EFFECT OF FLOWER ESSENCE THERAPY ON TEACHERS' STRESS: A RANDOMIZED CLINICAL TRIAL

EFEITO DA TERAPIA FLORAL NO ESTRESSE DOCENTE: ENSAIO CLÍNICO RANDOMIZADO

EFECTO DE LA TERAPIA FLORAL EN EL ESTRÉS DOCENTE: ENSAYO CLÍNICO ALEATORIZADO

- Rogelia Herculano Pinto¹
- Sebastião Manoel de Sousa²
- Carlos Renato dos Santos³
- Sueli Moreno Senna¹
- Luciana Pedrosa Leal⁴
- Eliane Maria Ribeiro Vasconcelos⁴

¹ Universidade Federal de Pernambuco - UFPE, Centro de Ciências da Saúde- CCS, Enfermagem. Vitória de Santo Antão, PE - Brazil.

² UFPE, CCS, Educação Física. Vitória de Santo Antão, PF - Brazil

³ UFPE, CCS, Saúde Coletiva. Vitória de Santo Antão, PE - Brazil.

⁴ UFPE, CCS, Enfermagem - Recife, PE - Brazil.

Corresponding author: Rogelia Herculano Pinto E-mail: rogeliaherculano@gmail.com

Authors' Contributions:

Data Collect: Sebastião M. Sousa; Funding Acquisition: Eliane M. R. Vasconcelos, Rogelia H. Pinto; Methodology: Luciana P. Leal; Project Management: Eliane M. R. Vasconcelos; Statistical Analysis: Carlos R. Santos, Luciana P. Leal; Writing - Original Draft Preparation: Rogelia H. Pinto; Writing - Review and Editing: Sueli M. Senna, Eliane M. R. Vasconcelos.

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ABSTRACT

Objective: to evaluate the effectiveness of Bach flower essences in reducing teachers' stress levels. Method: a controlled, randomized, and double-blind clinical trial with a prospective design. In data collection, a form validated in the light of Betty Neuman's theory and another three instruments were used, one in the perceptive perspective (PSS-14), the second in the prevalence of the signs and symptoms (LSS), and the third for the evaluation of the bio-electrographic aspects (FAAB). The sample consisted of 27 teachers from the basic education network, with medium and high levels of stress and divided into two groups: intervention group (IG), the one that received Bach flower essences, and placebo group (PG). Results: the IG proved to be effective in reducing stress, being statistically significant intra-group with the decrease in the mean scores of PSS-14 (p=0.004), LSS (p=0.000), and bioelectrography (p=0.011); as well as between groups with a p-value of 0.035 for LSS, and FAAB with p=0.001. Conclusion: the Bach flower essences proved to be effective in the care of teachers' stress with the re-structuring of the flexible line of defense, reflecting in a better relationship between the teacher and intra-, inter-, and extra-personal stressors. This study is registered in the ReBEC under UTN N° U1111-1208-4987. Keywords: Stress, Psychological; Nursing Care; Flower Essences.

RESUMO

Objetivo: avaliar a efetividade das essências florais de Bach na redução dos níveis de estresse docente. Método: ensaio clínico controlado, randomizado, duplocego, com delineamento prospectivo. Foram utilizados na coleta de dados um formulário validado à luz da teoria de Betty Neuman e três instrumentos, um na perspectiva perceptiva (PSS-14), o outro na prevalência dos sinais e sintomas (LSS) e um de avaliação dos aspectos bioeletrográfico (FAAB). A amostra foi constituída de 27 professores da rede básica de ensino com estresse médio e alto, distribuídos em dois grupos: intervenção (GI) e que recebeu floral e placebo (GP). Resultados: o GI mostrou-se efetivo na redução do estresse, sendo estatisticamente significante intragrupo com a diminuição das médias dos escores do PSS-14 (p=0,004, LSS - p = 0,000) e da bioeletrografia (p=0,011); bem como entre grupos com p-valor de 0,035 para LSS e FAAB com p= 0,001. **Conclusão:** as essências florais do sistema Bach mostraram-se efetivos no cuidado do estresse docente com a reestruturação da linha flexível de defesa, refletindo melhor relacionamento do professor com os estressores intra, inter e extrapessoais. Este estudo está registrado no ReBEC com o nº. UTN: U1111-1208-4987.

