

BREATHING EXERCISES FOR ANXIETY MANAGEMENT: A SCOPING REVIEW OF THE MOST RECENT RCTS

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Abstract: Anxiety is a normal reaction that can interfere with one's emotions which can be the biggest problem in their life and affect physical and psychological health. Breathing exercise is one technique that is easy to use for decreasing anxiety. Objective: Determine breathing exercises that can reduce anxiety in adults. Methods: The articles were searched using PubMed, CINAHL, Scopus, and SAGE Journal databases. The inclusion criteria are articles that focus on breathing exercise for anxiety, full-text availability, articles published within 10 years (2012-2022), RCT (Randomized Controlled Trial) research, and articles in English or Indonesian. Results: 12 articles about breathing exercises related to anxiety in adults were obtained. Conclusion: Based on the articles obtained, 8 breathing exercises were found, which are diaphragmatic breathing relaxation, controlled Breathing techniques, alternate nostril breathing exercise, deep Breathing, pattern breathing, four breathing techniques, SKY breathing exercise, and Lamaze breathing technique.

Keywords: Adult, Anxiety, Breathing Exercises, Complementary Therapies, Mind-body Therapies

INTRODUCTION

Anxiety is a feeling of fear or worry that is a response to external or internal stimuli that can have behavioral, emotional, cognitive, and physical symptoms. Anxiety is different from fear, that is, the feeling of fear or being threatened by a clearly identifiable external stimulus that signals danger to the person (Videbeck, 2020). Anxiety disorder is a

common type of mental illness that consists of separation anxiety and selective mutism (occurs especially in childhood between the ages of 4 years and 18 year), specific phobias, social anxiety disorder, and generalized anxiety disorder (Penninx et al., 2021). The Global Burden of Diseases, Injuries and Risk Factors Study (GBD) 2019 shows that the two deadliest mental disorders are depressive and anxiety disorders, both of which are among the 25 leading causes throughout world in 2019 (Vos et al., 2020).

Anxiety is a normal reaction that can appear alone or due to other symptoms that interfere with a person's emotional condition where if a person's adjustment is not good it will be the biggest problem in his life and will have an impact on physical and psychological health (Putra et al., 2018). The incidence of anxiety found in adult patients ranges from 11-80% (Erawan et al., 2013). Another study found that severe anxiety occurred in early adult patients who underwent postoperative tract who had a limb fracture of 28.6% (Maisyaroh et al., 2015).

To reduce the level of anxiety, there are several ways, namely relaxation exercises inhale deep, distraction, five-finger hypnosis, and doing spiritual activities (Keliat et al., 2019). One of the easy and doable techniques to lower anxiety, namely the deep breath relaxation technique in which this technique is used by the individual to control themselves when There is physical, emotional, or stressful discomfort by which this technique can reduce anxiety, pressure on the muscles, obtaining maximum benefit from rest and sleep time and confidence in making decisions (Ariga, 2019). There are changes due to deep breath relaxation techniques, namely, lowering blood pressure, lowering the frequency of heart work, lowering muscle tension, improving body fitness, improves concentration and seeks solutions to improve the ability to deal with stressors, then does not focus on stressors and relaxes (Potter et al., 2017).

Based on the problems above, it is very important to know various kinds of breathing exercise techniques that can be done to reduce anxiety.

Research Objective

To identify various kinds of breathing exercise techniques to reduce anxiety in adult patients

METHODOLOGY

Study design

The research design used was a scoping review based on the PRISMA-ScR (Preferred Reporting Items for Systematic Review and Meta-Analysis Extension for Scoping Review) framework (Waid & Uhrich, 2020). The question on this scoping review is "What are the different types of breathing exercise techniques to lower anxiety in adult patients?".

