nutrients

Systematic Review

Effects of Different Exercises Combined with Different Dietary Interventions on Body Composition: A Systematic Review and Network Meta-Analysis

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Abstract: Background: Exercise and dietary interventions are essential for maintaining weight and reducing fat accumulation. With the growing popularity of various dietary strategies, evidence suggests that combining exercise with dietary interventions offers greater benefits than either approach alone. Consequently, this combined strategy has become a preferred method for many individuals aiming to maintain health. Calorie restriction, 5/2 intermittent fasting, time-restricted feeding, and the ketogenic diet are among the most popular dietary interventions today. Aerobic exercise, resistance training, and mixed exercise are the most widely practiced forms of physical activity. Exploring the best combinations of these approaches to determine which yields the most effective results is both meaningful and valuable. Despite this trend, a comparative analysis of the effects of different exercise and diet combinations is lacking. This study uses network meta-analysis to evaluate the impact of various combined interventions on body composition and to compare their efficacy. Methods: We systematically reviewed literature from database inception through May 2024, searching PubMed, Web of Science, Embase, and the Cochrane Library. The study was registered in PROSPERO under the title: "Effects of Exercise Combined with Different Dietary Interventions on Body Composition: A Systematic Review and Network Meta-Analysis" (identifier: CRD42024542184). Studies were meticulously selected based on specific inclusion and exclusion criteria (The included studies must be randomized controlled trials involving healthy adults aged 18 to 65 years. Articles were rigorously screened according to the specified inclusion and exclusion criteria.), and their risk of bias was assessed using the Cochrane risk of bias tool. Data were aggregated and analyzed using network meta-analysis, with intervention efficacy ranked by Surface Under the Cumulative Ranking (SUCRA) curves. Results: The network meta-analysis included 78 randomized controlled trials with 5219 participants, comparing the effects of four combined interventions: exercise with calorie restriction (CR+EX), exercise with time-restricted eating (TRF+EX), exercise with 5/2 intermittent fasting (5/2F+EX), and exercise with a ketogenic diet (KD+EX) on body composition. Intervention efficacy ranking was as follows: (1) Weight Reduction: CR+EX > KD+EX > TRF+EX > 5/2F+EX (Relative to CR+EX, the effect sizes of 5/2F+EX, TRF+EX and KD+EX are 2.94 (−3.64, 9.52); 2.37 (−0.40, 5.15); 1.80 (−1.75, 5.34)). (2) BMI: CR+EX > KD+EX > 5/2F+EX > TRF+EX (Relative to CR+EX, the effect sizes of 5/2F+EX, TRF+EX and KD+EX are 1.95 (−0.49, 4.39); 2.20 (1.08, 3.32); 1.23 (−0.26, 2.71)). (3) Body Fat Percentage: CR+EX > 5/2F+EX > TRF+EX > KD+EX (Relative to CR+EX, the effect sizes of 5/2F+EX, TRF+EX and KD+EX are 2.66 (−1.56, 6.89); 2.84 (0.56, 5.13); 3.14 (0.52, 5.75).). (4) Lean Body Mass in Male: CR+EX > TRF+EX > KD+EX (Relative to CR+EX, the effect sizes of TRF+EX and KD+EX are −1.60 (−6.98, 3.78); −2.76 (−7.93, 2.40)). (5) Lean Body Mass in Female: TRF+EX > CR+EX > 5/2F+EX > KD+EX (Relative to TRF+EX, the effect sizes of CR+EX, 5/2F+EX and KD+EX are −0.52 (−2.58, 1.55); −1.83 (−4.71, 1.04); −2.46 (−5.69,0.76).). Conclusion: Calorie restriction combined with exercise emerged as the most effective strategy for reducing weight and fat

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percentage while maintaining lean body mass. For women, combining exercise with time-restricted eating proved optimal for preserving muscle mass. While combining exercise with a ketogenic diet effectively reduces weight, it is comparatively less effective at decreasing fat percentage and preserving lean body mass. Hence, the ketogenic diet combined with exercise is considered suboptimal.

Keywords: aerobic exercise; resistance exercise; caloric restriction; intermittent fasting; ketogenic diet; weight; BMI; body fat percentage; lean body mass

1. Introduction

With societal advancements and improvements in living standards, certain lifestyle habits that predispose individuals to various chronic diseases have become prevalent. Prolonged sedentary behavior, habitual sleep deprivation, and excessive eating contribute to metabolic disorders, which can lead to obesity or other chronic conditions. Regular physical activity is a well-established method to mitigate these health issues. The myriad benefits of exercise, including muscle mass maintenance, fat reduction, and enhanced metabolic function, are widely recognized. Historically, exercise has been the predominant strategy for weight management and health maintenance. However, in recent years, dietary interventions have gained prominence, offering alternative or complementary approaches to weight management. Notably, the most common dietary strategies include calorie restriction, 5/2 intermittent fasting, time-restricted eating, and the ketogenic diet. Extensive research supports the efficacy of these methods in both animal and human studies, demonstrating significant weight loss and metabolic advantages [1–3]. Recent studies have demonstrated that three dietary intervention strategies effectively lower both diastolic and systolic blood pressure [4–8], enhance mitochondrial function [9–11], reduce oxidative stress [4,5,12,13], improve insulin sensitivity [14–17], and foster beneficial modifications in the gut microbiome [18–21]. Specifically, calorie restriction, with a reduction in energy intake of approximately 15–30%, has been substantiated to decrease body weight, diminish body fat content, prolong lifespan, and lessen the incidence of age-related diseases, including cancer [22–24]. Furthermore, moderate calorie restriction (11.9 $\pm$ 0.7%) has been shown to significantly enhance quality of life, metabolic health, liver function, skeletal muscle mass, and immune capacity within a two-year period [25–29]. Unlike calorie restriction, intermittent fasting offers flexibility in food selection, integrating seamlessly with existing dietary regimes and presenting a viable, low-maintenance approach to health improvement [30]. Short-term results indicate that 5/2 intermittent fasting and time-restricted eating can achieve a weight reduction of 3–8% [31]. Intermittent fasting shows more pronounced effects in obese and overweight individuals, with an average weekly weight loss of approximately 0.2–0.5 kg [32], whereas individuals of normal weight may experience a reduction of about 0.2 kg per week [33]. Notably, about 75% of weight loss attributable to calorie restriction or intermittent fasting comprises fat mass, with the remaining 25% being lean body mass [34–37]. The ketogenic diet induces a metabolic state known as ketosis, where ketone bodies, rather than glucose, serve as the primary energy substrate, lowering blood glucose levels and facilitating the use of ketones for energy [38,39]. Additionally, the ketogenic diet has been associated with enhanced immune function [40,41], improved neurological health, and potential efficacy in treating epilepsy and inhibiting tumor growth [42]. Despite these benefits, some dietary interventions may lead to muscle mass reduction, consequently decreasing the basal metabolic rate [7,32], a factor that could be intertwined with overall weight loss [43–45]. The reduction in skeletal muscle can lead to various issues, including a lowered basal metabolic rate, impaired enhancement of exercise capacity, and reduced caloric burn [46–48]. Research has demonstrated that both aerobic and resistance training are highly effective at preserving lean body mass during weight loss efforts [49]. Subsequently, an increasing number of individuals have explored the combination of exercise and dietary interventions to mitigate the drawbacks of single interventions and achieve synergistic benefits. Recent trials have demonstrated the feasibility of combining exercise with dietary interventions; participants have been able to perform moderate to high-intensity endurance or resistance training during fasting periods of 12 to 36 h without adverse effects after adapting to the fasting regimen [44,45,50–52]. Research has shown that exercise surpasses calorie restriction in promoting fatty acid oxidation, elevating high-density lipoprotein levels [3,31,52,53], and enhancing mitochondrial function, while calorie restriction is more effective in reducing body weight [54]. Specifically, calorie restriction reduces oxidative stress, whereas exercise induces oxidative stress in skeletal muscles. These findings suggest that the benefits of exercise and calorie restriction are distinct, indicating that their combination might circumvent the limitations of single interventions and provide greater overall benefits [55,56]. Additionally, studies have indicated that time-restricted eating alone can lead to a reduction in lean body mass. However, research involving individuals who regularly engage in exercise training has found that combining time-restricted eating with resistance training maintains or increases muscle mass while significantly reducing subcutaneous fat mass [44,45]. Several meta-analyses have corroborated that combining exercise and dietary interventions is more effective than either approach alone in improving body composition, glycemic markers, and lipid profiles [57–62].

