


**MANAGING PSYCHOLOGICAL STRESS OF UNIVERSITY STUDENTS  
THROUGH YOGA PRACTICE: AN INTEGRATIVE REVIEW** <https://doi.org/10.56238/sevened2024.030-012>**Uitairany do Prado Lemes<sup>1</sup>, Laís Peres Anael<sup>2</sup>, Gustavo Carvalho Marcelino<sup>3</sup>, Cezimar Correia Borges<sup>4</sup>, Paula Correa Neto Santos<sup>5</sup> and Gusthavo Ribeiro Silva<sup>6</sup>****ABSTRACT**

**Introduction:** High levels of stress in university students are associated with psychological distress and can affect their academic performance. Mind-body exercise modalities such as yoga apparently produce effects on the management of stress symptoms and consequently, psychological distress. **Objective:** This study aims to present scientific productions on the effects and implementation of yoga practice programs in the management of psychological stress in university students. **Methodology:** This is an integrative review of the PEDro, LILACS, Web of Science and Pubmed electronic databases. 10 experimental studies were selected for discussion. **Results/Discussion:** It was evidenced that practicing yoga is cost-effective in the management of student stress. The most researched modality is Hatha Yoga and although significant, the effect size of the stress interventions ranged from moderate to small. There are still some gaps in the intensity and proportion of movements and meditation that would potentially show better results, and more research is needed on the topic. **Final Thoughts:** Implementing yoga into the academic curriculum can be a favorable coping strategy for the stress associated with higher education.

**Keywords:** Yoga. University Student. Mental health. Psychological Stress.

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## INTRODUCTION

College students are particularly susceptible to experiencing high levels of psychological stress. The most common predictors of stress in this population are: individual, environmental, and coping factors. Personality trait such as neuroticism is an example of individual factors. Living situation, social support, and campus resources are examples of environmental factors. And coping refers to the strategies that individuals use to manage stress and negative emotions 1.

A cross-sectional study conducted in 2020 investigated depression, anxiety, and stress rates among Spanish students. In a sample of 1,074 university students, 34.5% had moderate levels of stress, among the factors associated by the authors, the following stand out: problematic behavior with internet use, smoking, low self-esteem, being a woman, alcoholism and poor eating habits. In their conclusions, the authors highlighted the need for interventions to promote mental health among university students<sup>2</sup>.

Brazilian epidemiological studies show high levels of stress among university students. Demonstrating a prevalence of 73.3% self-perceived stress through the Adult Stress Symptom Inventory (LIPP) among nursing students<sup>3</sup>. In this population, stress was associated with factors such as age and marital status. Another study found an even higher rate using the Stress Perception Scale (EPS-10) demonstrating 76% of moderate to high stress associated with the consumption of substances such as alcohol, tobacco and other drugs<sup>4</sup>.

There is a growing interest in the literature in the use of mind-body approaches to manage stress in a healthy way. Alternatives such as yoga and meditation have constantly been suggested to reduce self-reported stress and stress biomarkers, as well as increase mindfulness and self-compassion<sup>5</sup>. Although there is a lot of enthusiasm in research on the mechanisms by which yoga practice acts on the minds and emotions of practitioners, there is no consensus on the results on the outcome of stress<sup>6</sup>.

The objective of this study is to perform an integrative literature review in order to present the effects of yoga practice and the implementation of practice programs on the psychological stress of university students. It is hoped that this review will contribute to the understanding of the practice and provide subsidies for future research and interventions aimed at coping with the stress associated with the academic context.

## METHODOLOGY

The literature review, even if of the integrative type, was structured based on the recommendations of the PRISMA checklist - Preferred Reporting Items for Systematic



Reviews and Meta-Analysis. Four databases were consulted: Physiotherapy Evidence Database (PEDro), Latin American and Caribbean Literature on Health Sciences (LILACS), Web of Science, and United States National Library of Medicine (PUBMED). The search took place in the first half of 2024, with no limitations on language or place of publication.