Search methods

Searching articles using PubMed, CINAHL, Scopus, and SpringerLink databases. Synonyms of primary keyword compiled using the PICO approach were searched using Medical Subject Headings (MeSH) and Thesaurus. The search was conducted using a boolean with the following keywords: (Adult OR Grown up OR Mature) AND (Breathing exercise OR Breathing relaxation OR Breathing therapy) AND (Anxiety OR Fearfulness OR Nervous OR Worry).

Eligibility criteria

PICO framework was used as a strategy used in determining the feasibility criteria for studies with Population: adult, Intervention: breathing exercise, Comparison component is not used, because the purpose of this study is only to know types of breathing exercise techniques only, not to compare interventions with one another, and Outcomes: anxiety. In addition to using the PICO framework, there are several articles that discuss breathing exercises in anxiety, full text, published of the last 10 years (2012-2022), RCT (Randomized Controlled Trial), in English and Indonesian. Meanwhile, the exclusion criteria for this research are articles which is only available abstract or summary, not in English and Indonesian, article in the form of proceedings, thesis, thesis, editorial, book, meta-analysis review, systematic review, and protocol research.

Data collection and analysis

After searching the literature, identification was carried out using the PRISMA flowchart: (1) identification and deletion of duplication, (2) filtering of literature titles and abstracts based on predetermined inclusion criteria, (3) determine the full-text articles to be included in the study, (4) Critical Appraisal is then carried out using JBI (Joanna Briggs Institute) tools with checklists for Randomized Controlled Trials (RCTs) and Quasi

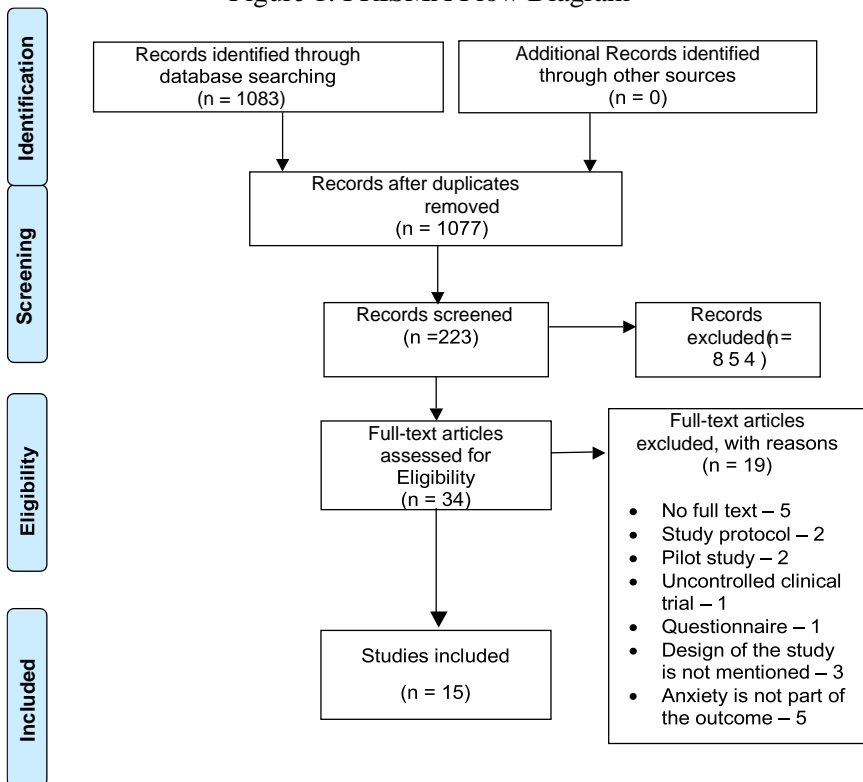
Experimental Study.

RESULTS

Selection Process

A literature search on four databases (PubMed, EBSCO CINAHL, Scopus, and SAGE Journal) yielded 1083 articles and 1077 remaining after duplicate deletion. The two-hundred twenty-three articles obtained from the selection results based on inclusion and exclusion criteria were then reviewed based on the title and abstract, resulting in 34 articles. The review is carried out until 15 complete articles are obtained that will be evaluated for quality. The number of studies selected based on the stages of the selection process is reported using the PRISMA flow diagram.

