



## Research article

# The physical and psychological effects of dance therapy on middle-aged and older adult with arterial hypertension: A systematic review

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## ABSTRACT

**Objective:** To systematically review the intervention effect of dance therapy on the physical and psychological health level of middle-aged and older adult with arterial hypertension.

**Methods:** The databases including the Cochrane Library, PubMed, Web of Science, EBSCO, CNKI, VIP, WANFANG DATA, and Bailianyun Library, which were searched for the randomized controlled trials for identifying the effect of dance intervention on the blood pressure. The literature published from the establishment of the database to May 10, 2023, was collected for analysis. The quality of the literature was evaluated by the Cochrane bias risk assessment tool.

**Results:** The blood pressure in the dance intervention group were significantly improved than those of patients in the control group. However, among the mediating variables that influence the effects of dance intervention, its intensity and frequency based on the improvement of aerobic capacity were found high and low respectively, while the research on dance intervention aimed at muscle strength, endurance, and flexibility remains lacking. The movement selection and arrangement of dance therapy could integrate the physical activities with local traditional cultural characteristics.

**Conclusions:** It is worth noting that in the selection and arrangement of movements, dance therapy can skillfully integrate physical activities with local cultural characteristics. This unique combination not only enriches the content of dance therapy but also deepens people's understanding and recognition of traditional culture. Through this comprehensive dance intervention approach, we hope to comprehensively improve participants' physical and mental health, and promote the inheritance and development of culture.

## 1. Introduction

What is hypertension (HTN)? It defined as systolic blood pressure (SBP) at least 130 mmHg or diastolic blood pressure (DBP) at least 80 mmHg [1]. HTN has been the commonest chronic and noncommunicable disease with the heaviest disease burden in the world

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[2], and it was affecting half of US adults [3]. HTN was responsible for 8.5 million death from stroke, heart disease, and other vascular disease worldwide [4]. However, if HTN is effectively controlled, the death rate caused by the cardiovascular disease (CVD) can be reduced [5].

Risk factors for HTN include the unhealthy dietary habits, unhealthy physical conditions, age, lack of physical activity, and genetic factors, but maintain health lifestyle can effectively reduce blood pressure 3.5 mmHg [5]. For example, aerobic training with moderate intensity is the elemental mode recommended in the management of HTN [6]. Previous research found a significant mean decreases of 6.0–12.3 mmHg in systolic blood pressure and 3.4–6.1 mmHg in diastolic blood pressure after an aerobic training in patients with hypertension [7,8].

Dance as a kind of aerobic exercise that involve major muscle groups, improve oxygen consumption by body, and when participants dancing in an exquisite melody with fast and slow rhythm, which could improve their strength, coordination, balance, flexibility, and cardiovascular endurance, and increase participants' adherence, social interaction and self-efficacy in the meantime [9]. Therefore, dance has been applied as a exercise intervention in the research for patients with hypertension. After 12 weeks square dance significantly decreased the SBP and DPB [10]. Researchers [11] are focusing increasingly on dancing's potential benefits for middle-aged and elderly people with HTN, while studies have confirmed the positive effect of dancing. However, the differences in the research paradigms, such as RCT, case-control study or cross-sectional study, or in the dance intervention programs, such as the dance's forms, movements, intensities, and frequencies, also lead to inconsistency between these research results. Therefore, to comprehensively assess the validity of dance therapy for patients with arterial HTN around the world, this research used the Cochrane Risk of Bias assessment tool for evaluating the quality of studies designed as the RCT that is the gold standard for determining the effectiveness of a treatment [12] and score each of them, which will provide reference data for further clinical studies.

## 2. Methods

This research follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and registers its detailed protocols before data extraction commences through PROSPERO platform (CRD42022351251) [13].

### 2.1. Searching strategy

The searching started on May 6, 2023 to May 10, 2023. The referred English databases included the Cochrane, PubMed, Web of Science, and EBSCO, and the referred Chinese databases consisted of the CNKI, VIP, WANFANG DATA, and BAILIANYUN Library. The retrieval time dated from the establishment of each database to May 10, 2023. The manual searches of the reference list of included studies in this systematic review worked as a complementary search.