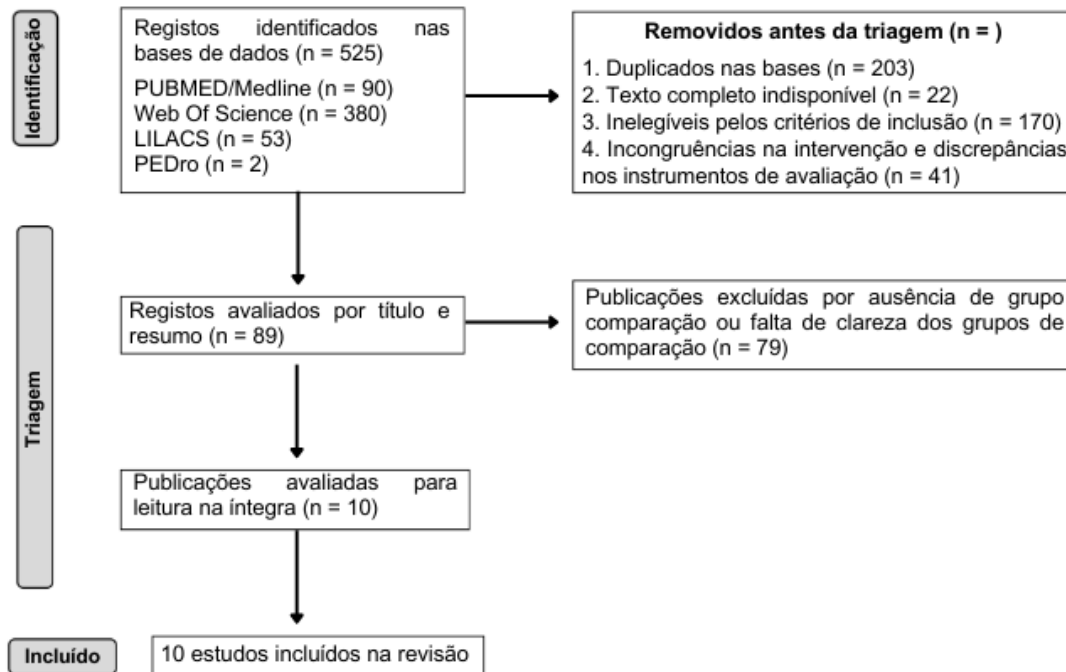
The research strategy was delimited based on the PICOS tool (P= Population: university students aged 18 years or older; I= Intervention: submitted to Yoga-based training in the management of self-reported stress, anxiety, and depression; C= Comparison: comparison between exposed and unexposed groups; O= Outcome/outcome: effects of yoga programs on university stress management). The searches in the databases occurred after the authors defined the guiding question of the review: "Would the practice of yoga be an effective and efficient non-pharmacological alternative in the management of self-perceived psychological stress in university students?"

Pre-established descriptors were used, consulted in the Health Sciences Descriptors (DeCS / MeSH): "Yoga – Yoga"; "Stress" and "College Students". The terms were applied in both English and Portuguese by two independent authors who applied the same strategies and discussed the need for consensus in the choice of included articles.

The inclusion criteria were defined based on categories, namely: (i) study design, (ii) sample, (iii) intervention and comparison, (iv) outcomes evaluated by self-report instruments, and (v) year of publication. Experimental studies with samples of university students that compared the effects of yoga practice to control groups or other intervention modalities for psychological stress evaluated with self-report instruments, published between January 2014 and September 2024, were included.

The exclusion criteria determined were: Duplicate studies in the consulted databases, articles that combined medications with non-pharmacological approaches and/or yoga, study protocols, pilot studies of clinical trials that did not have a comparison group. The flowchart shown in Figure 1. presents the stages of optimized searches in the databases, which resulted in the inclusion of 10 articles selected according to criteria established in the review.

Figure 1. PRISMA Flowchart (2020)<sup>7</sup>



## RESULTS

The summary of the results of the selected studies is available in **Table 1**. 10 intervention studies were selected, seven of which were controlled clinical trials and three experimental studies without randomization, which examined the effects of yoga practice on the psychological stress of university students. The total number of participants in the 10 studies included in the review is 1,481 with ages ranging from 18 to 25 years. The intervention time between the studies ranged from 06 to 12 weeks.

As shown in **Table 1**, the interventions with *Yoga* varied in modality and time of intervention. In all studies, the intervention through *yoga* was administered by a certified and experienced instructor. The management model was mostly face-to-face, but two studies made online interventions. Each study applied a varied amount of postures consistent with the *yoga* modality and the practices associated with each modality.