Figure 1: PRISMA Flow Diagram



After an assessment of the quality of literature, 12 articles with moderate and good quality categories were obtained, so that in this study there were 12 articles to be reviewed.

Table 1: Critical Appraisal Analysis

No.	Author, Year	JBI Critical Appraisal Checklist	Literature Quality Assessment
1.	(Chen et al., 2017)	92,3% (12/13)	Good Quality
2.	(Kamath et al., 2017)	76,9% (10/13)	Good Quality
3.	(Hayama & Inoue, 2012)	92,3% (12/13)	Good Quality
4.	(Rosenberg & Hamiel, 2021)	61,5% (8/13)	Medium Quality
5.	(Lin et al., 2019)	69,2% (9/13)	Medium Quality
6.	(Valenza et al., 2014)	84,6% (11/13)	Good Quality
7.	(Telles et al., 2017)	46,15% (6/13)	Low Quality
8.	(Baljon et al., 2020)	92,3% (12/13)	Good Quality
9.	(Liu et al., 2020)	44,4% (4/9)	Low Quality
10.	(Boaviagem et al., 2017)	76,9% (10/13)	Good Quality
11.	(Gerbarg et al., 2015)	66,7% (8/13)	Medium Quality
12.	(Seppälä et al., 2014)	84,6% (11/13)	Good Quality

Study Characteristics

Participants in the collected study had a variety of demographic characteristics, mean age, anxiety levels, and conditions (Table 2). Of the twelve articles obtained, eight studies were conducted in developed countries (Japan, Spain, Israel, Taiwan, Turkey, and the United States) and four articles in developing countries (India, China, Saudi Arabia, and Brazil). The research design on twelve articles is a Randomized Controlled Trial. The total number of samples was 791 participants with ages in the range of 19-77 years. The level of anxiety of respondents also varied starting from moderately anxious, severely anxious, and not explained. Based on the condition of the respondents, there were respondents who had comorbidities, respondents to pregnant women, respondents with PTSD, and healthy respondent.

Table 2: Characteristics of The Study

Country	Study Design	Sample (n)	Age (years)	Anxiety Levels	Respondent's Condition	Reference
China	RCT	46 (IG: 24, CG: 22)	IG: 23.8 ± 6.1, CG: 25.27 ± 7.49	NI	COPD patients	(Chen et al., 2017)
Taiwan	RCT	84 (IG: 42, CG: 42)	IG: 70.92, CG: 73.50	NI	COPD patients	(Lin et al., 2019)
Spanish	RCT	46 (IG: 23, CG: 23)	IG: 76 ± 5.5, CG: 74.43 ± 6.7	NI	COPD patients	(Valenza et al., 2014)
Japanese	RCT	23 (IG: 11, CG: 12)	IG: 53.6 ± 9.4, CG: 61.7 ± 9.8	NI	Cancer Patients	(Hayama & Inoue, 2012)
Israel	RCT	34	25.1	NI	Healthy	(Rosenberg & Hamiel, 2021)
India	RCT	30 (IG: 15, CG: 15)	19 – 24	NI	Healthy	(Kamath et al., 2017)
Saudi Arabia	RCT	225 (IG: 113, CG: 112)	25.9 ± 2.5,	NI	Primigravidae	(Baljon et al., 2022)
Turkish	RCT	70 (IG: 35, CG: 35)	IG: 23.28 ± 4.11, CG: 10:40 p.m. ± 4.61 p.m.	NI	Pregnant Women	(Cicek & Basar, 2017)
	RCT	43 (IG: 23, CG: 20)	Ni	NI	Mothers with chronic NLBP	(Atilgan & Tuncer, 2021)
	RCT	29 (IG: 16, CG: 13)	54	NI	IBD patients	(Gerbarg et al., 2015)
United States	RCT	21 (IG: 11, CG: 10)	IG: 28.09 ± 2.91, CG: 29.20 ± 6.66	Moderate and High	Military Veterans with PTSD	(Seppälä et al., 2014)
Brazil	RCT	140 (IF: 67, CG: 73)	IG: 21.16 ± 5.14, CG: 20.58 ± 5.24	Moderate and High	Pregnant Women	(Boaviagem et al., 2017)