This research used Medical Subject Heading (MeSH) and their respective synonyms to explore the relevant articles in the referred database [14]. For example, the terms and the Boolean operators used in the PubMed were specified below: (Hypertension OR Blood Pressure OR Blood Pressures OR High Blood Pressure OR High Blood Pressures) AND (Dancing OR Dance OR Ballet OR Square Dance OR Hip-Hop Dance OR Hip-Hop OR Hip Hop Dance OR Jazz Dance OR Jazz OR Tap Dance OR Modern Dance OR Salsa Dancing OR Salsa OR Line Dancing OR Dance Therapy OR Dance Therapies).

### 2.2. Inclusion and exclusion criteria

Inclusion criteria: Firstly, HTN patients over 45 years with systolic blood pressure (SBP)  $\geq 140$  mmHg and/or diastolic blood pressure (DBP)  $\geq 90$  mmHg were analyzed; Secondly, an randomized controlled trial (RCT) was used for the study; Thirdly, RCTs should compare at least one group with dance with a control group without dance intervention, or contain co-intervention linked to training (e.g. routine intervention) were only included if such intervention was applied to both groups (test and control); Finally, outcome indicators or partial outcome indicators were the physiological, biochemical or psychological statuses of HTN patients.

Exclusion criteria: Firstly, the qualitative research, case studies, review articles, conference papers, master/doctoral papers; And the description of experimental data is unclear or incomplete, and the original data remains unavailable even after contacting the author [14].

### 2.3. Data extraction and coding

The retrieved Chinese and English literature were imported into the E-Study and Endnote softwares to remove duplicates, then the titles and abstracts of these literature were read one by one to screen out those met the inclusion criteria. Finally, two researchers (\*.\* and \*.\*.) used the independent double-blind method to extract and input the literature information into the analysis, including the titles, authors, countries, publication years, study objects, intervention contents, intervention programs (times, frequencies, and cycles), outcome indicators, research conclusions, testing methods, equipment, and else [14]. If there were any disagreement between the information from these two independent researchers, the opinion of the third one (\*.\*) would be involved.

### 2.4. Assessment of risk of bias

Using the Cochrane Risk of Bias assessment tool [14] to evaluate the quality of included studies, which was recommended by the evidence-based guidelines for medical research. This evaluation contained seven items from six domains, which were the selective bias

(random sequence generation and distribution of the hidden), the implementation of biases (blind) of researchers and subjects, measurement bias (blind) over the assessed outcomes, follow-up bias (result data incomplete), reporting bias (selective reporting results) and other biases (other sources of bias). Among them, the low risk of bias is represented by "+", and the score is 1; The high risk of bias is denoted by "-", and the doubts of it are denoted by "?", neither of them gets a score. Five or more items were considered as the low risk of bias, three to four items as the moderate risk of bias, and less than three items as the high risk of bias, respectively. In other words, the higher the score, the lower the bias.

### 2.5. Data analysis

Apply PICO rule to analyze the studies by the symptom details of patients/population (P), interventions (I), comparisons (C), and outcomes (O). PICO stands for four different potential components, which give the researcher the specific who, what, when, where and how, of an evidence-based health question used in review research [14]. Then use the Cochrane Risk of Bias assessment tool to evaluate the quality of studies and score each of them. The parameters indicated the outcomes of dance intervention, including blood pressure (BP), blood lipid (BL), and quality of life, and mediated the results of dance intervention, including the intensity, frequency, type, and choreography of dance set for the test group, would be discussed subsequently.

## 3. Results

### 3.1. Study selection and characteristics

A total of 1405 related articles were retrieved from the database. After following the searching and screening procedure, 9 articles were screened out, consisting of seven in English and two in Chinese. All the selected literature were RCTs with a total of 961 subjects, and the characteristics of the included studies, such as the details of intervention plan and outcome indicators, can be found Table 1. In the PRISMA flowchart, the literature screening process is explained and results are presented (Fig. 1) [13]. As exhibited in Table 2, all of the included studies would be analyzed on the basis of the details of patient (P), intervention (I), comparison (C), and outcome (O) according to the PICO rule.