The modalities of *yoga* practice mentioned among the selected studies were: Hatha *Yoga*<sup>8, 9, 10, 11, 12, 13, 14, 15</sup>, Kundalini *Yoga*<sup>16</sup> and Kripalu *Yoga*<sup>17</sup>.

The Hatha *Yoga* modality, also known as "Classical *Yoga*", corresponds to the application of breathing techniques associated with psychophysical postures within a certain sequence and closure with meditation or relaxation. In addition to varied movements, this modality has certain sequences such as greetings (sets of 12 or more

movements repeated for a certain time). Within the practice of Hatha Yoga there are also philosophical practices, songs and purification practices.

Kundalini Yoga is derived from classical Yoga and is a form of Yoga that involves chanting, chanting, breathing exercises, and repetitive postures to promote a heightened state of consciousness. Finally, the Kripalu Yoga modality is a modality also derived from classical yoga and the classes consist of a brief didactic overview of yoga theory and techniques, meditation, diaphragmatic breathing, warm-up exercises, yoga postures of gentle to moderate intensity and a final relaxation practice.

Table 1: Summary of the selected studies. Goiânia – GO, 2024.

Author/year	Objectives	Methods	Results
Kim, 2014	To evaluate the effects of 12 weeks of Yoga under stress and glycemic parameters in 27 nursing students	GY: ( <i>Hatha Yoga Group</i> ) received intervention for 12 weeks, once a week 60-minute classes CG (Control group): Received no intervention. Pre- and post-12-week evaluations for both groups using the following instruments: SLS (stress) and digital glucometer (blood glucose)	There were significant differences between the groups over time for the stress outcome (Yoga vs. control, $p < 0.001$ ). The yoga group had a reduction in the LSS scores in the time and group interactions. There were significant differences between the two groups in postprandial blood glucose (yoga group vs. control group, $p < 0.001$ ). There was a reduction in the IG blood glucose level in relation to the CG before and after the 12-week intervention.
Falsafi, 2016	Compare the effectiveness of Yoga vs. Meditation vs. Meditation Control in coping with depression and stress in 90 university students	GY ( <i>Hatha Yoga Group</i> ), GM (Mindfulness Group) and CG (Control), with 75-minute interventions, 1 time a week, for 8 weeks. Evaluations before and after 08 weeks and a 12-week follow-up for the three groups by the instruments: BDI (depression), SAH (anxiety), SLSI (student stress), SCS (compassion), CAMS (mindfulness)	Both intervention groups (Yoga and Mindfulness) achieved improvements in stress, anxiety, and depression scores relative to the control group (no intervention) ( $p < 0.01$ ) on the 8-week pre- and post-intervention measures. There appeared to be no differences between GY and GM, except for the levels of self-compassion that were higher in the GM and were maintained after a 12-week follow up.
Park <i>et al.</i> , 2017.	To examine the feasibility and differential efficacy of cognitive behavioral stress management (CBSM) and yoga for physical and mental health of 34 college students.	Study with three groups: GY ( <i>Kripalu Yoga Group</i> ), GCC (Cognitive Behavioral Therapy Group) and CG (Control Group). 8-week interventions with weekly 60-minute sessions. Pre- and post-intervention assessments of 08 weeks and a follow-up of 24 weeks. For the three groups, the following instruments were used: DASS-21 (depression, stress and anxiety), DERS (emotional regulation), BSCS (self-control), MAIA-VB2 (interoceptive awareness).	There were no significant differences within or between the groups comparing baseline and the 8-week post-intervention and at the 24-week follow-up for the outcomes: stress, depression, anxiety. There were significant differences pre- and post-intervention at 8 weeks within the GY and GCC for emotion regulation ( $p = 0.054$ ; $p = 0.026$ ), and only in the GY for interoceptive awareness ( $p = 0.026$ ). There were no changes within the CG. At follow-up, GY increased emotion regulation and reduced impulsivity. The GCC and CG did not show differences