* CG, control group; COPD, chronic obstructive pulmonary disorder; IBD, inflammatory bowel disease; IG, intervention group; NI, no information; NLBP, non-specific low back pain; PTSD, post-traumatic stress disorder; RCT, randomized controlled trial

Types of interventions

Some of the breathing exercise techniques found in the 12 articles were later grouped into 8 groups. Most breathing exercises are not combined with other therapies and used tools (See Table 3).

Table 3: Breathing Exercise Techniques

Breathing Exercise Techniques	Reference	Combination with Other Therapies	Use of tools	Details
Diaphragm	(Chen et al., 2017)	None	Monitor biofeedback (encoder)	Participants performed diaphragmatic breathing correctly during the training process and were recorded for about 5 minutes with eyes closed for the entire duration. Sessions are conducted for 8 weeks (twice per week for the first 4 weeks and once a week for the last 4 weeks).
	(Lin et al., 2019)	Walking	None	For walking groups participants were required to practice breathing-based walking interventions of about 30 minutes per day, 5 days a week, for two months.
	(Atilgan & Tuncer, 2021)	Pursed lip breathing and stabilization exercises	Stabilizer Pressure Biofeedback Unit	Breathing exercise (diaphragmatic and PLB) is performed while performing stabilization exercises. Participants focuses on the breathing cycle, its time and movement, when performing stabilization exercises.
Controlled breathing program	(Valenza et al., 2014)	None	None	Breathing is controlled with relaxation exercises, PLB, and expiratory exercises. The program is conducted with a physiotherapy in 30 minutes/session and participants are instructed to take a 3-minute break
Nostril Breathing	(Kamath et al., 2017)	Simulated public speaking test	None	One ANB cycle is performed by closing the eyes (15 min: <ul style="list-style-type: none"> • Starting by exhaling through both nostrils • Close the right nostril with the thumb of the right hand. • Inhale slowly and completely through the left nostril. • Close left nostril with the little finger and the ring finger of the right hand followed by the right nostril is opened and exhaled through it. • Inhale through the right

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				nostril followed by exhalation through the left nostril.
Deep Breathing Exercises	(Hayama & Inoue, 2012)	None	DVDs and pamphlets	Each participant took a deep breath 10 times during each step and performed in the supination position. <ul style="list-style-type: none"> • Deep breathing with hands raised • Abdominal excursions • Chest breathing Deep breathing with hands raised again.
	(Rosenberg & Hamiel, 2021)	None	Monitor biofeedback (encoder)	• Sitting in a chair Put one hand on the abdomen to pay more attention to abdominal breathing and avoid chest breathing as much as possible.
	(Baljon et al., 2022)	Reflexology, foot and back massage.	Towels, warm oils, and reflexology sticks.	BRM Technique: Breathing (5 min) <ul style="list-style-type: none"> • Deep and rhythmic breathing through the nose and exhaled slowly through the mouth during contractions. Foot Reflexology (20 min) <ul style="list-style-type: none"> • Performs direct pressure on certain areas of the legs. Massage (35 min) <ul style="list-style-type: none"> • Combines traditional Swedish and Malay massage Swedish effleurage massage is applied to the feet, and traditional Malay massage is applied to the lower and upper backs
Breath Pattern Exercises	(Boaviagem et al., 2017)	None	None	• Inhale slowly and count from 1 to 5 and exhale by counting 5 to 1. • For breathing patterns with post-expiratory pauses, take a deep breath and extend the post-expiratory pause (1 to 2 seconds). • With respect to expiratory deceleration, Take a deep breath, and push the lips forward.

