is something entirely different than a higher engagement in an event that is being photographed. It is relevant to mention those studies, however, because photograph taking of an event relates to how the event is being perceived with an affective component (positivity associated with the event) and a cognitive component (memory for the event). We could expect that when attention is indeed directed toward the event (by taking a photograph), the affective component is emphasized, hence emotions associated with the associated memory should be more salient. However, when attention is directed away from the event itself, either because the photographs serve to offload relevant information of the experience to be remembered later, or to focus on the visual capture of the event, the affective evaluation should be less salient.

To address this issue, we examined how photographed events may affect the evaluation of the autobiographical memories of these events relative to events that are not photographed. In contrast to the previous studies, the setting of the photograph taking was a real life setting when individuals take photographs spontaneously of events that they experience as part of their daily lives. Specifically, we were interested in the retrieval process of these memories from the past and how the affective evaluation of these autobiographical memories would be different for events that were photographed or not, and if this would hold for different types of events (vacation memories in experiment 1 and weekend memories in experiment 2).

Based on the discussion above, we can expect that if photographs of events are reflections of expressions of various experiences that direct attention toward the experience [5], the affective evaluation of autobiographical memories of photographed experiences should be

higher than for experiences that were not photographed. Alternatively, if photographs of events are meant to offload information of the event onto something more tangible, or if photograph taking disengages the person who takes the photograph from the experience due to distraction, then photographed events will be remembered more poorly or reacted to more negatively than events without photographs [7] .

In addition to the role of photograph taking of events and how this may affect the retrospective affective evaluation of these autobiographical memories, we were interested in how durable the positivity associated with these past events would be. Fading of emotions associated with autobiographical memories is a well-documented phenomenon. This so-called *fading affect bias* holds that memories associated with negative emotions fade faster than memories associated with positive emotions [8-10]. The underlying mechanism for this bias is the result of adaptive behavior that allows individuals to keep a positive outlook on life [8,10] in which the salience of positive emotional memories is sustained to a greater extent compared to negative recollections [11].

We explored if differential fading would occur in the current studies for different types of autobiographical memories, such as generally positive memories for the past summer vacation versus more neutral memories from the past weekend. When these memories are evaluated over time, we can expect fading in positivity of the evaluation of the autobiographical memories to be slower for events that happened during a summer vacation compared (because they tend to be more positive) to the events that happened during the past weekend (because they tend to be more neutral).

Photograph taking may play a role in this differential fading process as well. Diehl and colleagues [4] demonstrated less fading in enjoyment for photographed events than events that were not photographed when questioned again later (30 minutes later and a week later) even though the participants could not revisit these photographs. In this light, taking photographs would be considered adaptive behavior, as it enhances our ability to keep this positive outlook on life. In the current study, we therefore expected less fading in positivity ratings for memories from photographed events compared to events that were not photographed. Differences with the Diehl et al. study [4] were that we employed a real-life setting of a vacation or weekend, and chose a much longer time lag, two months, versus 30 minutes or a week. A longer time lag resembles a more natural interval between photo taking and revisiting the photographs later in real life. Another major difference between our studies and the studies by Diehl and colleagues is that we focused on remembering the events and the role of photographs on the positivity associated with the retrieval of these events, whereas Diehl and colleagues only studied whether the act of taking photographs or not had an impact on the experience itself without focus on the associated memory.

The current study examined the role of photograph taking and the passing of time on the positivity with which recent autobiographical memories were evaluated. This was examined in two studies in which memories of past vacation events (Experiment 1) and past weekend events (Experiment 2) were recorded. To assess the fading of effect in the evaluation of memories, affective evaluations of these memories were assessed twice: once during initial retrieval (Session I) and once two months later (Session II). Experiment 2 served as a conceptual replication of Experiment 1 with a different instruction (prior instruction instead of no prior instruction), type of event (weekend experiences instead of vacation experiences) and a shorter initial time lag (a day instead of the past summer vacation) relative to the original experience.