Palavras-chave: Estresse Psicológico; Cuidados de Enfermagem; Essências Florais.

RESUMEN

Objetivo: evaluar la efectividad de las esencias florales de Bach para reducir los niveles de estrés del personal docente. Método: ensayo clínico controlado, aleatorizado, doble ciego con diseño prospectivo. En la recogida de datos se utilizó un formulario validado a la luz de la teoría de Betty Neuman y tres instrumentos: uno en la perspectiva perceptiva (PSS-14), otro en la prevalencia de signos y síntomas (LSS) y otro para la evaluación de aspectos bioelectrográficos (FAAB) La muestra consistió en 27 profesores de educación básica con estrés medio y alto, divididos en dos grupos: intervención (GI), que recibió esencias florales, y placebo (GP). Resultados: el GI demostró ser efectivo para la reducción del estrés, siendo estadísticamente significativo dentro del grupo con disminución en las puntuaciones medias del PSS-14 (p = 0.004, LSS - p = 0.000) y bioelectrografía (p = 0.011); así como entre grupos con un valor de p de 0.035 para LSS y FAAB con p = 0.001. **Conclusión**: las Flores de Bach demostraron ser efectivas en el manejo del estrés de los docentes con la reestructuración de la línea flexible de defensa, reflejando una mejor relación entre el profesor y los estresores intra, inter y extrapersonales. El presente estudio está registrado en ReBEC bajo el nº. UTN: U1111-1208-4987.

Palabras clave: Estrés Psicológico; Atención de Enfermería; Esencias Florales.

INTRODUCTION

The consequences of continuous stress were investigated by Hans Selye (1936), who called them a "general adaptation syndrome", the result of the exhaustion of the organism in a non-specific response of the body to any demand, whether caused by or resulting from favorable or not favorable conditions. From Selye's studies, other researchers contributed to the understanding of stress and came to the conclusion that psycho-emotional events activate neurons for the production of the corticotrophin (CRF) and arginine vasopressin (AVP) hormones in the hypothalamus; however, the activation degree depends on the reaction to the moment experienced by the person.²

Among the professions considered to have the greatest burden of work stress is that of a teacher.^{3,4} In addition to being constant learners, teachers handle social demands of a neo-liberal capitalist model.⁵ This model leads to incompatibility between the teacher's personal limits and the complexity of the contemporary school setting.⁶

The reality of the teachers who teach in elementary school and, in particular, in the public school system, has undergone social and economic changes that are interfering with their quality of life. The feeling of devaluation, the increase in violence, inadequate physical structures, reduced teaching resources, and the complexity and speed of information are leading teachers to a state of continuous and intense stress. 5-9

In this perspective, the teacher's health is of fundamental importance in the school community, which makes the search for

strategies that minimize stressful factors and improve their quality of life relevant, facts that justified this study. Foreseeing the school as a scenario for health promotion represents a space for care and for the work of nurses.

This research is important for the field of Nursing knowledge, as it presents Nursing care from a more comprehensive and cost-effective perspective. It took place in the school scenario, confirming the importance of the nurse's work also in this space. In addition, it proves to be innovative for working with health education based on the flower essence therapy in the care of the individual, inserted in a proposal for health promotion based on the immersion in the reality of these teachers in a horizontal dialog, supported by a theoretical model of Nursing.

The different types of care are the essence of Nursing, which, in turn, has developed theories and models to assist in a systematic and quality care. Nursing theories and models help nurses understand the disease process. And among the Nursing theories, the theoretical model of open systems by Betty Neuman favors the understanding of intra-, inter-, and extra-personal stressors and adjusts to the study of teachers' stress.