				<p>This pattern is used mainly when contractions are strong.</p> <p>Coherent breathing, performed at a rate of 5 breaths per minute (bpm) with the same inhalation and exhalation using chimes tone</p> <p>Breathing resistance is performed by creating resistance to airflow with a slight contraction of the laryngeal muscles</p> <p>The movement of the breath, the imaginative movement of the breath in circuits throughout the body, which comes from the prayer practices of Russian Orthodox monks and from Qigong.</p> <p>The breath "Ha", a short activation exercise, requires a fairly strong and strong expiratory inhalation while shouting "Ha" with the movement of the arm, at a speed of 15 bpm.</p> <p>The sequence used consists of 3 rounds of 15 "Ha" breaths with a break of 15 seconds after every round.</p>
<i>Four breathing techniques</i>	(Gerbarg et al., 2015)	Qigong Movement and <i>Open Focus meditation</i>	CD recordings	
<i>SKY breathing techniques</i>	(Seppälä et al., 2014)	Discussion and stretching	BIOPAC respiration belt connected to RSP100C BIOPAC System amplifier	<p>The exercise includes four sequential respiratory components, shapes and rhythms interspersed with normal breathing while sitting with your eyes closed. For a 7-day, 21-hour intervention, participants met daily for 3 hours of group sessions.</p>
Lamaze Breathing Technique	(Cicek & Basar, 2017)	None	None	<p>First stage (normal, basic breathing)</p> <ul style="list-style-type: none"> Inhale through the nose and exhale through the mouth. The abdomen remains stationary with the chest wall moving outwards. <p>Second stage (deep chest breathing)</p> <ul style="list-style-type: none"> Inhale through the nose in 5 seconds and exhale through the mouth slowly for 5 seconds. <p>Third stage (rapid-shallow)</p>

chest breathing)

- Breathe with the upper lungs through the mouth. This breathing pattern includes cleansing breaths and rhythmic hee-hee-hoo
- Let the intensity of the contractions guide when to use light breathing.
- Speed up and lighten breathing as contractions increase.

Fourth stage (blowing-abdominal breathing)

- Breath through the mouth
- Blow, imagine like blowing out candles.

The blowing should be fast and shallow

* ANB, alternate nostrils breathing; BRM, breathing reflexology massage; PLB, pursed lip breathing

Diaphragm breathing technique

The diaphragm breathing technique focuses on the breath and slows down the breath rate by using processes such as counting the breath while developing the abdomen and taking a deep breath through the nose, stopping, followed by deflating the abdomen and exhaling slowly and completely through the mouth (Janet & GOWRI, 2017; Sundram et al., 2014). This type of deep breathing technique includes developing inhalation and exhalation patterns to lower the respiratory rate (Busch et al., 2012; Christakis et al., 2012; Ma et al., 2017; Sundram et al., 2014).

In the 8-week training conducted on COPD patients, this technique significantly lowered anxiety ($p < 0.05$) (Chen et al., 2017). Diaphragmatic breathing techniques combined with walking in COPD patients also significantly decreased anxiety in time 1, 2 and 3 ($p < 0.001$) (Lin et al., 2019). In addition, diaphragmatic breathing techniques combined with stabilization exercise also had a significant effect on

maternal anxiety with NLBP ($p < 0.05$) (Atilgan & Tuncer, 2021).

Controlled breathing exercises

Controlled breathing exercises include exercises such as active expiratory, slow and deep breathing, pursing lip breathing, relaxation therapy, specific body positions, inspiration muscle training, and diaphragmatic breathing (29). Anxiety and depression in acute exacerbation COPD patients showed neglect after controlled respiratory intervention ($p < 0.001$) (Valenza et al., 2014).