Hypothesis 1 predicted that positivity ratings for photographed memories should be higher than for memories that were not photographed, suggesting that photograph taking results in directing attention toward the event rather than away from it. Hypothesis 2 predicted less fading in positivity for memories of photographed than for not photographed events due to the attention being drawn to the initial experience which should have sustained the emotion one felt during the experience. These hypotheses were tested in both experiments. In addition, the authors performed exploratory analyses and on the combined data set to address the question whether positivity ratings would differ between vacation memories and weekend memories. Moreover, a potentially different role of fading in relation to the type of memories and photograph taking could be explored in the combined data set. Differences in fading in positivity of memories from the summer vacation relative to memories of weekend events would suggest differences in the time course for the affective evaluation of different types of events.

2. Experiment 1

2.1 Materials and Methods

The study complied with the requirements from the Ethics Committee of the Erasmus University prior to the data collection and guidelines from the Declaration of Helsinki regarding good research practices. All participants provided written consent.

Participants were recruited from the research participant pool from the university and received two research credit hours for their participation in the two waves of the experiment. A total of 100 participants took part in phase I of the experiment (97 participants remained in phase II). Mean age was 20.17 (SD = 2.41) years, 86% being female. Participants were assigned randomly to a photograph upload and a control condition (50 students in each condition).

Participants in the photograph upload condition were instructed to write down five memories from their past summer vacation and to select and upload an accompanying picture of each memory from their smartphone on a private protected internet site. Thus, these participants were explicitly instructed to use photographs in their memory retrieval process. Participants in the control condition received the same instructions to write down five memories from their past summer vacation (see Appendix A for specific instructions). The difference from the photograph condition was that they did not get the information in the last part of the instruction to select or upload an accompanying picture of the memory from their smartphone.

We manipulated two variables. The first variable was the photograph manipulation (reporting a memory with or without an accompanying photograph). The second independent variable was time lag (session I versus session II). This yielded a mixed design. The dependent variable was the positivity rating of the vacation memories, reported on a sliding scale (How positive/negative was the event when you first experienced it, from 0 = very negative to 100 = very positive). Ratings were analysed for participants (mean ratings over five memories, N = 97) and memory items (unit = memory provided, N = 456).

Participants came to the lab for a study to answer questions about their smartphone (this was done to make sure they brought their smartphones) and to write their memories from their past summer vacation. They first provided written consent, answered questions about their smartphone and wrote five memories about their past summer vacation on a protected internet site with a minimum of 50 and a maximum of 100 words for each memory. Participants in the photograph upload condition wrote down five vacation memories, uploaded an accompanying picture from their smartphone onto the protected site (that was removed later), then evaluated the positivity of the event. From the instruction, they knew they had to retrieve memories from events that were photographed (for instructions see Appendix A). Participants who were assigned to the control condition, wrote down five memories about their past summer vacation, indicated if they had taken a photograph of this event (this question was redundant in the photograph condition) and evaluated the positivity of the event. Participants in both conditions also answered other questions (e.g. regarding their smartphone) to not have the exclusive focus on the positivity of the event but these questions were not considered here.

All participants came to the lab in the same period, early October, which meant that their summer vacation memories were similarly remote, around 1.5-2 months. For session II, (early December), participants returned to the lab, read the verbatim description of the memories they reported earlier (but participants in the photograph upload condition did not see their photographs) and evaluated the positivity of these memories again. They were debriefed and thanked.

After inspection of the written memories, it became clear that some participants did not adhere properly to the instructions of reporting vacation memories from the past summer vacation because they reported memories from a previous summer vacation. These older memories were removed (23 out of 479 memories) as the time lag would be different for those memories. The remaining data (N = 456) for the memory analyses consisted exclusively of memories from the past summer vacation.

2.2 Results

The first hypothesis was that the positivity ratings would be more positive in the photograph upload than in the control condition (Hypothesis 1) for both the participant and memory item analyses. We also expected a condition by time interaction with a smaller effect of fading of positivity in the photograph upload than in the control condition (Hypothesis 2). The analyses were conducted with participants as a random factor ($_{part}$) and test items (memories) ($_{item}$) as a random factor. The 2 (condition: photograph upload versus control) by 2 (time: session I versus session II) mixed model ANOVA indicated a main effect of time, $F_{part}(1, 91) = 8.63$, $p = .004$, $\eta^2 = .086$, [95% CI 76.12-82.76 session I, 73.80-80.43 session II] F_{item} ① $(1, 436) = 5.75$, $p = .017$, $\eta^2 = .013$, [95% CI 77.26-82.07 session I, 75.16-79.47 session II], a main effect of condition, $F_{part}(1, 92) = 5.95$, $p = .017$, $\eta^2 = .061$, [95% CI 69.72-78.93 control, 77.73-86.74 photograph upload], $F_{item}(1, 436) = 13.36$, $p < .001$, $\eta^2 = .030$, [95% CI 71.32-77.55 control, 79.50-85.60 photograph upload], but no time by condition interaction, $F_{part}(1, 92) = .689$,