Therefore, an increasing number of studies have focused on combining exercise with dietary interventions to explore whether this approach can yield more effective weight loss outcomes. However, the effects of combining exercise with various dietary interventions differ across studies, and there is currently no comprehensive literature comparing the effects of exercise combined with different dietary interventions. Consequently, this study aims to summarize the outcomes of combining exercise with different dietary interventions and perform a network meta-analysis to investigate the differences in their effects. The objective is to provide evidence-based recommendations for individuals seeking to combine exercise with dietary interventions.

2. Methods

2.1. Protocol and Registration

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [63]. It has been registered in PROSPERO (identifier CRD42024542184).

2.2. Search Strategy

A comprehensive search was conducted from inception to May 2024 in the following databases: PubMed, Web of Science, Embase, and Cochrane Library. Only the literature published in English was included. Relevant articles were independently reviewed and evaluated by the author team (Y.X. and L.Z.) based on the inclusion criteria. Disagreements regarding article inclusion or exclusion were resolved through discussion. The search terms are detailed in Supplementary File S1.

2.3. Inclusion Criteria and Exclusion Criteria

Inclusion Criteria:

(1) Must be a randomized controlled trial and include a group receiving a combination of exercise and dietary intervention.
(2) Must include a control group, which could be no intervention, exercise only, or dietary intervention only.
(3) Participants must be adults aged 18–65 years.
(4) Participants must be healthy individuals.
(5) Outcome measures must include at least one of the following: body weight, BMI, fat mass, or fat percentage.

Exclusion Criteria:

(1) Studies that are not randomized controlled trials.
(2) Non-human studies.
(3) Non-original studies, including reviews, letters, case reports, or papers that do not provide accurate and clear data.
(4) Studies where participants are children, elderly, or individuals with any diseases.

2.4. Data Extraction

Data were extracted from the literature using a pre-designed Excel 2019 spreadsheet, which included the study title, characteristics of study subjects, age, intervention methods, duration of intervention, and quality assessment of the literature. Two authors (Y.G. and Y.X.) independently extracted the data, and any disagreements were resolved through discussion with a third party (L.Z.). For studies where mean values were presented only in graphical format, Web Plot Digitizer (https://automeris.io/, accessed on 1 June 2024) was used to extract the data. If the data were not presented as "Mean ± SD," a standardized template for evidence-based medicine data extraction was used to convert them to the "Mean ± SD" format.

2.5. Risk of Bias Assessment

The included randomized controlled trials (RCTs) were assessed for quality using the Cochrane risk of bias tool. The assessment covered seven domains: random sequence generation/allocation concealment (selection bias), blinding of participants/personnel (performance bias), blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), selective reporting (reporting bias), and other biases. Each section was rated on three levels: low risk, high risk, and unclear. The quality of trials was assessed by two authors (Y.X. and L.Z.), and discrepancies were resolved through discussion with a third reviewer (Y.G.) to reach a consensus.

2.6. Statistical Analysis

Review Manager 5.3 was utilized to analyze the literature and generate the Risk of Bias summary and Risk of Bias graph. Stata MP 17 software was employed to conduct the network meta-analysis, assess the consistency between direct and indirect comparisons, compute the League Table for the four interventions, and calculate SUCRA rankings. Additionally, Network Plot, SUCRA Plot, and funnel plots were created. Results were summarized using standardized mean differences (SMD) and 95% confidence intervals (95% CI).

3. Results

3.1. Search Results and Study Selection

By May 2024, a total of 1752 articles were retrieved from the four databases: 253 from PubMed, 928 from Web of Science, 315 from Embase, and 256 from the Cochrane Library. After removing 367 duplicate articles, 1253 articles were excluded based on their titles or abstracts, leaving 132 articles for full-text review. Of these, eight articles could not be located. Subsequently, 46 articles were excluded for the following reasons: abstract only t, subjects aged over 65 years (n = 14), subjects under 18 years old (n = 3), participants with high blood pressure (n = 10), and studies that did not include exercise combined with dietary intervention (n = 16). Ultimately, 78 articles were included in the analysis (Figure 1).

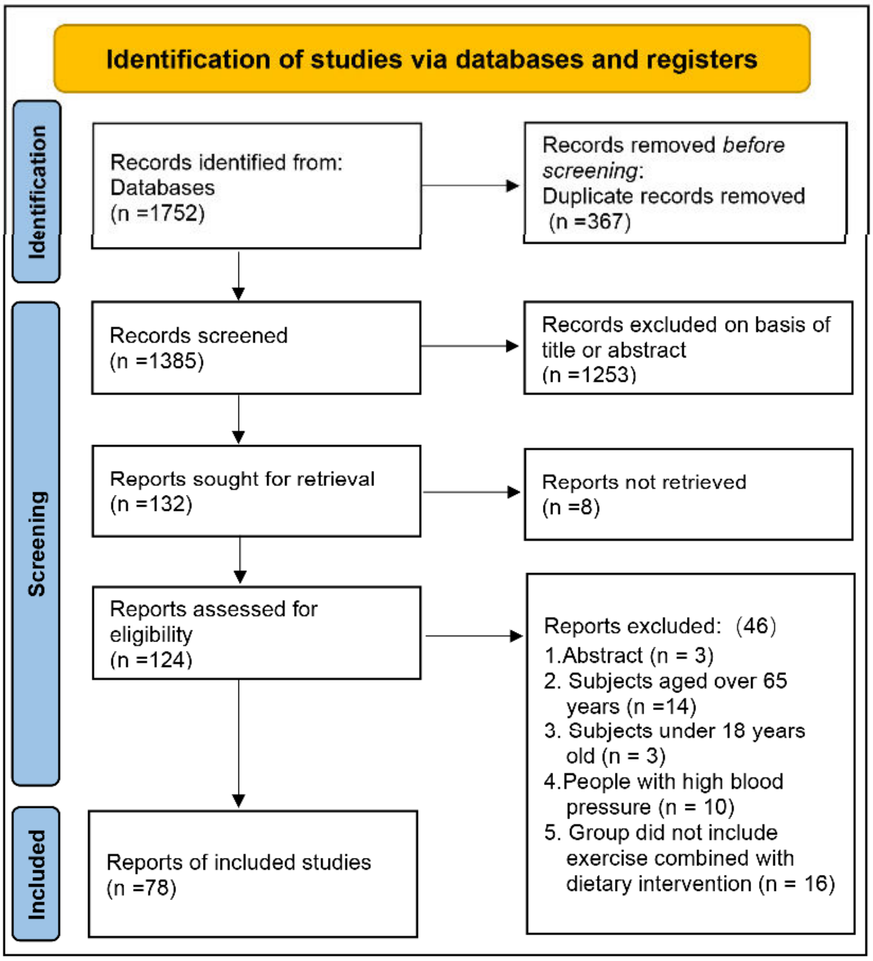


Figure 1. Flow diagram of study selection.