In this context, it is necessary to rethink care models that can minimize the consequences of the lifestyle based on the production system that values capital at the expense of the human being. There is a need for holistic care proposals that confront the model based on the disease and not on the patient. The World Health Organization (WHO) encourages the Member States to create and implement public policies for the rational and integrated use of other models of care that respect human beings in their biopsychosocial and spiritual needs.¹²

The WHO designated this set of practices and knowledge as Traditional, Complementary and Integrative Medicines (TCIMs). In Brazil, it is known as Integrative and Complementary Health Practices (*Práticas Integrativas e Complementares em Saúde*, PICS), with its common principle being the perception of the individual as an integral human being.¹³

Among the PICS, the therapy with flower essences created in the 1930s by the English physician Edward Bach based on wild flowers stands out. There are 38 essences prepared with a therapeutic purpose and property intended to balance emotional problems, harmonizing the person with the environment in which they live.^{14,15}

This research proves to be relevant for seeking an answer to the problem of teachers' stress, anchored in a theoretical model that clarifies the problem and systematizes its service.

In view of the above, this study proposes to evaluate the effectiveness of the Bach flower essences on teachers' stress in the light of Betty Neuman's theoretical model of open systems.

This article is part of the doctoral thesis entitled: Effectiveness of the flower essence therapy of the Bach system on teachers' stress in the light of Neuman's theory in the Nursing Post-Graduate

Program of the Centro de Ciências da Saúde of the Universidade Federal de Pernambuco.

METHOD

This is a double-blind randomized clinical study. To determine the sample, the prevalence of teachers' stress in the city was initially sought. Thus, seven schools were randomly selected, totaling 292 teachers from the 591 registered at the Local Education Secretariat.

In this first moment, the Perceived Stress Scale (PSS-14) was applied to the teachers from the selected schools after a meeting with the board and the faculty. PSS-14 is an instrument validated in more than 20 countries, which allows determining the extent to which life events are perceived as inducive of stress. From the 292 teachers who work in these schools, 143 participated in that moment and answered the instrument. The cut-off point for inclusion in the study was \geq 28 points, which is equivalent to the perception of stress at a medium level. A prevalence of 37% was found, which estimated approximately 218 individuals with medium to high stress, from the 591 registered teachers.

From this result, and taking into account the evaluation of the effect for a 5% significance level and 80% power for a paired T-test, the sample was calculated in 35 individuals.

From the 143 teachers evaluated by PSS-14, 54 were considered eligible. Of these, 43 were selected and randomized into two groups. There were 22 teachers in the intervention group (IG) and 21 in the placebo group (PG). During the study, both groups had losses: nine in the PG and five in the IG. Thus, 29 teachers remained in the study. We believe that some losses in the PG occurred because

the individuals did not feel any improvement in their symptoms and did not return to the appointments, so we were unable to get feedback from them; others were due to sick leave and holidays. In the IG, losses were due to the bonus leave, change of city, and holiday period (Figure 1).

The inclusion criteria for participation in the study were the following: being active in the profession for at least two years and not using any other treatment for stress. The minimum working time was based on another study, which identified that the stress level is related to the time working as a teacher.¹⁸ The exclusion criteria adopted were the following: teachers on sick leave or on holidays, or those who were exercising other positions in the school.

Four instruments were used for data collection, described below. The Teacher Stress Assessment Form (Formulário de Avaliação do Estresse do Professor, FAEP) guided the appointments from the perspective of Betty Neuman's open systems model and was validated in content and appearance in 2017, which allowed for systematization and data collection, identifying the types of stressors involved.¹⁹ The other three were used to assess the effects of the flower essence therapy, namely: PSS-14, the List of Stress Signs and Symptoms (LSS), and the Bio-electrographic Aspects Assessment Form (Formulário de Avaliação dos Aspectos Bioeletrográficos, FAAB).