① We controlled for the nesting of memories within participants in the analyses as there were five memories per participant.

p = .409, η^2 = .007, F_{item} (1, 436) = 1.32, p =.252, η^2 = .003). Confirming Hypothesis 1, positivity ratings were higher in the photograph upload than in the control condition both in the participant and memory item analyses. Moreover, positivity of the memories faded from session I to session II, but this happened regardless of whether photographs were taken of these events and uploaded or not, yielding no support for Hypothesis 2.

When we examined the answers to the question in the survey in the control condition whether the event was photographed or not, we observed that many of these memories were also photographed (131 memories). Given that this outcome could not have been prevented because participants retrieved these memories spontaneously without the instruction to upload a photograph, we performed an additional exploratory analysis to compare positivity ratings of autobiographical memories of photographed events with positivity ratings of autobiographical memories that were not photographed within the control condition. Note that photographed memories in the control condition were different from those in the photograph condition in the previous analysis because memories were not selected and uploaded from available photographs on the smart phone. This exploratory analysis was conducted as a within-subjects factor in the memory item analysis only because some of the five memories that had to be reported were photographed and some were not. The 2 (photographed versus not photographed) by 2 (session I versus session II) mixed model ANOVA showed a main effect of photograph taking on the positivity of the remembered event, F_{item}(1, 190) = 20.77, p <.001, η^2 = .099 [95% CI no-photograph 57.07-69.79, photograph 76.98-86.02] but no main effect of time, F_{item}(1, 190) = .828, p =.364, η^2 = .004, nor a time by photograph interaction, F_{item} (1, 190) = .069, p =.793, η^2 < .001. Again, the results support the hypothesis that memories of photographed events are evaluated more positively than memories of events that are not photographed. This is remarkable because the memories were not cued by the selection and upload of a photograph but solely cued by the instruction to retrieve a memory from the past summer. The difference from the photograph upload condition was that positivity ratings in this exploratory analysis remained stable from session I to session II. Hence, Hypothesis 2 was not supported.

Together, the results from the comparisons of positivity ratings of autobiographical memories from photographed events or events that were not photographed confirm Hypothesis 1. This hypothesis predicted higher positivity ratings for autobiographical memories that were photographed (uploaded or not) than memories that were not photographed, supporting the idea that taking photographs directs attention towards (positive aspects of) the experience, rather than drawing attention away from the event. Moreover, positivity ratings faded over a period of two months in the whole data set (but not the subset of the no-photograph condition), but this fading was not moderated by photograph taking as predicted in Hypothesis 2. This hypothesis was not supported.

3. Experiment 2

Experiment 2 was conducted as a conceptual replication of Experiment 1 to determine if the results regarding the positivity of autobiographical memories would hold if an explicit instruction for taking photographs (similar to [4]) was given prior to the experience of events to be reported and evaluated later. In contrast to the evaluation of summer vacation memories, selection issues in this design would be minimized. A second reason for this conceptual replication was to see if the positivity effect for photographed and uploaded events from autobiographical memories relative to memories from events that were not photographed would hold for more neutral everyday memories. A third reason was to be able to compare data of two different experiments in a combined data set to examine differences in affective evaluation over time between vacation and weekend memories.

The hypotheses for experiment 2 were the same as in experiment 1, higher positivity ratings in the photograph upload versus the control condition and a time by condition interaction, suggesting less fading in positivity in the photograph upload relative to the control condition.

3.1 Materials and Methods

The study complied with the requirements from the Ethics Committee of the Erasmus University prior to the data collection and guidelines from the Declaration of Helsinki regarding good research practices. All participants provided written consent.

Participants were recruited from the research participant pool from the university (but could not participate in this study if they had already participated in Experiment 1) and received two research credit hours for their participation in the two waves of the experiment. A total of 93 participants took part in session I of the experiment; 79 participants remained in session II. Mean age was 19.76 (SD = 2.62) years with 91% women participating. Participants were assigned randomly to a photograph upload (53%) and a control (47%) condition.