Gorvine <i>et al.</i> , 2019.	To compare the effects of yoga vs. mindfulness on self-compassion, mindfulness, and perceived stress in 92 college students;	GY (Vinyasa Yoga Group) and GM (Mindfulness Group) received 10 weeks of intervention. Pre- and post-intervention assessments for both groups by the instruments: PSS-10 (perceived stress), MAAS (mindful attention), SCS-SF (self-compassion).	There was no significant difference between the groups in the outcome stress ( $p=0.38$ ), self-compassion ( $p=0.18$ ), and mindfulness ( $p=0.45$ ) However, the study indicated that individuals with higher levels of self-compassion showed more significant reductions in stress.
Papp <i>et al.</i> , 2019.	To investigate the short-term effects of high-intensity <i>hatha yoga</i> (HIY) exercise on depression, stress, and sleep quality of 44 college students.	The GY ( High <i>Intensity Yoga</i> Group) and CG did not receive intervention, but were advised to continue with routine physical exercises. Pre and post-intervention evaluations of 06 weeks by the instruments HADS (depression), PSS (perceived stress), PSQ (sleep quality), ISI (insomnia).	There were no statistically significant differences between the groups for the outcomes stress, anxiety, depression, sleep, or self-rated health. However, the outcomes analyzed within the IG itself comparing baseline with post-intervention assessments, demonstrated that higher doses of high-intensity yoga were associated with lower depression scores and better sleep quality.
Tong <i>et al.</i> , 2021.	To examine the effects of <i>yoga</i> and fitness exercises on stress and the underlying mechanisms in two periods: acute effect: (immediately) and the chronic effect (after 12 weeks). 191 college students	GI (Hatha Yoga Group) GC (Fitness Exercise Group). The study was carried out in two stages: Acute and chronic effects of the intervention. Assessments for acute effects after 60 minutes of intervention and assessment for chronic effects after 12 weeks. For both groups in the two stages in the pre and post-intervention moments: DASS (depression, anxiety and stress), MASS (conscious attention), SPANE (positive and negative experience), ELISA (salivary cortisol).	Acute effects: Significant differences in interaction between group and time (pre- and post) for stress and mindfulness, demonstrating a significant reduction in stress ( $p<0.001$ ) and increased mindfulness ( $p<0.001$ ), immediately after yoga class and marginal (non-significant) outcome for fitness exercise ( $p>0.005$ ). Chronic Effects: Between-group and time-to-group interactions for stress and mindfulness were significant The follow-up analysis revealed a non-significant reduction in stress after a yoga class and a significant increase in stress levels in the exercise group. Not significant increase in mindfulness in GY but significant reduction in EG. No differences in salivary cortisol at all times of the study.
Gao <i>et al.</i> , 2022	To investigate the efficacy of a yoga intervention combined with aromatherapy in reducing stress and improving sleep quality in 89 female college students.	GY (Hatha yoga group) and GYA (yoga + lavender oil aromatherapy). Pre- and post-intervention assessments of 12 weeks using the following instruments: PSS-14 (perceived stress), PSQI (sleep quality).	There was no significant difference in stress or sleep levels between the groups, but there was a difference in the results of a sleep disorder PSQI subscale. There was an improvement in stress scores in both groups, with a large effect size (0.15). There was no improvement in sleep in the GY and there was a marginal improvement in the GYA, but also not significant.
Chang <i>et al.</i> , 2022.	To assess the impact of short <i>online Upa Yoga</i>	GI (received Upa Yoga with two modalities, <i>Namaskar Yoga</i> and <i>Nadi Shuddhi</i>	The IG showed significant stress reduction and improved well-being in students, group-time interaction