PSS-14 has 14 items, seven of which have a positive connotation; the other seven have a negative connotation. The total scale is the sum of the scores, which can vary from zero to 56 points, categorized into four scores: zero to 13 (very low perceived stress); 14 to 27 (low perceived stress); 28 to 42 (mean perceived stress); and 43 to 56 (high perceived stress). The LSS consists of 59 items and

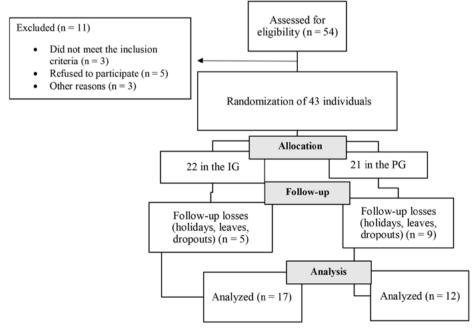


Figure 1 – Diagram representing the flow of the participants in each stage of the study as recommended by CONSORT 201017. Vitória de Santo Antão (PE), Brazil, 2019

assesses the frequency of the referred symptoms using a Likert-type scale, where (0) is never, (1) rarely, (2) frequently, and (3) always. The stress level is measured from the score, where the minimum is equal to or less than 10, and the maximum is 177 points. A low stress level is considered to be a score between zero and 66, mean between 67 and 122, and high from 123 to 177 points.²⁰

To measure the evolution of the energy field of the emotional aspects of the study participants, bioelectrography was used. Bioelectrography is an auxiliary diagnostic technique that allows identifying characteristics of the energy field related to the physiological and psychological states photographed at the moment the individual is examined.²¹ The bio-electrographic equipment photographs the gases that sparkle from the surface of animate and inanimate bodies when subjected to the action of a high-frequency and high-voltage electric field. It enables to capture a halo around the human finger composed of several elements (colors, brightness, and shapes), which are used to assess the individual's psycho-emotional and biological state.^{21,22}

The machine used for the photograph corresponds to the Newton Milhomens Kirlian type, with the following features: 220 V power supply, voltage: 6.5 Kv at the H mark, exposure time of four seconds, recommended film brand: Fujicolor, which were developed and digitized by Varela Fotografias Ltda. in the city of Recife-PE. The images were taken before the appointment to prevent the individual's emotional state from changing during the conversation with the flower essence therapist.

To assess the bio-electrographic images, an instrument already validated in Brazil was used: the Bio-electrographic Aspects Assessment Form (FAAB). This form assesses the presence and the intensity level of the following aspects: emotional conflicts, feelings of anger, feelings of sadness, feelings of disappointment, feelings of regret, Yin/Yang energetic balance, self-destructive tendencies, energy losses/fatigue, vitality, concerns, and anxiety. These emotional aspects are represented in each image, and each of them has its own score ranging from zero to four points, categorized as follows: 0 = absent, 1 = mild (0-25%); 2 = moderate (25-50%); 3 = high (50-70%), and 4 = intense (>75%). Thus, this instrument was analyzed as follows: if the emotional category was greater than zero, it was considered present, scoring 1, which would eventually result in a score between zero and 11 points, with zero considered balanced and 11 considered a greater state of imbalance. From this reasoning, the means of the groups were obtained.

Double-blind was considered for the nurse responsible for the intervention (flower essence therapist) and for the voluntary participants. The data collection period included three appointments, with a 21-day interval between subsequent appointments. However, the treatment continued until discharge. The mean time of treatment was nine weeks, based on the study by Oliveira²³.

The prescription of essences followed Bach's guidelines,²⁴ whose active listening guided the selection of up to six flower essences,

among 38 existing ones. The essences chosen corresponded to the negative emotions present in the statement of the individual assessed by the FAEP. In this way, each individual received a personal and individualized formula at each new appointment.

After the appointment, the teachers were referred to receive the bottle in another room with the first research assistant. The preparation of the bottles containing the essences followed Bach's guidelines²⁴ and the dilution of the flower essences strictly followed the technical guidelines of the Brazilian Association of Pharmacists and Homeopaths.²⁵ The PG received a bottle identical to the IG, containing only mineral water and additives. Both groups were instructed to take four drops sublingually four times a day.

For data analysis, the SPSS Statistics software, version 21.0 with double entry was used. The homogeneity between the IG and PG groups was assessed using sociodemographic and occupational characteristics. The normality of the distributions of the continuous variables (age, hours worked per day in the classroom, and weekly hours worked in other academic activities) was assessed using the Shapiro-Wilk test and, with respect to the age variable, the T-test was used. The categorical variables were assessed using Fischer's exact test, and the stressors presented by the teachers were assessed using the means of intra-, inter-, and extra-personal stressors identified by the FAEP.