Participants were notified before a previously set

weekend that they were to report five memories from events that they experienced the upcoming weekend on Monday. Half of the participants received the additional instruction to photograph these events, half of the participants did not receive this additional instruction. The e-mail notification also contained the consent form they had to sign and return. On Monday, participants wrote five memories from the past weekend in the online questionnaire and evaluated them on their positivity. Participants who were assigned to the photograph upload condition, uploaded the photographs on a private protected site. If they were in the control condition, they indicated if the event they had written about had been photographed or not.

In session II, two months later (same delay as in Experiment 1), participants received another link with a verbatim description of their memories they submitted earlier. They were asked to evaluate them again on their positivity. Similar to Experiment 1, participants in the photograph upload condition only saw the verbatim description of the event, not their photographs.

A difference from Experiment 1 was that participants reported and evaluated their autobiographical memories online at home in session I and II instead of in the lab. It was not feasible to have this large number of participants visit the lab on the same day (Monday after the weekend or two months later) which necessitated this online procedure.

After inspection of the memories, one participant did not adhere properly to the instruction of reporting memories from the past weekend. From the description it was obvious that one of the memories was from an earlier weekend and therefore this memory was removed from the dataset.

The study had a mixed factorial design with condition (photograph upload versus control) as a between-subjects factor and time lag (session I versus session II) as a within-subjects factor. The dependent variable was the positivity rating of the memories during session I and session II.

3.2 Results

Similar to Experiment 1, the first hypothesis was that the positivity ratings would be more positive in the photograph upload than in the control condition (Hypothesis 1). We also predicted a time by condition interaction with a smaller effect of fading of positivity in the photograph upload than in the control condition (Hypothesis 2).

The analyses were conducted with participants as a random factor (*part*) and test items (memories) (*item*) as a random factor (the latter while controlling for the nesting of memories within participants).

The 2 (time: session I versus session II) by 2 (condition: control versus photograph upload) mixed model ANOVA demonstrated a main effect of time for the participant analysis, $F_{part}(1, 76) = 16.78$, $p < .001$, $\eta^2 = .181$, [95% CI 69.11-75.31 session I, 65.81-71.74 session II], but not the memory item analysis, $F_{item}(1, 384) = 2.61$, $p = .107$, $\eta^2 = .007$, a main effect of condition in the memory item analysis but not the participant analysis, $F_{part}(1, 76) = 3.63$, $p = .061$, $\eta^2 = .046$, $F_{item}(1, 384) = 4.94$, $p = .027$, $\eta^2 = .013$, [95% CI 64.02-71.09 control, 69.64-77.15 photograph upload], and a significant time by condition interaction, $F_{part}(1, 76) = 8.55$, $p = .005$, $\eta^2 = .101$, $F_{item}(1, 384) = 10.15$, $p = .002$, $\eta^2 = .026$. Positivity ratings of autobiographical memories were more positive in the photograph upload than the control condition in the memory item analysis as predicted, fading occurred over time in the participant analysis, but unexpectedly, fading of positivity from session I to session II occurred to a greater extent in the photograph upload condition than in the control condition.

Similar to Experiment 1, we performed an additional exploratory memory item analysis comparing photographed and not photographed memories in the control condition. Again, a distinction was made between memories that were not photographed (135 memories) versus memories that were photographed (67 memories) in the control condition. There was no main effect of time, $F_{item}(1, 199) = 2.64$, $p = .608$, $\eta^2 = .001$, but there was a main effect of photograph, $F_{item}(1, 199) = 24.23$, $p < .001$, $\eta^2 = .109$, [95% CI 56.22-65.50 no photograph , 74.14-87.59 photograph], and no time by photograph interaction, $F_{item}(1, 199) = .352$, $p = .554$, $\eta^2 = .002$. Photographed memories were evaluated more positively than memories that were not photographed in the control condition, but the effect remained constant over time.

Together, these results confirm Hypothesis 1 that predicted higher positivity ratings for autobiographical memories that were photographed (uploaded or not) than memories that were not photographed, supporting the idea that taking photographs directs attention towards (positive aspects of) the experience, rather than drawing attention away from the event. Hence, we replicated the findings from Experiment 1 to the extent that the effect was only demonstrated in the memory item analyses. Similar to the findings from Experiment 1, the exploratory analysis showed that photographed memories in the control condition were evaluated more positively than memories that were not photographed.