	sessions on the mental health and well-being of 679 college students during the COVID-19 pandemic.	through 25-minute videos) CG (No intervention/waiting list) The control group received no intervention for the first 4 weeks and then participated in 8 weeks of practice. Pre- and post-intervention assessments during 12 weeks using the instruments: PSS-10 (perceived stress), PANAS (positive and negative affect), PHQ-4 (patient health), BRS (resilience).	demonstrated significant difference in stress between groups and a moderate effect size on stress between intervention and control groups during the study period.
Brandão <i>et al.</i> , 2024.	To examine the effectiveness of an <i>online Kundalini Yoga</i> intervention on psychological functioning in 106 college students.	GI ( <i>Kundalini Yoga</i> via Zoom for 60 minutes weekly), GC1 (autogenic relaxation for 0 minutes weekly), and GC2 (no intervention). Pre and post 06 weeks evaluations by the instruments: DASS-21 (depression, anxiety and stress), SCS (self-compassion), ICAC (self-concept), DERS (emotional regulation), SWBQ (spiritual well-being)	In the stress outcome, the results showed a significant main effect, only in the comparison between baseline and post-intervention time, but there were no differences between the groups, and there was, therefore, no group effect or interaction effect between time and group. Secondary outcomes indicated that GI improved self-compassion, extrinsic affect, and personal and community spiritual well-being compared to active and passive CG1 and GC2.
Castelote-Caballero <i>et al.</i> , 2024	To analyze the effectiveness of a yoga-based intervention in reducing stress, improving emotional well-being, and decreasing state-anxiety and trait-anxiety in 129 college students.	GI (Hatha yoga for 02 weekly sessions of 60 minutes) and CG (did not receive intervention). Pre and post 12-week assessments using the following instruments: PSS (stress), WEMWBS (mental well-being) and STAI (state-trait anxiety).	There were significant differences in group-time interaction over time, but not in group. The study demonstrated significant between-group differences in the post-intervention measures with a small effect size for the outcome stress, emotional well-being, and anxiety. The IG experienced significant reductions for the outcomes analyzed compared to the CG.

Legenda: LSS: Life Stress Score. BDI: Beck's Depression Inventory . SLSI: Student Life-stress Inventory. SCS: Stress-induced cognition scale. CAMS: Cognitive and Affective Mindfulness Scale. DASS-21: Depression Anxiety Stress Scale. DERS: Difficulties in Emotion Regulation Scale. BSCS: Brief Self-Control Scale. MAIA-VB2: Multidimensional Assessment of Interoceptive Awareness. HADS: Hospital Anxiety and Depression Scale. PSS: Perceived Stress Scale. PSQ: Pittsburgh Sleep Quality. ISI: Index: Insomnia Severity Index. MASS: The Mindful Attention Awareness Scale. SPANE: Scale of Positive and Negative Experience. ELISA: Enzyme-Linked Immunosorbent Assay. PANAS: Positive and Negative Affect Schedule PHQ-14: Patient Health Questionnaire. ICAC: Inventário Clínico de Auto-Conceito .. SWQ: Spiritual Well-Being Scale. WEMWBS: The Warwick-Edinburgh Mental Wellbeing Scale. STAI: The State-Trait Anxiety Inventory

Of the authors who used the Hatha Yoga modality, four reported the sequence of surya Namaskar, this series is composed of a set of 12 movements, namely: pranamasana, hasta utthanasana, padahasthasana, ashwa sanchalanasana, parvatasana, Ashtanga Namaskara, Bhujangasana, Ashwa Sanchalanasana, Padahasthasana, Hasta Utthanasana, Pranamasana <sup>9, 11, 12, 14</sup>.

Two authors did not mention which movements they used in the intervention <sup>8, 17</sup>. One study carried out blocks of free classes with variations of postures without obeying any



sequence<sup>10</sup>. And another study used free sequence, adopting three blocks of distinct movements applied in alternate weeks<sup>15</sup>. All authors associated the movements with breathing exercises and meditation/relaxation at the end.

The authors who used the Kundalini yoga modality detailed their intervention in six steps that consisted of: chanting, breathing exercises, determined postures (they did not mention which ones), relaxation, meditation, and closing with chants again<sup>16</sup>.

The instruments used to assess stress levels in the population of university students were self-report questionnaires, the main ones being: Life Stress Scale for University Students, Student Life Stress Inventory, Anxiety and Depression Stress Scale (DASS-21), Perceived Stress Scale<sup>8, 9, 10, 11, 12, 13, 14, 15, 17, 16</sup>.

The groups used as a comparison to yoga modalities to investigate the effects on the outcome of stress were: Control groups (without any intervention)<sup>8, 11, 12, 15, 17</sup>, (Cognitive Behavioral Therapy (CBT)<sup>17</sup>, Mindfulness<sup>10</sup>, Physical conditioning exercises<sup>13</sup>, Hatha Yoga associated with aromatherapy<sup>14</sup> and autogenic relaxation<sup>16</sup>.

The practice of face-to-face yoga showed superior effects in reducing stress scores when compared to Control Groups, i.e., groups that did not receive any intervention during the study period<sup>8, 9, 11, 12, 15, 16, 17</sup>, or physical conditioning exercises<sup>13</sup>; similar results when compared to practices based on meditation or psychosocial therapies such as, Mindfulness<sup>8, 10, 17</sup> and CBT<sup>17</sup>, as well as yoga associated with aromatherapy<sup>14</sup>.