The mean scores of the PSS-14, LSS, and FAAB instruments had normal distribution, and mixed analysis of variance (ANOVA) with repeated measures was adopted to compare the means of the intra- and inter-group (intervention and control) scores. The correlation between the distributions of the LSS and PSS-14 scores, in the three evaluated moments, was made using Pearson's correlation coefficient and all the conclusions were drawn considering the 5% significance level.

This research was approved by the Research Ethics Committee of the Health Sciences Center at the Federal University of *Pernambuco* (CEP/CCS/UFPE), CAAE: 61374916.4.0000.5208 and is also included in the Brazilian Registry of Clinical Trials under UTN number: U1111-1208-4987.

RESULTS

The teachers interviewed had a medium stress level, were between 37 and 44 years old, worked in more than one school, with a mean daily load of eight hours in the classroom and another six and a half hours outside the classroom weekly, in addition to their household chores.

The IG and PG groups were homogeneous for all the variables, since there was no statistically significant difference regarding age (p=0.3788), hours worked per day in the classroom (p=0.8346), hours worked outside the classroom (p=0.5768), number of schools where the teacher works (p=0.12), vocational training (p=0.204), and financial incomes (p=0.621).

Among the twenty five types of stressors that can be identified through the FAEP, a mean of 10.86 was found in the sample, distributed in 7.6 intra-personal, 1.4 inter-personal, and 1.9 extra-personal stressors. Regarding the effectiveness results, Figure 2 shows a reduction in the mean of the PSS-14 scores. The PG has initial PSS-14 mean scores of 32.4 points (classified as medium stress), decreasing to 28.6 in the second moment; and, in the third, it showed a mean value of 29.5, remaining in the same classification, with no statistically significant difference (p=0.341). The IG showed initial PSS-14 mean scores of 35.7, also classified as medium stress, subsequently dropping to 29.1 and then to 27 points (p=0.000), classified as low stress.

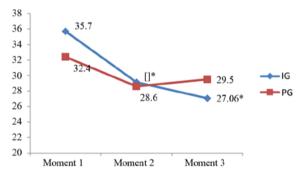


Figure 2 - Behavior of the mean scores of the PSS-14 variable in the intervention and placebo groups. *Vitória de Santo Antão* (PE), Brazil, 2019
*p-value (<0.05).

IG = Intervention Group; PG: Placebo Group; PSS-14: Perceived Stress Scale.

The means of the LSS scores over time are shown in Figure 3. The IG showed a constant and significant decrease from 78.2 to 64.4 and, in the third moment, to 57.7, with a statistically significant reduction (p=0.000).

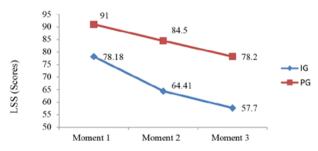


Figure 3 - Behavior of the mean scores of the LSS variable in the intervention and placebo groups. *Vitória de Santo Antão* (PE), Brazil, 2019 *p-value (<0.05).

 $\label{eq:Gamma} IG = Intervention \ Group; \ PG: \ Placebo \ Group; \ LSS: \ List \ of \ Stress \ Symptoms.$

Figure 4 visually exposes the effectiveness of the flower essence therapy when the IG was compared to the GP by means of the FAAB. There was a reduction from 5.24 to 3.77 (p=0.004) in the scores of the negative emotional aspects for the IG group. The same effect was not observed in the PG (p=0.991).

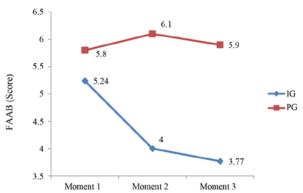


Figure 4 - Behavior of the mean bioelectrography (FAAB) scores in the intervention and placebo groups. *Vitória de Santo Antão* (PE), Brazil, 2019
*n-value (<0.05).