3.2. Study Characteristics

A total of 78 articles were included in the meta-analysis (Supplementary Table S1). These studies, conducted between 1995 and 2024, included 5219 participants aged 18–65 years. The duration of exercise interventions ranged from 4 weeks to 1 year, encompassing both aerobic exercise and resistance training. Dietary interventions included calorie restriction, 5:2 intermittent fasting, time-restricted eating, and the ketogenic diet. The specific characteristics of the studies are detailed in Supplementary Table S1. Among the results, 53 studies reported on exercise combined with calorie restriction, 3 studies reported on exercise combined with 5:2 intermittent fasting, 9 studies reported on exercise combined with time-restricted eating, and 9 studies reported on exercise combined with the ketogenic diet.

3.3. Risk of Bias in Included Studies

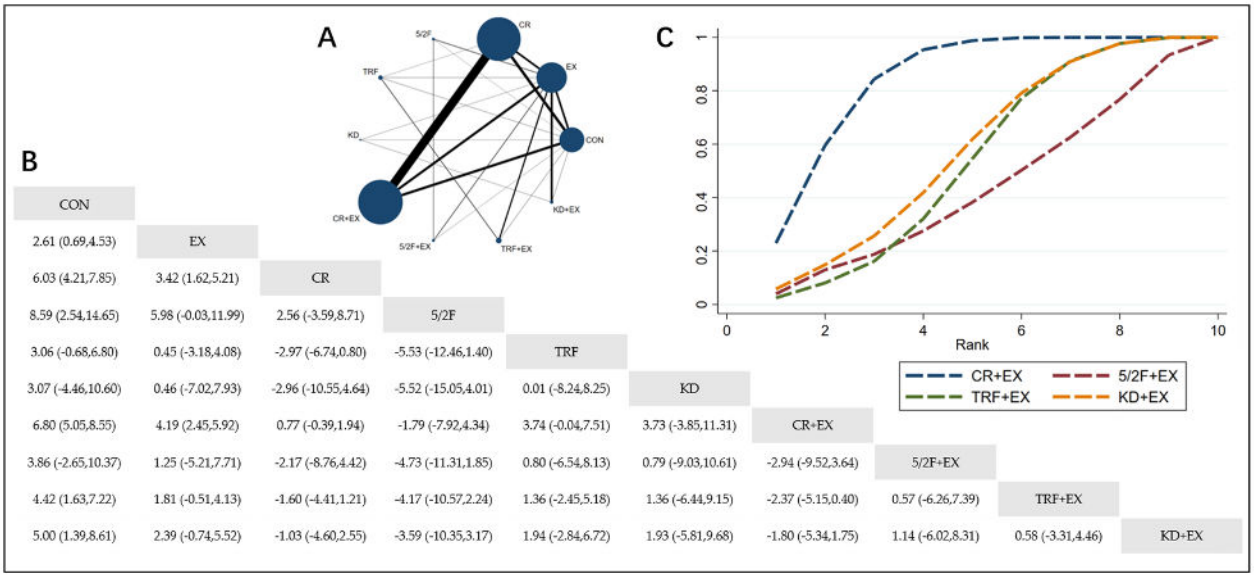
Of the 78 included studies, 7 could not be assessed for risk level in random sequence generation, 57 could not be assessed for risk level in allocation concealment, and 8 could not be assessed for risk level in incomplete outcome data. All evaluated studies were considered to have an unclear risk level for blinding of participants and personnel, as it is unlikely that the dietary and exercise interventions in the experimental groups could be blinded (Supplementary Figures S1 and S2).

3.4. Effects of the Interventions

We first conducted an inconsistency analysis. If significant inconsistency was detected, Bayesian models were employed for further analysis. If integration remained unachievable, subgroup analyses were performed based on age, gender, and type of exercise. When consistency was satisfactory, a Network Plot was created to explore the distribution of main characteristics across studies. Subsequently, a League Table was generated to obtain pairwise comparison data. Finally, a SUCRA Plot was drawn to determine the ranking of different intervention methods.

3.4.1. The Effect of Different Dietary Interventions Combined with Exercise on Body Weight

The Network Plot, League Table, and SUCRA Plot for the effects of different dietary interventions combined with exercise on body weight are shown in Figure 2.



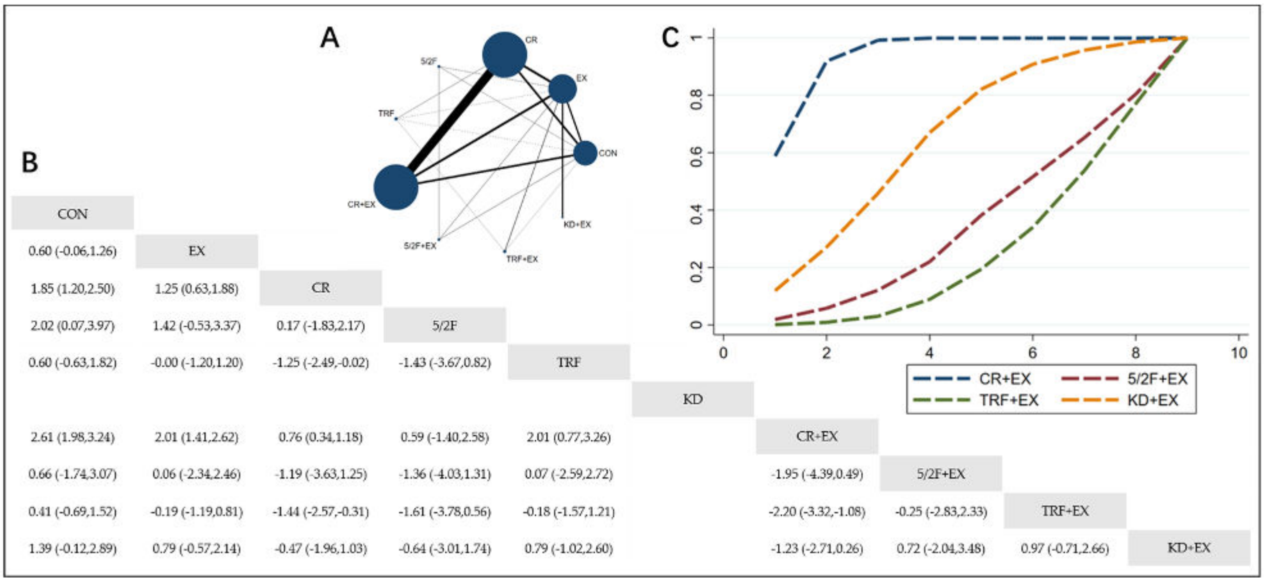
CON									
2.61 (0.69,4.53)	EX								
6.03 (4.21,7.85)	3.42 (1.62,5.21)	CR							
8.59 (2.54,14.65)	5.98 (-0.03,11.99)	2.56 (-3.59,8.71)	5/2F						
3.06 (-0.68,6.80)	0.45 (-3.18,4.08)	-2.97 (-6.74,0.80)	-5.53 (-12.46,1.40)	TRF					
3.07 (-4.46,10.60)	0.46 (-7.02,7.93)	-2.96 (-10.55,4.64)	-5.52 (-15.05,4.01)	0.01 (-8.24,8.25)	KD				
6.80 (5.05,8.55)	4.19 (2.45,5.92)	0.77 (-0.39,1.94)	-1.79 (-7.92,4.34)	3.74 (-0.04,7.51)	3.73 (-3.85,11.31)	CR+EX			
3.86 (-2.65,10.37)	1.25 (-5.21,7.71)	-2.17 (-8.76,4.42)	-4.73 (-11.31,1.85)	0.80 (-6.54,8.13)	0.79 (-9.03,10.61)	-2.94 (-9.52,3.64)	5/2F+EX		
4.42 (1.63,7.22)	1.81 (-0.51,4.13)	-1.60 (-4.41,1.21)	-4.17 (-10.57,2.24)	1.36 (-2.45,5.18)	1.36 (-6.44,9.15)	-2.37 (-5.15,0.40)	0.57 (-6.26,7.39)	TRF+EX	
5.00 (1.39,8.61)	2.39 (-0.74,5.52)	-1.03 (-4.60,2.55)	-3.59 (-10.35,3.17)	1.94 (-2.84,6.72)	1.93 (-5.81,9.68)	-1.80 (-5.34,1.75)	1.14 (-6.02,8.31)	0.58 (-3.31,4.46)	KD+EX

Figure 2. Network Meta-Analysis of Weight: Network Plot, League Table, and SUCRA Plot. (**A**) Network Plot. The size of the nodes is proportional to the sample size of each dietary intervention, and the thickness of the lines corresponds to the number of available studies. (**B**) Pairwise comparison League Table, where the estimated effect size differences (SMD with 95% CI) represent the difference between the intervention on the top and the intervention on the right. (**C**) The SUCRA Plot, where the size of the area under the curve indicates the effectiveness of each intervention.