Alternate nostrils breathing (ANB)

ANB focused through the nostrils and is performed alternately, one side at a time. This technique did not have a significant impact on the anxiety affected by the simulation of public speaking ($p = 0.007$) (Kamath et al., 2017).

Deep breathing exercises

Deep breathing helps blood flow, lowers pulse and blood pressure by increasing vagal activity and reducing sympathetic reactions so that heart rate, blood pressure and breathing frequency decrease and within normal limits (Janet & GOWRI, 2017). Deep breathing exercises can reduce tension anxiety in cancer patients undergoing adjuvant chemotherapy ($p = 0.00$) (14), as well as students who will take the exam ($p < 0.05$) (15). Deep breathing exercises combined with reflexology and massage on primigravida also showed that the intervention could lower anxiety levels during and after childbirth ($p < 0.001$) (Baljon et al., 2022).

Breath pattern exercises

Breathing patterns automatically changes and spontaneously prolongs the expiratory phase of the respiratory cycle in response to stress. The use of breathing patterns can be an alternative therapy to control anxiety disorders (Brown et al., 2013). Although it has the potential to be an alternative therapy for anxiety, breathing pattern exercises have no significant effect in reducing anxiety in mothers who give birth ($p = 0.578$) (Boaviagem et al., 2017).

Four breathing techniques

Four breathing techniques are part of the mind and body intervention, the

Breath Body Meditation Workshop (BBMW). BBMW is a program of movements, voluntarily regulated breathing practices (VRBPs), and meditation that has been shown to be effective in reducing perceived stress, anxiety, depression, post-traumatic stress, inflammation, and pain (20). These four breathing techniques consist of coherent breathing, resistance breathing, movement breathing, and “Ha” breathing. Four breathing techniques combined with Qigong movements coordinated with breathing and open focus meditation lowered anxiety levels in IBD patients (Gerbarg et al., 2015). In IBD patients, there was a significant improvement in anxiety between the beginning and the 6th week ($p = 0.02$) (Gerbarg et al., 2015).

SKY breathing technique

SKY is a yogic breathing exercise that involves an advanced form of rhythmic breathing, a cycle with slow, moderate, and fast cycles (Zope & Zope, 2013). The SKY breathing technique performed on American veterans with PTSD showed that there was a reduction of anxiety symptoms 1 week after the intervention ($p < 0.001$), 1 month after the intervention ($p < 0.001$), and 1 year after the intervention ($p = 0.002$) (Seppälä et al., 2014).

Lamaze breathing technique

Lamaze breathing has been widely used in many countries as a breathing training method. Lamaze breathing is based on focused breathing, primarily involving muscle relaxation, structured breathing, and focus diversion (Podgurski, 2016). This Lamaze breathing technique had no significant effect in lowering anxiety in mothers who gave birth in the early latent ($p = 0.807$) and late latent ($p = 0.773$) phases. Meanwhile, in the final active phase, maternal anxiety decreases ($p < 0.001$) (Cicek & Basar, 2017).

DISCUSSION

This review found six types of breath exercises that can reduce anxiety levels in adults including diaphragmatic breathing techniques, controlled breathing exercises, deep breathing exercises, four techniques breathing, SKY breathing exercises, and Lamaze breathing techniques.

Meanwhile, *alternate nostrils* breathing and *breathing* pattern exercises showed no significant influence on the article under review (Boaviagem et al., 2017; Kamath et al., 2017).

Anxiety can be affected by breathing where the absorption of O₂ and the production of CO₂ and deep breathing where the use of O₂ and the formation of CO₂ after gas exchange occurs. In the respiratory system there are respiratory muscles to reduce and enlarge the chest cavity, nerves that connect the respiratory center with the respiratory muscles, in which it controls the respiratory muscles. When the work of the brain increases due to anxiety, it affects the respiratory muscles which caused breathlessness so that the absorption of oxygen from the outside and the formation of carbon dioxide in the body is not maximum (Rector et al., 2016).