Similar to experiment 1, fading occurred when comp-

aring positivity ratings of memories from events in the photograph versus no-photograph condition, but this only happened in the participant analysis. In contrast to Experiment 1, a condition by time interaction for the positivity ratings was found, however, but only for the upload photograph condition which was in the contrary direction than predicted. We will discuss these unexpected findings later.

3.3 Combined Data Experiment 1 and Experiment 2

With the combined data set we explored whether higher positivity ratings would occur for vacation memories than for weekend memories and a differential role of fading in relation to the different types of memories and photograph taking. The 2 (experiment: vacation versus weekend memories) by 2 (condition: photograph upload versus control) by 2 (time: session I versus session II) repeated measures ANOVA showed a main effect of experiment, $F_{part}(1, 168) = 12.23$, $p = .001$, $\eta^2 = .068$, [95% CI 75.32-81.24 vacation, 67.24-73.74 weekend], $F_{item}(1, 821) = 11.74$, $p = .001$, $\eta^2 = .014$, [95% CI 76.09-82.09 vacation, 66.51-73.08 weekend], a main effect of time $F_{part}(1, 168) = 24.76$, $p < .001$, $\eta^2 = .128$, [95% CI 73.54-78.12 session I, 70.69-75.20 session II], $F_{item}(1, 821) = 8.35$, $p = .004$, $\eta^2 = .010$, [95% CI 74.04-77.68 session I, 71.35-74.70 session II], a main effect of condition $F_{part}(1, 168) = 9.18$, $p = .003$, $\eta^2 = .052$, [95% CI 67.94-74.09 control, 74.62-80.89 photograph upload], $F_{item}(1, 821) = 16.06$, $p < .001$, $\eta^2 = .019$, [95% CI 68.66-73.37 control, 75.48-80.26 photograph upload], and a time by condition interaction, $F_{part}(1, 168) = 7.20$, $p = .008$, $\eta^2 = .041$, $F_{item}(1, 821) = 9.48$, $p < .001$, $\eta^2 = .011$ but no other interactions. Positivity ratings were higher for vacation than weekend memories, and for photographed and uploaded events compared to events in the control condition, but not in interaction with photograph taking. Similar to the outcomes of experiment 2, the overall data set also demonstrated more fading in positivity in the photograph upload condition when compared to the control condition.

The higher positivity ratings for the vacation than the weekend memories and photographed events suggest that holiday memories are evaluated more positively than weekend memories but did not demonstrate an effect of photograph taking in relation to the type of event. The findings therefore cannot answer our questions regarding the role of photograph taking in relation to different types of events (vacation or weekend). With regard to fading of positivity, ratings of memories that were photographed and uploaded resulted in faster fading than events in the control condition.

4. Discussion

This paper examined the role of photograph taking in the affective evaluation of vacation and weekend memories using two naturalistic experiments. Our hypotheses predicted that photographed memories would be evaluated more positively than memories that were not photographed (Hypothesis 1), and that the positivity of photographed memories would fade less over time than that of memories of events that were not photographed (Hypothesis 2). We also explored the role of type of memory (vacation versus weekend) in the combined data that allowed for a comparison of positivity and fading for vacation versus weekend memories in relation to photograph taking.

The first hypothesis was supported in both experiments and in the combined data set, although the effect of photograph taking with upload was only demonstrated in the memory item analysis of the weekend experiment. Overall, it appears that taking a photograph of an event and uploading it, be it a special event from a summer vacation or a weekend event, directs attention toward the experience when the event is retrieved from memory and sustains the positive emotion associated with the event. This effect was replicated in the exploratory analyses among the photographed memories in the control condition that were not uploaded. This suggests that taking a photograph during the initial experience is a meaningful act for the affective evaluation for later retrieval and contributes to the higher positivity ratings of the event. The effect was found in two different experiments that involved different types of memories, differences in prior instructions, and different time intervals for the initial report of the memories, hence do not support the idea that photograph taking results in offloading information or distraction because, in that case, positivity ratings of autobiographical memories of photographed events would not be higher than those in the control condition. Rather, the emphasis is on the experience itself when photographed and appears to be enjoyed once again when the experience is retrieved later.