As shown in Figure 2A, most of the included studies primarily compare the effects of calorie restriction combined with exercise versus calorie restriction alone. The groups with calorie restriction combined with exercise, calorie restriction alone, exercise alone, and control groups dominate in terms of participant numbers. Figure 2B summarizes the estimated effect size differences (SMD with 95% CI) for the pairwise comparisons of the 10 intervention methods. Compared to the exercise-alone (EX) group, the calorie restriction combined with exercise (CR + EX) group shows a significant weight reduction, while the weight reductions in the 5/2 intermittent fasting combined with exercise (5/2F + EX), time-restricted feeding combined with exercise (TRF + EX), and ketogenic diet combined with exercise (KD + EX) groups are not significant. Figure 2C presents the SUCRA rankings for the four intervention methods, where the size of the area under the curve represents the effectiveness of the intervention. The larger the area under the curve, the higher the ranking of the intervention's effectiveness. As shown in the figure, for weight reduction, the ranking of the four interventions is as follows: CR + EX > KD + EX > TRF + EX > 5/2F + EX.

3.4.2. The Effect of Different Dietary Interventions Combined with Exercise on BMI

The Network Plot, League Table, and SUCRA Plot for the effects of different dietary interventions combined with exercise on BMI are shown in Figure 3.



CON									
0.60 (-0.06,1.26)	EX								
1.85 (1.20,2.50)	1.25 (0.63,1.88)	CR							
2.02 (0.07,3.97)	1.42 (-0.53,3.37)	0.17 (-1.83,2.17)	5/2F						
0.60 (-0.63,1.82)	-0.00 (-1.20,1.20)	-1.25 (-2.49,-0.02)	-1.43 (-3.67,0.82)	TRF					
					KD				
2.61 (1.98,3.24)	2.01 (1.41,2.62)	0.76 (0.34,1.18)	0.59 (-1.40,2.58)	2.01 (0.77,3.26)		CR+EX			
0.66 (-1.74,3.07)	0.06 (-2.34,2.46)	-1.19 (-3.63,1.25)	-1.36 (-4.03,1.31)	0.07 (-2.59,2.72)		-1.95 (-4.39,0.49)	5/2F+EX		
0.41 (-0.69,1.52)	-0.19 (-1.19,0.81)	-1.44 (-2.57,-0.31)	-1.61 (-3.78,0.56)	-0.18 (-1.57,1.21)		-2.20 (-3.32,-1.08)	-0.25 (-2.83,2.33)	TRF+EX	
1.39 (-0.12,2.89)	0.79 (-0.57,2.14)	-0.47 (-1.96,1.03)	-0.64 (-3.01,1.74)	0.79 (-1.02,2.60)		-1.23 (-2.71,0.26)	0.72 (-2.04,3.48)	0.97 (-0.71,2.66)	KD+EX

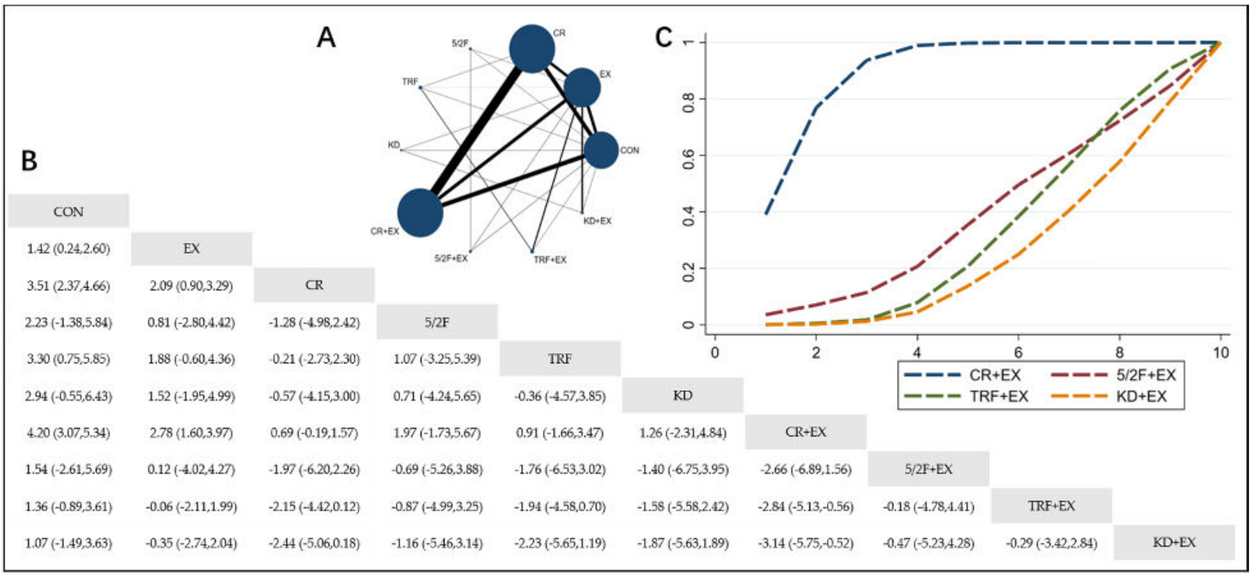
Figure 3. Network Meta-Analysis of BMI: Network Plot, League Table, and SUCRA Plot. (**A**) Network Plot. The size of the nodes is proportional to the sample size of each dietary intervention, and the thickness of the lines corresponds to the number of available studies. (**B**) Pairwise comparison League Table, where the estimated effect size differences (SMD with 95% CI) represent the difference between the intervention on the top and the intervention on the right. (**C**) The SUCRA Plot, where the size of the area under the curve indicates the effectiveness of each intervention.

As shown in Figure 3A, most of the included studies primarily compare the effects of calorie restriction combined with exercise versus calorie restriction alone. The groups with calorie restriction combined with exercise, calorie restriction alone, exercise alone, and control groups dominate in terms of participant numbers. Notably, no studies included in the analysis examine the effect of the ketogenic diet (KD) on BMI. Figure 3B summarizes the estimated effect size differences (SMD with 95% CI) for the pairwise comparisons. Compared to the exercise-alone (EX) group, the calorie restriction combined with exercise (CR + EX) group shows a significant reduction in BMI, while the 5/2 intermittent fasting combined with exercise (5/2F + EX) and ketogenic diet combined with exercise (KD + EX) groups do not show significant reductions. The time-restricted feeding combined with exercise (TRF + EX) group even shows a trend towards increasing BMI. Figure 3C presents the SUCRA rankings for BMI reduction, where the size of the area under the curve represents the effectiveness of each intervention. For BMI reduction, the ranking of the four interventions is as follows: CR + EX > KD + EX > 5/2F + EX > TRF + EX.

3.4.3. The Effect of Different Dietary Interventions Combined with Exercise on Body Fat Percentage

The Network Plot, League Table, and SUCRA Plot for the effects of different dietary interventions combined with exercise on body fat percentage are shown in Figure 4.