### 3.2. Quality evaluation of included literature

As listed in Table 3, there were totally nine studies included in this research. Among them, five ones scored 7, two ones scored 6, while the remaining two scored 5 and 4 respectively. It was indicated that all of the included studies reached a high level of research quality.

**Table 1**  
Relevant characteristics of the included studies.

Reference	Country	N (T/C)	Age (T/C)	Intervention		Frequency	Outcome indicators
				T	C		
(Bai, Lin, Wu, & Zheng, 2019)	China	41/44	62.0 ± 7.7/ 65.9 ± 6.0	SD and RI	RI	Each time 60min, 3 times a week, for a total of 12 weeks.	BP, TC, TG, LDL-C, HDL-C
(Bai, Lin, Wu, & Zheng, 2020)	China	41/44	62.0 ± 7.7/ 65.9 ± 6.0	SD and RI	RI	Each time 60min, 3 times a week, for a total of 12 weeks.	BP, PSQI
(Maruf, Akinpelu, & Salako, 2013)	Nigeria	30/33	50.38 ± 8.39/ 52.32 ± 8.06	AD and DT	DT	Each time 45min, 3 times a week, for a total of 12 weeks	BP, dosage
(Maruf, Akinpelu, Salako, & Akinyemi, 2016)	Nigeria	60/60	50.80 ± 8.31/ 54.75 ± 8.56	AD and DT	DT	Each time 45min, 3 times a week, for a total of 12 weeks	BP, dosage
(Kaholokula et al., 2017)	USA	27/28	55 ± 10/55 ± 12	Hula dance	None	Each time 60min, twice a week, for a total of 12 weeks	BP, QoL, PF,
(Maruf, Akinpelu, & Salako, 2014)	Nigeria	60/60	50.80 ± 8.31/ 54.75 ± 8.56	AD and DT	DT	Each time 45min, 3 times a week, for a total of 12 weeks	LDL-C, HDL-C, TC
(Kaholokula et al., 2021)	USA	131/ 132	58.1 ± 13.7/ 57.9 ± 12.6	Hula dance	HE	60min each time, twice a week, for 12-week; 60min each time, once a month, for 12-week.	BP, FRS-CVD
(Maruf, Akinpelu, & Salako, 2013)	Nigeria	60/60	50.80 ± 8.31/ 54.75 ± 8.56	AD and DT	DT	Each time 45min, 3 times a week, for a total of 12 weeks	QoL, EC
(Aweto, Owoeye, Akinbo, & Onabajo, 2012)	Nigeria	25/25	44.1 ± 12.7/ 46.4 ± 11.6	DMT	HE	Each time 50min, twice a week, for a total of 4 weeks	BP, VO2max, HR,

\*:T is the intervention group, C is the control group; SD for Square dance; RI for Routine intervention, and it includes health education and follow-up; AD for Aerobic dance; DT for drug therapy; HE for Health education.