Breathing exercises are very useful to reduce anxious and depressive emotions because a slow respiratory rate and a higher tidal volume increase the amplitude of respiratory sinus arrhythmia (Cheng et al., 2014). Breathing exercises also improve oxygen uptake, adjust the autonomic nervous system and help create a better emotional state through the interaction between the body and the brain (Paulus, 2013). Slow and deep breathing causes parasympathetic activation, lowers heart rate and the release of stress hormones, and thus increases the feeling of calm in the body (Braun et al., 2015).

Parasympathetic nervous system (PNS) can be stimulated by the presence of diaphragmatic movements involved in controlled breathing exercises, diaphragmatic breathing exercises, and deep breathing exercises. Prolonged expiration can stimulate the PNS (Komori, 2018). In COPD patients, they breathe using only the intercostal muscles and do not use the diaphragm (Valenza et al., 2014). Prolonging expiratory with a combination of relaxation exercises can be useful during daytime activities on the COPD, especially when anxiety appears as a possible attack of dyspnea (Valenza et al., 2014; Volpato et al., 2018) The combination with pursed lip breathing (PLB) can also improve abnormal breathing patterns due to hyperventilation, help relaxation and reduce hypocapnia so that it can reduce the frequency of breathing and shortness of breath, reduce anxiety and depression in COPD patients (Borge et al.,

2014; Valenza et al., 2014).

Diaphragmatic movements are also involved in diaphragmatic breathing and deep breathing, where diaphragm contractions, abdominal enlargement, and deepening of inhalation and exhalation, lowers the frequency of respiration and maximizes the amount of blood gas (Ma et al., 2017). Diaphragmatic breathing combined with walking can be detrimental due to the accompanying adjustments to the autonomic nervous system and decreased perception of threats from the environment (Cheng et al., 2014; Heenan & Troje, 2014; Lin et al., 2019). The combination of diaphragmatic breathing and PLB also helps to improve breath breathing patterns in the LBP patients, where they have greater inhalation volume when performing lifting tasks compared to individuals without LBP (Atilgan & Tuncer, 2021; Hagins, 2011). Irregular breathing patterns can cause and worsen anxiety (Hayama & Inoue, 2012). Controlling breathing patterns and learning how to breathe properly is important to reduce anxiety levels and help improve activity in patients with LBP (Ostwal & Wani, 2014).

Deep breathing exercises lowered tension anxiety in cancer patients undergoing adjuvant chemotherapy and anxiety tests in college students (Ariga, 2019; Hayama & Inoue, 2012; Rosenberg & Hamiel, 2021). The combination of deep breath exercises with reflexology and massage in primigravidae has also been shown to reduce the level of anxiety related to childbirth, where feelings of fear of hurting oneself or the newborn and feeling weak or crying all the time that primigravidae usually experiences during labor, is effectively reduced (Baljon et al., 2022). Mechanism of action through stimulation of the PNS, together with the release of endorphins, enkephalin, and enkephalin, cumulatively lowers the heart rate and the release of stress hormones, and thus increases the feeling of calm in the body (Baljon et al., 2020).

A parasympathetic activity can also be enhanced with Voluntarily Regulated Breathing Practices (VRBPs) such as four breathing techniques that can then reduce excessive sympathetic activity, and thus trigger an anti-inflammatory cascade that has the potential to reduce inflammation in IBD patients (Brown et al., 2013). Psychological stresses such as anxiety in IBD patients can affect the quality of life and severity of IBD symptoms so that the prevention in IBD patients not

only aims to reduce IBD symptoms but also reduces psychological pressure (Gerbarg et al., 2015). Four breathing techniques are part of mind and body interventions, *Breath Body Meditation Workshop* (BBMW), which includes the Movement program (Qigong), VRBPs (four breathing techniques), and meditation (*Open Focus Meditation*) (Gerbarg et al., 2015).