As shown in Figure 4A, most of the included studies primarily compare the effects of calorie restriction combined with exercise versus calorie restriction alone. The groups with calorie restriction combined with exercise, calorie restriction alone, exercise alone, and control groups dominate in terms of participant numbers. Figure 4B summarizes the estimated effect size differences (SMD with 95% CI) for the pairwise comparisons. Compared to the exercise-alone (EX) group, the calorie restriction combined with exercise (CR + EX) group shows a significant reduction in body fat percentage. The 5/2 intermittent fasting combined with exercise (5/2F + EX) group does not show a significant reduction, while the time-restricted feeding combined with exercise (TRF + EX) and ketogenic diet combined with exercise (KD + EX) groups show a trend towards increasing body fat percentage. Figure 4C presents the SUCRA rankings for body fat percentage reduction, where the size of the area under the curve represents the effectiveness of each intervention. For reducing body fat percentage, the ranking of the four interventions is as follows: CR + EX > 5/2F + EX > TRF + EX > KD + EX.



CON									
1.42 (0.24,2.60)	EX								
3.51 (2.37,4.66)	2.09 (0.90,3.29)	CR							
2.23 (-1.38,5.84)	0.81 (-2.80,4.42)	-1.28 (-4.98,2.42)	5/2F						
3.30 (0.75,5.85)	1.88 (-0.60,4.36)	-0.21 (-2.73,2.30)	1.07 (-3.25,5.39)	TRF					
2.94 (-0.55,6.43)	1.52 (-1.95,4.99)	-0.57 (-4.15,3.00)	0.71 (-4.24,5.65)	-0.36 (-4.57,3.85)	KD				
4.20 (3.07,5.34)	2.78 (1.60,3.97)	0.69 (-0.19,1.57)	1.97 (-1.73,5.67)	0.91 (-1.66,3.47)	1.26 (-2.31,4.84)	CR+EX			
1.54 (-2.61,5.69)	0.12 (-4.02,4.27)	-1.97 (-6.20,2.26)	-0.69 (-5.26,3.88)	-1.76 (-6.53,3.02)	-1.40 (-6.75,3.95)	-2.66 (-6.89,1.56)	5/2F+EX		
1.36 (-0.89,3.61)	-0.06 (-2.11,1.99)	-2.15 (-4.42,0.12)	-0.87 (-4.99,3.25)	-1.94 (-4.58,0.70)	-1.58 (-5.58,2.42)	-2.84 (-5.13,-0.56)	-0.18 (-4.78,4.41)	TRF+EX	
1.07 (-1.49,3.63)	-0.35 (-2.74,2.04)	-2.44 (-5.06,0.18)	-1.16 (-5.46,3.14)	-2.23 (-5.65,1.19)	-1.87 (-5.63,1.89)	-3.14 (-5.75,-0.52)	-0.47 (-5.23,4.28)	-0.29 (-3.42,2.84)	KD+EX

Figure 4. Network Meta-Analysis of Body fat percentage: Network Plot, League Table, and SUCRA Plot. (**A**) Network Plot. The size of the nodes is proportional to the sample size of each dietary intervention, and the thickness of the lines corresponds to the number of available studies. (**B**) Pairwise comparison League Table, where the estimated effect size differences (SMD with 95% CI) represent the difference between the intervention on the top and the intervention on the right. (**C**) The SUCRA Plot, where the size of the area under the curve indicates the effectiveness of each intervention.

3.4.4. The Effect of Different Dietary Interventions Combined with Exercise on Lean Body Mass

An inconsistency analysis of lean body mass data revealed significant inconsistency (p = 0.004). Factors contributing to this inconsistency include differences in study design, baseline characteristics, measurement methods, publication bias, statistical model selection, and heterogeneity among the included studies. Initially, we attempted to address this by changing the statistical model and using GeMTC software 0.14.3 based on Bayesian models for verification. However, consistency checks could not be performed, indicating a high degree of inconsistency in the data. Suspecting heterogeneity among the included studies, we conducted subgroup analyses. When performing subgroup analysis based on whether the participants were obese, the non-obese group did not form a network due to insufficient data, while significant inconsistency remained in the obese group (p = 0.0022). We then conducted subgroup analysis based on intervention duration, whether it was less than or equal to 8 weeks. The results showed good consistency in the subgroup with an intervention duration of 8 weeks or less (p = 0.3884), but significant inconsistency in the subgroup with an intervention duration of more than 8 weeks (p = 0.0001). Next, we performed subgroup analysis based on exercise type. Significant inconsistency was found in the aerobic exercise subgroup (p = 0.001), but good consistency was observed in the resistance exercise and mixed exercise subgroups (resistance exercise: p = 0.2355; mixed exercise: p = 0.9881). Finally, subgroup analysis based on gender showed good consistency in both subgroups (women: p = 0.1759; men: p = 0.2033). We concluded that gender might be one of the most important factors affecting lean body mass. Therefore, we conducted network meta-analyses separately for different genders, as shown in Figures 5 and 6.

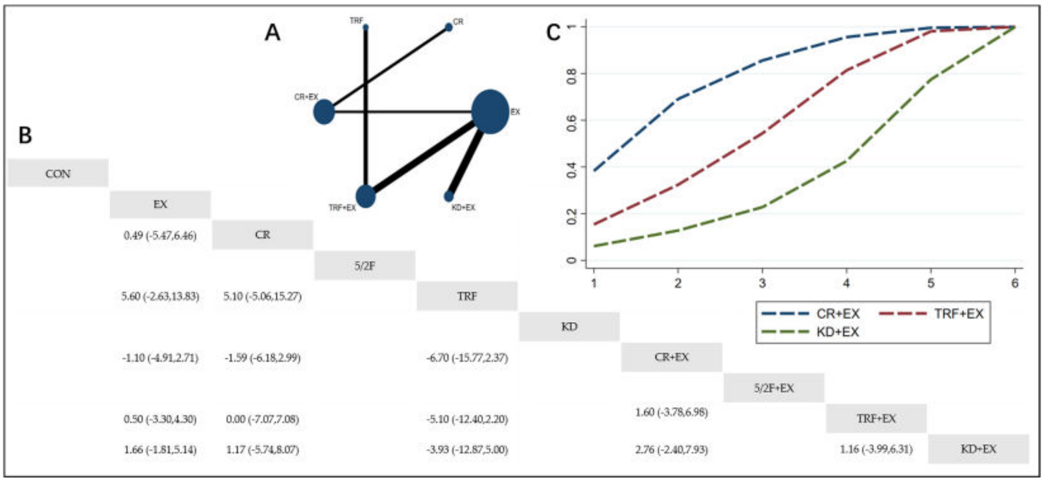


Figure 5. Network Meta-Analysis of male lean body mass: Network Plot, League Table, and SUCRA Plot. (**A**) Network Plot. The size of the nodes is proportional to the sample size of each dietary intervention, and the thickness of the lines corresponds to the number of available studies. (**B**) Pairwise comparison League Table, where the estimated effect size differences (SMD with 95% CI) represent the difference between the intervention on the top and the intervention on the right. (**C**) The SUCRA Plot, where the size of the area under the curve indicates the effectiveness of each intervention.