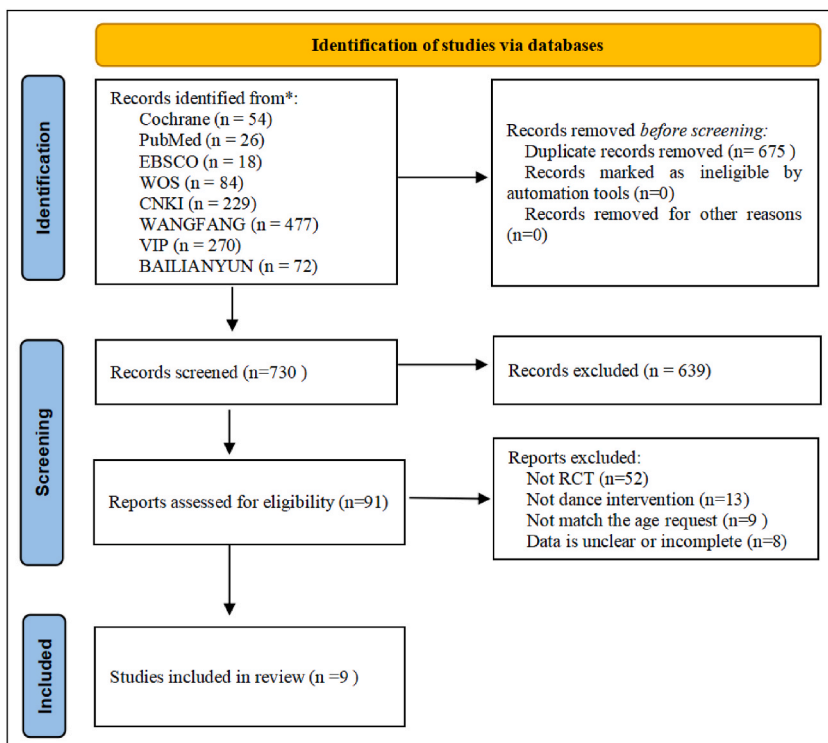


Fig. 1. PRISMA flow chart for the literature search and screening.

Table 2

PICO analysis of the included studies.

P	I	C	O	
Middle aged and elderly patients with HTN	Hula dance(Kaholokula et al., 2017)	Traditional Hawaiian cultural dance, as a form of physical activity, had a MET of 5.7 for moderate-intensity and 7.6 for vigorous intensity.	None or HE	Increase physical activity levels; Improve patients' blood pressure.
	Square dance(Bai, Lin, Wu, & Zheng, 2019)	A collective dance activity with multiple contents and styles, for the main purpose of strengthening the physical healths and pleasing the bodies and minds.	RI	Improve patients' blood pressure; Improve the body shape of patients; Lower the LDL-C levels of patients; Improve the sleep quality of patients;
	DMT(Aweto, Owoeye, Akinbo, & Onabajo, 2012)	A form of psychotherapy that involves movement and dance for curing the emotional, cognitive, social, behavioral, and physical conditions.	HE	Improve patients' blood pressure; Improve the patient's heart rate level; Increase the patient's maximal oxygen uptake
	Aerobic dance(Maruf, Akinpelu, & Salako, 2013)(Maruf, Akinpelu, & Salako, 2014)(Maruf, Akinpelu, & Salako, 2013)	It is a type of aerobic exercise that dances rhythmically with music and is an organic combination of dance and aerobics.	DT	Significantly improved patients' blood pressure level; Reduce the amount of medication used by patients; The levels of LDL-C and TG were both decreased; Improve the quality of life of patients; Improved their exercise tolerance.

\*: HE for Health education; RI for Routine intervention, which includes health education and follow-up; DT for drug therapy.

#### 4. Discussion

##### 4.1. Effect of dance therapy on blood pressure

The pressure generated by blood flow on the inner wall of blood vessels is BP. HTN is defined as the SBP/DBP  $\geq 140$  mmHg/90 mmHg without the use of anti-hypertensive drugs, which can be divided into three grades according to its increased level [15]. Among the nine included studies, seven ones used BP as the primary outcome measure, and two ones used BP as a monitoring index for HTN patients during the intervention. Although different forms of dances (e.g. square dance, aerobic dance, hula dance, and DMT) are used as single intervention or as a co-intervention linked to other forms (e.g. drug therapy, conventional treatment, or health education),

**Table 3**  
Evaluation of the quality of the included studies.

Reference	Bias Domain							Score
	①	②	③	④	⑤	⑥	⑦	
(Bai, Lin, Wu, & Zheng, 2019)	+	?	+	+	+	+	+	6
(Bai, Lin, Wu, & Zheng, 2020)	+	?	+	+	+	+	+	6
(Maruf, Akinpelu, & Salako, 2013)	+	+	+	+	+	+	+	7
(Maruf, Akinpelu, Salako, & Akinyemi, 2016)	+	+	+	+	+	+	+	7
(Kaholokula et al., 2017)	?	?	+	+	+	+	+	5
(Maruf, Akinpelu, & Salako, 2014)	+	+	+	+	+	+	+	7
(Kaholokula et al., 2021)	+	+	+	+	+	+	+	7
(Maruf, Akinpelu, & Salako, 2013)	+	+	+	+	+	+	+	7
(Aweto, Owwoeye, Akinbo, & Onabajo, 2012)	?	?	+	+	-	+	+	4