IG = Intervention Group; PG: Placebo Group; FAAB: Bio-electrographic Aspects Assessment Form.

The mean values of the PSS-14, LSS, and FAAB variables over time are indicated in Table 1, showing the effectiveness of the intra-group flower essence therapy. Moment 1 indicates the initial appointment, just as moments 2 and 3 indicate the two subsequent appointments. It can be seen that, between moment 1 (M_1) and moment 2 (M_2), the IG shows a significant reduction of the values in the three variables: PSS-14: 18.6% (p=0.0004); LSS: 17.7% (p=0.000); and FAAB: 23.7% (p=0.011). The same was not observed in the PG in this period. This effect remained over time when the moments between M_1 and M_3 were compared, eventually showing a total reduction of 24.3% for the mean scores of PSS-14 (p=0.000), 26.2% for LSS (p=0.000), and 28.05% in the FAAB (p=0.0004).

Table 2 shows the differences in the mean LSS, PSS-14, and FAAB scores in the three moments between the IG and PG groups. It is perceived that there is no statistically significant difference between the groups in the three variables in the first moment, which demonstrates the initial homogeneity between the groups. A reduction was observed from M_1 to M_2 for LSS (p=0.035) and a tendency (p=0.056) of M_2 to M_3 . The FAAB evidenced reductions in both moments, 2 and 3, with p=0.001 and p=0.001. Regarding the PSS-14 variable, no differences were found.

Over time, a correlation was observed between the mean scores of PSS-14 and LSS. In the second moment, there was a moderate positive correlation, with r=0.671 (p=0.003), and an increase of this relationship to strong in the third moment, with r=0.788 (p=0.000), in both instruments. The same was not observed in the PG (Figure 5).

DISCUSSION

The sociodemographic and occupational data collected in this study ratify what other research studies discuss about the working conditions to which the Brazilian elementary and middle school teacher is subjected. The precariousness of the teacher's

Table 1 - Comparison between mean, difference (Diff), and percentage (%) of the PSS-14, LSS, and FAAB scores in the three moments, in the intervention (IG) and placebo (PG) groups. Vitória de Santo Antão (PE), Brazil, 2019

		Moment (score means)			M ₂ -M ₁			M3-M1		
					Diff.			Diff.		p- value
PSS - 14	IG	35.77	29.12	27.06	-6.64	-18.6	0.004	-8.7	-24.3	0.000
	PG	32.40	28.6	29.5	-3.8	-11.7	0.386	-2.9	-8.95	0.341
LSS	IG	78.18	64.41	57.7	-13.8	-17.7	0.000	-20.47	-26.2	0.000
	PG	91	84.5	78.2	-6.5	-7.14	0.312	-12.8	-13.2	0.060
FAAB	IG	5.24	4.00	3.77	-1.24	-23.7	0.011	-1.47	-28.5	0.004
	PG	5.8	6.1	5.9	+0.300	+5.17	0.912	0.1	1.64	0.997

^{*}p-value according to t-Student, PSS-14 – Perceived Stress Scale; LSS – List of Stress Symptoms; FAAB – Bio-electrographic Aspects Assessment Form; M_1 – Moment 1; M_2 – Moment 2; M_3 – Moment 3.

Table 2 - Comparison between the differences in means and standard deviation of the scores of the LSS, PSS-14, and FAAB instruments between the IG and PG groups at the three moments. Vitória de Santo Antão (PE), Brazil, 2019

Variable	Moment	PG (mean ± Standard Deviation)	IG (mean ± Standard Deviation)	Differences of the means between PG and IG	p- value *
LSS	M1	91.00±6.34	78.17±4.86	-12.824	0.122
	M2	84.50±7.14	64.41±5.47	-20.088	0.035
	M3	78.20±8.12	57.70±6.23	-20.494	0.056
PSS-14	M1	32.40±1.42	35.76±1.09	-3.365	0.072
	M2	28.60±2.18	29.11±1.67	-0.518	0.853
	M3	29.50±1.62	27.05±1.24	-2.441	0.244
FAAB	M1	5.80±0.413	5.23±0.317	-0.565	0.288
	M2	6.10±0.460	4.00±0.353	-2.100	0.001
	M3	6.90±0.429	3.76±0.329	- 2.135	0.001

*p-value according to t-Student. PSS-14 – Perceived Stress Scale; LSS – List of Stress Symptoms; FAAB – Bio-electrographic Aspects Assessment Form; M₁ – Moment 1; M₂ – Moment 2; M₃ – Moment 3.