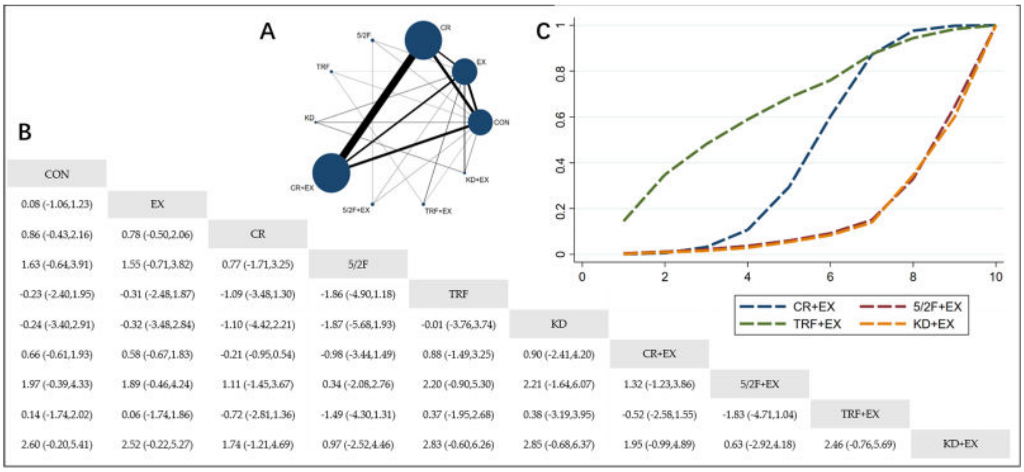


Figure 6. Network Meta-Analysis of female lean body mass: Network Plot, League Table, and SUCRA Plot. (**A**) Network Plot. The size of the nodes is proportional to the sample size of each dietary intervention, and the thickness of the lines corresponds to the number of available studies. (**B**) Pairwise comparison League Table, where the estimated effect size differences (SMD with 95% CI) represent the difference between the intervention on the top and the intervention on the right. (**C**) The SUCRA Plot, where the size of the area under the curve indicates the effectiveness of each intervention.

As shown in Figure 5A, most of the included studies primarily compare the effects of exercise alone (EX) versus time-restricted feeding combined with exercise (TRF + EX) or ketogenic diet combined with exercise (KD + EX). The groups with calorie restriction combined with exercise (CR + EX), EX, and TRF + EX dominate in terms of participant numbers. Figure 5B shows that there are no significant differences between the groups. Compared to the EX group, the CR + EX group shows an upward trend in lean body mass, while the other groups show a downward trend. As shown in Figure 5C, for maintaining lean body mass in men, the ranking of the interventions is as follows: CR + EX > TRF + EX > KD + EX.

As shown in Figure 6A, most of the included studies primarily compare the effects of calorie restriction combined with exercise (CR + EX) versus calorie restriction alone (CR).

The groups with CR, CR + EX, exercise alone (EX), and control (CON) dominate in terms of participant numbers. Figure 6B shows that there are no significant differences between the groups. Compared to the EX group, the CR + EX, 5/2 intermittent fasting combined with exercise (5/2F + EX), time-restricted feeding combined with exercise (TRF + EX), and ketogenic diet combined with exercise (KD + EX) groups show a downward trend in lean body mass. As shown in Figure 6C, for maintaining lean body mass in women, the ranking of the effectiveness of the four interventions is as follows: TRF + EX > CR + EX > 5/2F + EX > KD + EX.

4. Discussion

Our network meta-analysis included 78 controlled trials to assess the effects of combining exercise with different dietary interventions on body composition. By summarizing the included studies, we ranked the effects of four dietary interventions—calorie restriction (CR), 5/2 intermittent fasting (5/2F), time-restricted feeding (TRF), and the ketogenic diet (KD)—combined with exercise (aerobic, resistance, and mixed exercise) on body composition. Our results indicate that, compared to the other three interventions, combining exercise with calorie restriction is the most effective for reducing weight, BMI, and body fat percentage. For men, combining exercise with calorie restriction is the best approach to maintain lean body mass, while for women, combining exercise with time-restricted feeding is the most effective method for maintaining lean body mass. For exercise types, we conducted a subgroup analysis, categorizing the studies into three groups: aerobic exercise, resistance training, and mixed exercise. The results of the subgroup analysis showed that the trends in the effects of these three types of exercise combined with different dietary interventions on weight, body fat percentage, and lean body mass were generally consistent. However, there were some minor differences. Specifically, for weight reduction, when resistance training was performed, the combination with intermittent fasting was more effective than with calorie restriction or the ketogenic diet (Supplementary Tables S2–S8).

Dietary and exercise interventions have a significant impact on overall health improvement. Numerous studies have shown that dietary interventions can improve the body's inflammatory state [64], lower blood pressure, reduce blood lipids, and even alleviate symptoms such as body pain [65]. It is not only the nutritional content that positively affects the body; the quantity and timing of intake can also produce remarkable effects. Consistent with previous research, our study's results indicate that any dietary intervention is more effective than exercise alone in reducing weight. Peven's study suggests that even when exercise exceeds the recommended amount in physical activity guidelines, it is not as effective as dietary interventions for weight loss [54], supporting the findings of this NMA. CR + EX is significantly more effective in weight reduction compared to other interventions. The primary reason for this might be that CR + EX clearly defines daily caloric intake, preventing increased caloric intake due to the additional consumption brought by exercise. Although some studies have shown that intermittent fasting does not lead to compensatory eating behaviors [66–69] and reduces total intake by approximately 25% compared to normal eating patterns [70], when intermittent fasting and the ketogenic diet are combined with exercise, the enhanced metabolism induced by exercise can cause significant fluctuations in intake during feeding periods. This might lead to higher intake than dietary interventions alone, indirectly explaining why the weight reduction effect of exercise is not prominent, possibly due to increased intake. When total caloric intake is restricted, the additional consumption brought by exercise is reflected in weight loss. Subsequently, we conducted a subgroup analysis based on the type of exercise. The results remained consistent with the overall analysis when aerobic and mixed exercises were performed. Only when resistance exercise was performed did TRF + EX prove to be more effective than CR + EX. This finding requires further direct comparative research for verification. For BMI, our study's results are largely consistent with those for weight. The BMI formula is weight divided by the square of height, so its trend is generally consistent with the trend in weight.

To explore the effects of combining exercise with dietary interventions in the body, it is important not only to focus on weight loss but also to consider changes in body composition, particularly fat reduction [71,72]. Our study shows that for reducing body fat percentage, CR + EX is the most effective, while the other three interventions have similar effects, with KD + EX being the least effective in reducing body fat percentage. The reason for this may be that CR + EX creates a caloric deficit, and exercise helps maintain muscle mass and basal metabolic rate, resulting in these caloric deficits being reflected in reduced fat mass. Eglseer's network meta-analysis also demonstrated that calorie restriction combined with exercise is the most effective in reducing fat mass [73]. The least effective intervention, KD + EX, might be due to the high fat intake, leading to fat accumulation in the body. Although some studies indicate that the ketogenic diet can promote glucose and fat metabolism [74] and significantly reduce total cholesterol, low-density lipoprotein, and triglycerides [75,76], other research in the literature suggests that the ketogenic diet does not lead to weight gain but can slightly increase fat mass and fat percentage [77]. In our study, when comparing exercise combined with other dietary interventions, KD + EX might be effective in reducing body fat percentage compared to a control group, but the other three interventions are more effective. Interestingly, our study found that for reducing body fat percentage, the effect of TRF + EX is worse than TRF alone, 5/2F + EX is worse than 5/2F alone, and KD + EX is worse than KD alone. There might be three reasons for this outcome. First, it could be because exercise promotes fat absorption and storage during dietary interventions. Since fat is the most efficient energy source, the body may accumulate more fat once an exercise routine is established compared to the dietary intervention alone. Second, changes in body weight might affect body fat percentage. If the reduction in body weight is greater than the reduction in fat mass, the body fat percentage might increase. Regardless, body fat percentage is an important indicator of health, and an increase generally signifies adverse events. Lastly, upon closely examining the articles involving changes in body fat percentage, we found that while the fat data showed good consistency, the direct comparison results between groups did not show significant differences. Therefore, the final results might have been influenced by indirect comparisons, leading to significant findings. This aspect needs further experimental validation.