\*: ① Bias arising from the randomization process; ② Bias due to deviations from intended interventions; ③ Blinding the investigator and the subject; ④ Blinding the outcome-evaluator; ⑤ Bias due to missing outcome data; ⑥ Bias in selection of the reported result; ⑦ Other bias. The symbol “+” means low bias and score one. “-” and “?” means having high bias and some concerns, respectively, and neither of them gets a score.

and the intervention period varies from 4 weeks to 24 weeks, but all of them can effectively improve the BP levels of middle-aged and elderly people with HTN. Moreover, hula as a single intervention can significantly improve all the SBP, PF, and QoL of middle-aged and elderly people with HTN, and predict their 10-year CVD risks [16,17]. In addition, the aerobic dance combined with drug therapy exerts a more significant improvement effect on the HTN patient's BP levels among middle-aged and elderly people than those only using drug therapy [18], as the integrated way can effectively reduce their drug consumptions and keep their BP stable during the intervention [19]. Square dance has been popular among the public because it is a group dance form with a light rhythm and simple movements. After 12 weeks of single intervention by square dance, the BP levels of middle-aged and elderly people with HTN can be effectively improved as well [20,21]. Even with only 4 weeks of dance movement therapy, it can still achieve the same effects as in the previous study [22].

According to Kenny and his fellow [23], the reason dance improves blood pressure levels lies in enhancing the excitability and coordination of the sympathetic and parasympathetic nerves through exercise. Among them, the role of the parasympathetic nerve is to slow down heart rate and lower blood pressure. During and after moderate exercise, the parasympathetic nerves are continuously mobilized. So after long-term exercise, not only does a person's blood pressure and heart rate not excessively increase, but it can also improve the coordination between the sympathetic and parasympathetic nerves, making the blood pressure regulation system more sensitive and coordinated, which is conducive to improving the stability of blood pressure.

## 4.2. Mediating variables influencing the effect of dance therapy

### 4.2.1. Intensity and frequency of dance therapy

The frequency of dance intervention in the nine studies included in this study was 3 times per week, ranging from 45 to 60 min each time. Exercise prescription of HTN points out that aerobic exercise should be accumulated or under continuous training for 30min or above every day, and if it was divided, then exercise should be conducted for no less than 10min each time, and 5–7 times a week [24]. If the exercise goal is only to improve the aerobic capacity of HTN patients, the time setting of the existing dance intervention program has actually exceeded the recommendation of exercise prescription for hypertension, but its frequency setting remains far from meeting the frequency requirement of exercise prescription for hypertension. The frequency and time of the follow-up dance intervention program should both meet the basic requirements of exercise prescription for hypertension as far as possible. If the basic requirements cannot be met at the beginning of the practice, then the progressive requirements of the dance intervention program can be gradually improved and clarified at different stages, including the weekly frequency, the duration, repetition time of each practice, as well as the arrangements of each link and content of each practice.