The application of online yoga practice interventions presented results similar to face-to-face interventions, with better results when compared to control groups<sup>9</sup> and indifferent results in the group-time relationship when compared to psychosocial modalities<sup>16</sup>.

## DISCUSSION

Apparently, an important element in stress management involves including a perception of consciousness between the mind and body, because in all the results favorable to the reduction of stress levels among university students, mental practices were highlighted.

Stress was a psychological measure constantly associated with other variables in the evaluations of the included studies, and most studies evaluated other mental health outcomes associated with stress as the primary outcome of the investigation<sup>13, 16, 17</sup>. Secondary outcomes such as emotional regulation<sup>16, 17</sup>, self-compassion<sup>10, 16</sup>, and sleep quality<sup>12, 14</sup> were reported as factors associated with stress, or rather, with coping with stress, being directly proportional to the intensity of stress experienced.





The work of Gorvine et al. <sup>10</sup> explored this relationship in its results. The authors stated that the higher the self-compassion scores, the lower the perceived stress scores among individuals. Therefore, even if the practice of yoga does not directly demonstrate direct results in reducing the stress levels reported by the participants, increasing the levels of self-compassion will indirectly offer tools to cope with stress due to changes in the structure of the psychological profile and personality traits.

Regarding the mechanisms possibly associated with the satisfactory results of the practice of Yoga in mental health, there is strong evidence in the literature that the practice of Yoga promotes the inhibitory tone of cortical GABAergic. Exposure to yoga practice for 12 weeks increases levels of thalamic GABA and dopamine in the ventral striatum<sup>18</sup>.

Studies based on neuroscience justify the effects of yoga practice by mentioning the bioelectrical activity of the brain, apparently, yoga increases brain activity in the regions of the amygdala and frontal cortex <sup>19</sup>. Meditation leads to changes in the anterior and dorsolateral cingulate cortex and increased alpha waves, which are relevant during conscious awareness and working <sup>memory</sup><sup>20</sup>.

Beta-type brain wave activity is present throughout the motor cortex during the execution of isotonic contractions and slow movements, typical of the practice of asanas in yoga, these waves are related to gains in academic performance and high capacity for arithmetic calculations <sup>21</sup>.

A combination of physical practices, breathing exercise, and meditation is able to stabilize the autonomic nervous system, with emphasis on parasympathetic innervation, thus being competent in reducing arousal, being able to improve stress and anxiety levels, and improve emotional resilience and spirituality <sup>14, 16</sup>. Practicing yoga appears to regulate the autonomic nervous system, reducing sympathetic activity and increasing the production of neurotransmitters such as serotonin and dopamine, which is directly associated with emotional well-being and stress reduction <sup>15</sup>.

The stress indices associated with higher education are a subject of recurrent concern in the clinical, academic and scientific communities. The short, medium and long-term repercussions lead to psychological, social and even physical debilitation. Measures to cope with academic stress through non-pharmacological mechanisms is also a change in lifestyle, and a permanent and cost-effective countermeasure is possible for this population.

Despite presenting significant results with effect sizes ranging from small to moderate, the cost-benefit of implementing yoga programs is promising. This review was guided by the question "would the practice of yoga be an effective and efficient non-



pharmacological alternative in the management of self-perceived psychological stress in university students?" and the answer to this question is "Yes".

The suggestion for future research is that future studies present a clearer outline of intervention protocols, as well as the dose and more active comparison groups can offer safe implementation subsidies to be applied in practice by Higher Education Institutions.

## FINAL CONSIDERATIONS

The practice of yoga proved to be efficient in reducing stress scores, being a superior approach to the control group, physical exercise, relaxing music and has effects similar to cognitive behavioral therapy and *mindfulness*. In view of the data collected in this review, the implementation of yoga programs is presented with a favorable cost-benefit, since it is possible to apply numerous variations and modalities of different forms of administration.

Suggestions for future rehearsals are the elaboration of more rigorous protocols, with a detailed description of the sequences of movements adopted and types of meditation applied in the practice. Another important issue for future perspectives is about the exposure dose, the studies were very varied, and it is not possible to establish a safety parameter for the therapeutic effects.



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