Studies have shown that the loss of muscle mass and strength poses serious challenges to physical function and carries significant health risks, including increased disability, frailty, and mortality [78,79]. Therefore, maintaining lean body mass is critically important. The results of the four intervention methods on maintaining lean body mass showed significant inconsistency (p = 0.004). To address this inconsistency, we first changed the statistical model and used the Bayesian-model-based GeMTC software for verification, but we were unable to perform consistency checks. We then suspected that heterogeneity among the included studies might be a factor. Some studies indicate that the type of exercise and the gender of the subjects greatly influence lean body mass. Furrer et al. demonstrated that resistance training typically leads to a significant increase in muscle fiber size, while endurance training mainly induces mitochondrial biogenesis and metabolic remodeling, resulting in enhanced oxidative capacity without substantially affecting absolute muscle mass [80]. We then conducted subgroup analysis based on the type of exercise. We found that the aerobic exercise subgroup still showed significant inconsistency (p = 0.001), but the resistance training and mixed exercise subgroups showed good consistency (resistance training: p = 0.2355; mixed exercise: p = 0.9881). Consequently, we ranked the effects of dietary interventions combined with resistance or mixed exercise on lean body mass, concluding that CR + EX and TRF + EX are the most effective in maintaining lean body mass. Genton et al. indicated that physical activity could delay lean body mass loss in men but not in women [81], although some research suggests this might be due to the lower intensity of physical activity in women compared to men [82]. If gender significantly impacts lean body mass maintenance, studies with a large difference in the number of male and female participants could lead to significant inconsistency. Our NMA results showed good consistency in both subgroups (women: p = 0.1759; men: p = 0.2033). Ultimately, we chose to conduct subgroup analyses by gender to avoid significant inconsistency, and our results confirmed the impact of gender on lean body mass maintenance.

For men, the best way to maintain lean body mass is CR + EX. For women, the best way to maintain lean body mass is TRF + EX. For both men and women, the least effective method for maintaining lean body mass is KD + EX. Research indicates that the ketogenic diet can reduce glycogen storage in muscles [83,84]. In muscles, glycogen is not stored alone but is combined with water in a ratio of 1:3 [85]. The ketogenic diet, often high in saturated fats, may lack essential nutrients, particularly carbohydrates, dietary fiber, and micronutrients such as calcium, magnesium, potassium, and vitamins A, B, and B6 [86,87]. Without sufficient carbohydrates in the diet, glycogen accumulation decreases, ultimately leading to a reduction in absolute lean body mass [88]. There is evidence that in untrained individuals, the ketogenic diet may lead to slightly higher lean body mass loss compared to a normal diet [89–91]. A meta-analysis assessing the impact of exercise combined with the ketogenic diet on body composition found that the ketogenic diet group had significantly lower lean body mass compared to the non-ketogenic diet group [92]. Some studies suggest that the ketogenic diet increases AMPK activity, which can inhibit mTOR signaling, a key regulator of muscle mass increase [93]. Other research indicates that long-term ketogenic diets may promote inflammation and increase the risk of cellular aging [94]. Thus, our NMA concludes that exercise combined with the ketogenic diet is the least recommended among the four intervention methods.

Strengths and Limitations

The abundance of articles on dietary interventions provided a solid research foundation for this study, enhancing the accuracy of the results. However, there is a lack of literature directly comparing the four dietary interventions combined with exercise, which makes the results more susceptible to the influence of indirect comparisons.

5. Conclusions

The results of this NMA indicate that combining calorie restriction with exercise yields the best overall effects on weight reduction, body fat percentage reduction, and maintenance of lean body mass, making it the optimal choice for improving body composition. Following this is time-restricted eating combined with exercise, which has a slightly lesser impact on body composition compared to calorie restriction combined with exercise. Notably, time-restricted eating combined with exercise is the most effective method for maintaining lean body mass in women. Although combining exercise with a ketogenic diet is effective for weight reduction, it is less effective in reducing body fat percentage and maintaining lean body mass compared to other interventions, making it a less favorable choice.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/nu16173007/s1, File S1: Searching Strategy; Figure S1: Risk of bias summary; Figure S2: Risk of bias graph; Table S1: Characteristic of included trials; Table S2: Effects of aerobic exercise combined with different dietary interventions on body weight; Table S3: Effects of resistance exercise combined with different dietary interventions on body weight; Table S4: Effects of mixed exercise combined with different dietary interventions on body weight; Table S5: Effects of aerobic exercise combined with different dietary interventions on body fat percentage; Table S6: Effects of mixed exercise combined with different dietary interventions on body fat percentage; Table S7: Effects of resistance exercise combined with different dietary interventions on lean body mass; Table S8: Effects of mixed exercise combined with different dietary interventions on lean body mass. References [95–173] are cited in the Supplementary Materials.