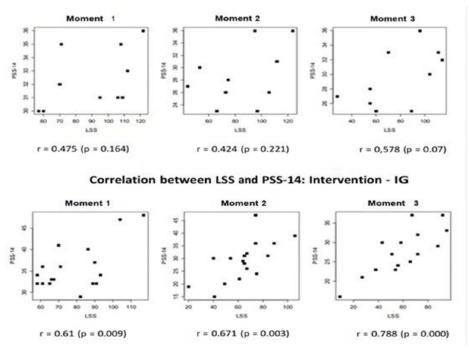


Figure 5 - Correlation between the PSS-14 and LSS variables in the IG and PG groups. $Vit\'{o}ria de Santo Antão$ (PE), Brazil. 2019 *Pearson's correlation; PSS-14 - Perceived Stress Scale; LSS - List of Stress Symptoms; M_1 - Moment 1; M_2 - Moment 2; M_3 - Moment 3.

work, characterized among other factors by long working hours, lack of continuing education, vulnerable work situation, precarious structural conditions, and lack of teaching materials, contributes to their illness.²⁴⁻²⁸

Bach flower essences proved to be effective, with a constant reduction in the stress levels during the studied period, mainly from the first to the second moment. Additionally, despite the apparently lower effect from the second to the third moment, the stress levels remained lower, indicating that these individuals did not return to their previous condition, which confirms the results of other studies. The study by Botelho and Sorato²⁸ used a mixture with three flower systems (Bach, Australian, and Californian) in treating the stress of university professors and observed a mean reduction of 42.86% in the stress levels.

The flower essences provided a more realistic self-perception of the individual, and this effect was analyzed from the results found in the positive correlation between the perceived stress values (PSS-14) and the prevalence of signs and symptoms (LSS). This effect was the result of the action of the flower essences, providing greater opening of the individual's consciousness, according to the writings of Edward Bach.²⁴ This result corroborates the rationality of the flower essence therapy: the positive change of consciousness is the instrument that will make the individuals change their behavior and/or adapt to the new conditions without becoming ill; from there it is that the healing process is established.³⁰ This change in behavior was also demonstrated by the reduction in the mean FAAB scores, which portrays the reduction in the negative emotional aspects.

Flower essence therapy also contributed in the context of health education, as it provided a horizontal relationship between the nurse and the patient, based on the valorization of speech, necessary for establishing priorities, identifying the causes of illness, and selecting the essences that helped the patient in the self-knowledge process, leading to self-care. Flower essence therapy can be an important and aggregating practice for nurses who already possess active and qualified listening.

Some limitations were found while developing this research. The main one was the difficulty reconciling the available hours of the volunteers with the method. Another limitation was the local educational context, with management problems that led to a strike in the category. This made it impossible to recruit new volunteers to replace those who did not remain in the study. The final limitation was the difficulty to find other similar studies for comparison.

CONCLUSION

This study concluded that the therapy with flower essences from the Bach system is effective in reducing teachers' stress levels. Betty Neumann's theory contributed to determining the causes of the teachers' illness by identifying the stressors based on the FAEP, enabling the selection of the flower essences. This theory also clarified the understanding of the personal process of illness from the interrelation of the individuals with themselves, with their interpersonal relationships, and with the environment.

This understanding allows identifying the stressors involved in this process, as well as the negative emotions which arise in this relationship, granting a more assertive prescription of essences. In addition, it strengthens Nursing care linked to integrative and complementary practices. This is a research that can contribute to a care proposal, which can be replicated not only in the school setting, but in any other health care space. It proposes a comprehensive care based on flower essence therapy, which can influence the social aspect, empowering people to better deal with the events of daily life, with positive repercussions on their quality of life.

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