The second hypothesis predicted that the positivity of memory ratings of photographed events would fade less over a period of two months than of events that were not photographed. This hypothesis was not supported as no condition by time interaction occurred for the positivity ratings in Experiment 1 and a different interaction pattern than expected occurred in Experiment 2 (and for the combined data set). Why was fading more pronounced for positivity ratings of weekend events in the photograph upload than in the control condition and for the combined

data set? An answer could be that there was a heightened focus on the memory and details surrounding the memory when it was uploaded as part of the experimental procedure. In contrast to the vacation experiment, participants in the weekend experiment knew beforehand they had to take photographs of weekend experiences. When they had to upload the photograph after the weekend as part of the memory description, the focus of the experience was on the combination of the photograph and the experience including the emotions they felt at the time of the event. This may have contributed to the higher positivity rating of the event compared to the control condition. When they had to evaluate the description (and not the photograph) of this experience two months later, the photograph upload experience that was salient during their first retrieval, was lacking, along with the emotions they felt at that time, possibly because the photograph taking was the result of an instruction and not a spontaneous action. This may have contributed to faster fading of positivity in the photograph upload condition relative to the control condition. The fact that faster fading of positivity did not occur for photographed events in the control condition, supports this assumption, as photographs were taken spontaneously, without previous instruction. Another reason that there was no fading effect could be that rereading their earlier written report after two months could have revived their memory independent of the photograph upload experience. This does not explain, however why a time by condition interaction effect occurred in the weekend experiment and the combined data set as all participants reread their verbatim description (irrespective of condition). To rule out the effect of rereading the earlier report, future research could explore other cues to re-evaluate the memory rather than the verbatim description of the memory.

Faster fading of positivity in photographed and uploaded memories contradicts the findings from Diehl et al. [4] who demonstrated that enjoyment of photographed events faded more slowly over time (30 minutes and a week later) than enjoyment of events that were not photographed. However, the time lag in this study was relatively short compared to our study where the time lag covered two months which may explain the difference. Also, the events being photographed in the Diehl et al. [4] experiments were part of pre-selected experiences with photograph instructions that all participants took part in, not events that participants experienced in a natural setting as was the case in our study. Even though vacation memories were evaluated more positively than weekend memories, which can be expected based on the longer, and more positive time-period to select from, no interaction with photograph taking was found. Photograph taking thus seems to reflect documentation of all kinds of experiences [2] when examined in a naturalistic environment [4] and seem to leave a positive trace when remembered later. Compared to the Diehl et al.'s experiments [4], our design lacked control which can be considered a limitation of our studies given that participants made the selection of what to report and photograph from a larger variety of events themselves.

To gain deeper insight into the importance of uploading photographs of events, the type and content of the autobiographical memories should be examined in future research, along with the extent to which these memories can be retained in memory. Research has shown differential findings in memory impairment for photographed events depending on what is being photographed, the whole object or details [6], and whether the photograph remains available or not [7].

5. Conclusions

It can be concluded that memories of photographed events are evaluated more positively when retrieved than events that are not photographed. Photographs therefore serve an important function in sustaining the emotion associated with the event. When the event is retrieved as a memory, attention is directed toward the event being photographed which makes aspects associated with the experience more salient. In other words, if you quickly want to savor positive events in your memory, you should take a photograph of them!

Authors' Contributions

First author: Katinka Dijkstra - study design, data organization, data analysis, writing the paper;

Second author: Keri Pekaar - study design, data organization, data analysis, substantial feedback on the paper;

Third author: Jacky Hooftman - study design, feedback on the paper;

Fourth author: Yvette van Osch - substantial feedback on the paper.

Conflict of Interest

The authors declare no conflict of interest.

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Appendix A

Instruction Experiment 1 Photograph upload condition

In the textbox below, write down an experience from your summer holiday (with a minimum of 50 words, and a maximum of 100 words). The experience should be a memory of something you were personally involved in and it should be about something that took place over a period of minutes or hours (but not days or a recurring event). It does not matter whether the memory describes something important or boring. The main thing is that it is a memory of an event you experienced and took a photograph of with your smartphone. You should write it down as a coherent story, not in the form of key words. After you write down the experience, email the matching photograph from your smartphone to yourself, then upload it onto the dedicated location in this questionnaire. If you have trouble doing this, contact the experiment leader.

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