For example, in the Ola Hou project, the hula dance intervention program was implemented in phases for 6 months: In the first 3 months, the duration of continuous dancing in each intervention class increased from 5 to 10min in the 1st week then to 40min in the 12th week; For the remaining three months, it offered hula classes only once a month for 60 min, including practicing the hula dance of the first phase, learning some new hula dance and providing a 45-min educational session to teach self-regulation strategies. The pilot trial showed that a phased intervention program was beneficial to the long-term maintenance of SBP improvement on HTN patients [25]. Among the 9 studies included in this research, four ones mentioned that the intensity of aerobic dance intervention was 50–70 % of the reserve heart rate [18,19,26,27]; Two ones controlled the intervention intensity of square dancing at medium, that was,  $HR = \text{moderate-intensity exercise} = (HR_{\max} - HR_{\text{rest}}) * (60\% - 80\%) + HR_{\text{rest}}$  [20,21]; One study declared that the intensity of the dance intervention was monitored through four indicators, which were reached the 40–85 % of maximal oxygen consumption ( $VO_{\max}$ ) or 50–70 % of maximum predicted heart rate (MPHR), the intensity of training achieved at  $(40 + [2 * \text{Max MET}])\%$ , or the rating of perceived exertion (RPE) reached the grade 12–16 of Borg scale, or target  $HR = (\text{reserve HR} * \text{training intensity}\%) + HR_{\text{rest}}$  [16]. However, it was suggested that the intensity of exercise prescription aimed at improving the aerobic capacity of patients with hypertension should be moderate, that was, 40%–59 % of the reserve oxygen uptake or reserve HR, or 12–13 points for RPE using the 6–20 scoring method [24]. As a result, the present intensity of dance intervention for HTN is excessively high, and the training intensity should be appropriately adjusted to reduce it.

In addition, the dance intervention programs for HTN patients should also consider how to improve the muscle strength, endurance and flexibility by combining different dance movements. The hypertension exercise prescription suggests that the resistance exercise and flexibility should be carried out 2–3 times a week. Resistance exercise should include at least 8–10 different movements in each exercise, 8–10 times in each group of muscle strength with 2–4 groups of repetitions, and 12–20 times in each group of muscle endurance with 2 or fewer groups of repetitions, while the intensities of both should reach 60%–70 % 1RM. After the adaptive training, the intensity of resistance training can be gradually increased to 80 % 1RM. The flexibility exercise should adopt the static stretching, and each stretching action should be repeated 2–3 times for 10–30 s each time. The range of movement is stretching until feeling nervous or slightly uncomfortable [24].

#### 4.2.2. Dancing type and choreography

Dance as one of the art categories, due to the influences of regional and ethnic factors, has produced a variety of different types, including the traditional dances and popular dances of various ethnic groups and regions. The dance forms and categories involved in this study consisted of the hula dance [16], aerobic dance [18], square dance [20], and DMT [22], all of which could effectively improve the BP levels of middle-aged and elderly people with HTN. In Native Hawaiians and Pacific Islanders, hula dancing can improve not only physical activity, but also other factors that are imperative for hypertension management [16]. Additionally, it supported the investigation of physical activity in other cultural contexts. The research can be culturally meaningful both for promoting health promotion interventions and incorporating and maintaining regular physical activity.

However, a meta-analysis indicated that the effects of dance intervention on HTN patients presented regional differences, the dance intervention reduced the SPB of African people with HTN, and this effect was better than those in Europe and the United States [11]. Compared to the Hula dance study, it was speculated that the regional differences would be attributed to the dance type of intervention applied in those studies. Therefore, this study believes that the dance intervention for patients with HTN should weaken the characteristics of diverse dance types and emphasize the function of each movement, to extract movements capable to effectively improve physical function from dances of various ethnic groups and regions in China. For example, according to the theory of traditional Chinese medicine, the health-preserving dance “Swan Goose” extracts the movement elements of Chinese folk dance and is arranged together with the melody of folk music. Through a series of movements like “Yao Jian Zhuan Bi” and “Xiao Sui Bu”, which means “shoulder shaking with arm turning” and “small steps” respectively. The whole piece is then coordinated with the adjustment of breathing, to achieve the purpose of repairing and strengthening the function of organs inside the human body, supplementing the “Qi and blood”, and spurring the vigor [28]. In addition, the Chinese classical dance and TaiChi Quan also share numerous similarities in cultural origins and movement characteristics. Both of them emphasize the “combination of virtuality and reality, integration of hardness and softness, coordination of shape and spirit, circle” in movements, and pursue the artistic expression of “unity of nature and human” in cultural aesthetics [29]. The research quantity of TaiChi Quan influencing HTN prevention and treatment intervention is more than that of dance, therefore, the follow-up research could arrange a dance piece to intervene in the physical and psychological healths of middle-aged and elderly people with HTN, which draws lessons from the way of TaiChi Quan’s creating different genres by extracting the action elements from Chinese classical dances.