Another breathing exercise that is part of the intervention of the mind and body is SKY breathing techniques which is part of Sudarshan Kriya Yoga (SKY) and consists of yoga breathing exercises (pranayama), including slow, moderate and fast breathing, yoga postures, and meditation (Katzman et al., 2012). In normal situations, rapid breathing exercises interspersed with slow breathing pauses can provide a relaxing effect and vivid imagery (Das et al., 2002). In American veterans with PTSD, SKY showed the strongest effect on hyperarousal and re-experiencing symptoms, generalized anxiety and arousal symptoms (Seppälä et al., 2014). Yoga has been shown to normalize the activity of the sympathetic nervous system and increase parasympathetic nerve activity as indicated by heart rate variability (Gerbarg & Brown, 2005). SKY also has the perspective that in allowing emotions to change the breath (and causing physiological changes that may prove unhealthy), a person can skillfully use the breath to change his emotional state (Bloch et al., 1991; Das et al., 2002).

Focused breathing techniques such as Lamaze's breathing technique involves muscle relaxation, structured breathing, and focus diversion significantly lowered anxiety in mothers who gave birth during late active phases (Cicek & Basar, 2017; Podgurski, 2016). Conscious breathing (especially slow breathing) reduces heart rate, anxiety, and pain perception because when breathing is in focus, other sensations (such as labor pain) go unnoticed and felt (Lothian & De Vries, 2012).

In contrast to Lamaze's bathing technique, breathing pattern exercises had no significant effect in lowering anxiety in mothers who gave birth in the article reviewed in this study (Boaviagem et al., 2017). This is because the use of breathing techniques alone may not be sufficient to reduce labor pain, whereas the pain increases, there is also an increase in the level of anxiety. Furthermore, high levels of anxiety can cause pelvic muscle spasms and increase pain (Boaviagem et al., 2017). In addition,

ANB also

did not have a significant impact on the anxiety affected by the simulation of public speaking in the article under review (Kamath et al., 2017). This is because the neurophysiological effects of ANB require longer periods of exercise (Streeter et al., 2020). This is supported by another study that found ANB performed for 1 month led to significant improvements in breathing parameters in young adults (Jahan et al., 2020).

This study has some limitations. Since most of the research is conducted in developed countries, it is necessary to be wise and careful when extrapolating findings to developing countries. Furthermore, the authors do not use sources from gray literature and rely only on research results published in the database. However, it is hoped that this literature review can be applied to someone who has anxiety. Nurses as healthcare can perform simulations and provide education so that someone with anxiety can routinely apply this breathing exercise so that anxiety levels are reduced. In addition, further research can conduct research on the types of breathing exercises that support a disease and exercises that deal with anxiety in various levels of anxiety.

CONCLUSION

The selection was made on 1083 articles obtained based on keywords. After selection of articles, 12 articles met the inclusion and eligibility criteria. Thirteen selected articles describe eight types of breathing exercises to reduce anxiety in adults with six types of exercises that have a significant effect in lowering anxiety, namely techniques diaphragmatic breathing, controlled breathing exercises, deep breathing exercises, four breathing techniques, SKY breathing exercises, and Lamaze breathing techniques. While the other two types of exercises, alternate nostrils breathing and breathing pattern exercises, did not show a significant influence on the article under review.

Informed Consent Statement

Data is accessible and there are no consent issues

Conflict of Interest

The author(s) have no conflict of interest to declare

Ethics Statement

Data is accessible and there are no ethics issues

Author Contributions

Indra Kusumah: designing the study/research; analysis and interpretation of data.

Efri Widianti: designing the study/research; final review with critical and intellectual participation in the manuscript.

Khaira Ashfiya Salafi: analysis and interpretation of data.

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Data Availability Statement

The contents underlying the research text are included in the manuscript.

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