It can be said that dance is a form of physical movement suitable for all ages, which owns strong rhythms and graceful movements. As for the substantial population with HTN among the middle-aged and elderly, dance intervention is beneficial to improve their physical healths [20,22]. Although the prevalence of HTN increases significantly with ages, attention should also be paid to the prevalence rates of HTN in young people and children. According to the Chinese national survey from 2012 to 2015, HTN prevalence rates in young people aged 18–24, 25–34, and 35–44 were 4.0 %, 6.1 %, and 15.0 %, respectively, while the prevalence rate of HTN in children was 4%–5%. Without effective intervention, about 40 % of hypertensive children still suffered from HTN in their adulthood [30]. Nowadays, the occurrence of HTN has tended to be younger, thus the research on young people and children with HTN also deserves attention. Compared with other exercise interventions like running, walking, TaiChi Quan, the dance intervention may be more suitable for young people and children with hypertension because of its strong rhythms and graceful movements. It may not only improve the relative indexes levels of HTN in youth and children but also enhance their interests in exercise with its artistic charms, to cultivate good habits of exercise behaviors.

#### 4.2.3. Limitation

In interpreting the findings in this study, certain limitations need to be considered. Although this study strictly followed the established standards of systematic review in the process of literature screening, striving to ensure the rigor and fairness of the screening, the regional characteristics brought by the researchers themselves limited our horizon to a certain extent, leading us to exclude non-English and Chinese research literature. Additionally, this study only focused on eight specific databases for literature collection, which may have caused us to miss important studies that meet the screening criteria but are not included in these databases, thus constituting another limitation of this study.

It is worth noting that among the many studies included in this systematic review, four studies [20–22,25] were found to have “deviations arising from deviations from the predetermined interventions”. This discovery undoubtedly casts a shadow on the reliability of these studies. At the same time, two studies [22,25] also exposed potential biases in the process of randomization, which undoubtedly further intensifies our doubts about the authenticity of these research results. Furthermore, there is also a study that may have a significant risk of bias due to the lack of some key data.

In summary, these potential problems and limitations may have a significant impact on the final evaluation of dance intervention effects, so we need to be highly cautious and vigilant when interpreting and applying these research results.

## 5. Conclusions

To sum up, dance has been a popular art form of various types, strong rhythms, and elegant movements. As a kind of aerobic exercise, it can be used in the exercise intervention for middle-aged and older adult with arterial hypertension, which can improve their level of BP, and present certain significance for clinical practices. At present, the dance's forms, movements, intensities, and frequencies are different in the existing intervention programs, which may affect the systematic evaluation of their intervention effects. In-depth research on dance exercise prescription for patients with HTN is needed in the future.

### CRedit authorship contribution statement

**Xiaoyu Peng:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Xiaoao Xu:** Writing – original draft, Methodology, Conceptualization. **Pei Hu:** Data curation. **Xiaorui Zhu:** Writing – review & editing. **Lele Wang:** Writing – review & editing, Supervision, Data curation.

### Bulletpoints

1. Dance therapy can significantly improve the blood pressure of middle-aged and older adult with arterial hypertension, especially.
2. The movement selection and arrangement of dance therapy should integrate the physical activities with local traditional cultural characteristics.
3. The effects of dance intervention is mainly focusing on the improvement of aerobic capacity currently, and practice for improving muscle strength, endurance, and flexibility remains lacking.
4. The dance's type, movements, intensities, and frequencies are different in the existing intervention programs, which may affect the effects.

### Data availability statement

Data availability is not applicable to this article as no new data were created or analyzed in this study.

### Ethics approval and consent to participate

Not Applicable.

### Declaration of originality

We hereby declare that this paper was originated entirely by ourselves. Information derived from the published and unpublished work of others has been acknowledged in the text and a list of references is given in the references.

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### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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