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References

1. Kong, Z.; Sun, S.; Shi, Q.; Zhang, H.; Tong, T.K.; Nie, J. Short-Term Ketogenic Diet Improves Abdominal Obesity in Overweight/Obese Chinese Young Females. *Front. Physiol.* **2020**, *11*, 856. [CrossRef]
2. Johnstone, A.M.; Horgan, G.W.; Murison, S.D.; Bremner, D.M.; Lobley, G.E. Effects of a High-Protein Ketogenic Diet on Hunger, Appetite, and Weight Loss in Obese Men Feeding Ad Libitum. *Am. J. Clin. Nutr.* **2008**, *87*, 44–55. [CrossRef] [PubMed]
3. Varady, K.A.; Bhutani, S.; Church, E.C.; Klempel, M.C. Short-Term Modified Alternate-Day Fasting: A Novel Dietary Strategy for Weight Loss and Cardioprotection in Obese Adults12. *Am. J. Clin. Nutr.* **2009**, *90*, 1138–1143. [CrossRef]
4. Sutton, E.F.; Beyl, R.; Early, K.S.; Cefalu, W.T.; Ravussin, E.; Peterson, C.M. Early Time-Restricted Feeding Improves Insulin Sensitivity, Blood Pressure, and Oxidative Stress Even without Weight Loss in Men with Prediabetes. *Cell Metab.* **2018**, *27*, 1212–1221. [CrossRef] [PubMed]
5. Harvie, M.N.; Pegington, M.; Mattson, M.P.; Frystyk, J.; Dillon, B.; Evans, G.; Cuzick, J.; Jebb, S.A.; Martin, B.; Cutler, R.G.; et al. The Effects of Intermittent or Continuous Energy Restriction on Weight Loss and Metabolic Disease Risk Markers: A Randomized Trial in Young Overweight Women. *Int. J. Obes.* **2011**, *35*, 714–727. [CrossRef]
6. Parvaresh, A.; Razavi, R.; Abbasi, B.; Yaghoobloo, K.; Hassanzadeh, A.; Mohammadifard, N.; Safavi, S.M.; Hadi, A.; Clark, C.C.T. Modified Alternate-Day Fasting vs. Calorie Restriction in the Treatment of Patients with Metabolic Syndrome: A Randomized Clinical Trial. *Complement. Ther. Med.* **2019**, *47*, 102187. [CrossRef]
7. Sundfør, T.M.; Svendsen, M.; Tonstad, S. Effect of Intermittent versus Continuous Energy Restriction on Weight Loss, Maintenance and Cardiometabolic Risk: A Randomized 1-Year Trial. *Nutr. Metab. Cardiovasc. Dis.* **2018**, *28*, 698–706. [CrossRef] [PubMed]
8. Gabel, K.; Hoddy, K.K.; Haggerty, N.; Song, J.; Kroeger, C.M.; Trepanowski, J.F.; Panda, S.; Varady, K.A. Effects of 8-Hour Time Restricted Feeding on Body Weight and Metabolic Disease Risk Factors in Obese Adults: A Pilot Study. *Nutr. Healthy Aging* **2018**, *4*, 345–353. [CrossRef]
9. Lettieri-Barbato, D.; Cannata, S.M.; Casagrande, V.; Ciriolo, M.R.; Aquilano, K. Time-controlled fasting prevents aging-like mitochondrial changes induced by persistent dietary fat overload in skeletal muscle. *PLoS ONE* **2018**, *13*, e0195912. [CrossRef]
10. Lanza, I.R.; Zabielski, P.; Klaus, K.A.; Morse, D.M.; Heppelmann, C.J.; Bergen, H.R.; Dasari, S.; Walrand, S.; Short, K.R.; Johnson, M.L.; et al. Chronic Caloric Restriction Preserves Mitochondrial Function in Senescence without Increasing Mitochondrial Biogenesis. *Cell Metab.* **2012**, *16*, 777–788. [CrossRef]
11. Miller, V.J.; Villamena, F.A.; Volek, J.S. Nutritional Ketosis and Mitohormesis: Potential Implications for Mitochondrial Function and Human Health. *J. Nutr. Metab.* **2018**, *2018*, 5157645. [CrossRef] [PubMed]
12. Johnson, J.B.; Summer, W.; Cutler, R.G.; Martin, B.; Hyun, D.-H.; Dixit, V.D.; Pearson, M.; Nassar, M.; Telljohann, R.; Maudsley, S.; et al. Alternate Day Calorie Restriction Improves Clinical Findings and Reduces Markers of Oxidative Stress and Inflammation in Overweight Adults with Moderate Asthma. *Free Radic. Biol. Med.* **2007**, *42*, 665–674. [CrossRef]
13. Cienfuegos, S.; Gabel, K.; Kalam, F.; Ezpeleta, M.; Wiseman, E.; Pavlou, V.; Lin, S.; Oliveira, M.L.; Varady, K.A. Effects of 4- and 6-h Time-Restricted Feeding on Weight and Cardiometabolic Health: A Randomized Controlled Trial in Adults with Obesity. *Cell Metab.* **2020**, *32*, 366–378. [CrossRef] [PubMed]
14. Manning, P.J.; Sutherland, W.H.F.; Walker, R.J.; Williams, S.M.; De Jong, S.A.; Ryalls, A.R.; Berry, E.A. Effect of High-Dose Vitamin E on Insulin Resistance and Associated Parameters in Overweight Subjects. *Diabetes Care* **2004**, *27*, 2166–2171. [CrossRef] [PubMed]
15. Rains, J.L.; Jain, S.K. Oxidative Stress, Insulin Signaling, and Diabetes. *Free Radic. Biol. Med.* **2011**, *50*, 567–575. [CrossRef]
16. Houstis, N.; Rosen, E.D.; Lander, E.S. Reactive Oxygen Species Have a Causal Role in Multiple Forms of Insulin Resistance. *Nature* **2006**, *440*, 944–948. [CrossRef]
17. Zaulkffali, A.S.; Md Razip, N.N.; Syed Alwi, S.S.; Abd Jalil, A.; Abd Mutalib, M.S.; Gopalsamy, B.; Chang, S.K.; Zainal, Z.; Ibrahim, N.N.; Zakaria, Z.A.; et al. Vitamins D and E Stimulate the PI3K-AKT Signalling Pathway in Insulin-Resistant SK-N-SH Neuronal Cells. *Nutrients* **2019**, *11*, 2525. [CrossRef]
18. Wang, S.; Huang, M.; You, X.; Zhao, J.; Chen, L.; Wang, L.; Luo, Y.; Chen, Y. Gut Microbiota Mediates the Anti-Obesity Effect of Calorie Restriction in Mice. *Sci. Rep.* **2018**, *8*, 13037. [CrossRef]
19. Fabbiano, S.; Suárez-Zamorano, N.; Chevalier, C.; Lazarević, V.; Kieser, S.; Rigo, D.; Leo, S.; Veyrat-Durebex, C.; Gaïa, N.; Maresca, M.; et al. Functional Gut Microbiota Remodeling Contributes to the Caloric Restriction-Induced Metabolic Improvements. *Cell Metab.* **2018**, *28*, 907–921. [CrossRef]
20. Liu, Z.; Dai, X.; Zhang, H.; Shi, R.; Hui, Y.; Jin, X.; Zhang, W.; Wang, L.; Wang, Q.; Wang, D.; et al. Gut Microbiota Mediates Intermittent-Fasting Alleviation of Diabetes-Induced Cognitive Impairment. *Nat. Commun.* **2020**, *11*, 855. [CrossRef]

21. Paoli, A.; Mancin, L.; Bianco, A.; Thomas, E.; Mota, J.F.; Piccini, F. Ketogenic Diet and Microbiota: Friends or Enemies? *Genes* **2019**, *10*, 534. [CrossRef] [PubMed]
22. Kalaany, N.Y.; Sabatini, D.M. Tumours with PI3K Activation Are Resistant to Dietary Restriction. *Nature* **2009**, *458*, 725–731. [CrossRef] [PubMed]
23. Li, Z.; Zhang, Z.; Ren, Y.; Wang, Y.; Fang, J.; Yue, H.; Ma, S.; Guan, F. Aging and Age-related Diseases: From Mechanisms to Therapeutic Strategies. *Biogerontology* **2021**, *22*, 165–187. [CrossRef] [PubMed]
24. O'Flanagan, C.H.; Smith, L.A.; McDonell, S.B.; Hursting, S.D. When Less May Be More: Calorie Restriction and Response to Cancer Therapy. *BMC Med.* **2017**, *15*, 106. [CrossRef]
25. Meydani, S.N.; Das, S.K.; Pieper, C.F.; Lewis, M.R.; Klein, S.; Dixit, V.D.; Gupta, A.K.; Villareal, D.T.; Bhapkar, M.; Huang, M.; et al. Long-Term Moderate Calorie Restriction Inhibits Inflammation without Impairing Cell-Mediated Immunity: A Randomized Controlled Trial in Non-Obese Humans. *Aging* **2016**, *8*, 1416–1431. [CrossRef]
26. Das, J.K.; Banskota, N.; Candia, J.; Griswold, M.E.; Orenduff, M.; de Cabo, R.; Corcoran, D.L.; Das, S.K.; De, S.; Huffman, K.M.; et al. Calorie Restriction Modulates the Transcription of Genes Related to Stress Response and Longevity in Human Muscle: The CALERIE Study. *Aging Cell* **2023**, *22*, e13963. [CrossRef]
27. Dorling, J.L.; Ravussin, E.; Redman, L.M.; Bhapkar, M.; Huffman, K.M.; Racette, S.B.; Das, S.K.; Apolzan, J.W.; Kraus, W.E.; Höchsmann, C.; et al. Effect of 2 Years of Calorie Restriction on Liver Biomarkers: Results from the CALERIE Phase 2 Randomized Controlled Trial. *Eur. J. Nutr.* **2021**, *60*, 1633–1643. [CrossRef]
28. Kraus, W.E.; Bhapkar, M.; Huffman, K.M.; Pieper, C.F.; Krupa Das, S.; Redman, L.M.; Villareal, D.T.; Rochon, J.; Roberts, S.B.; Ravussin, E.; et al. 2 Years of Calorie Restriction and Cardiometabolic Risk (CALERIE): Exploratory Outcomes of a Multicentre, Phase 2, Randomised Controlled Trial. *Lancet Diabetes Endocrinol.* **2019**, *7*, 673–683. [CrossRef]
29. Martin, C.K.; Bhapkar, M.; Pittas, A.G.; Pieper, C.F.; Das, S.K.; Williamson, D.A.; Scott, T.; Redman, L.M.; Stein, R.; Gilhooly, C.H.; et al. Effect of Calorie Restriction on Mood, Quality of Life, Sleep, and Sexual Function in Healthy Nonobese Adults: The CALERIE 2 Randomized Clinical Trial. *JAMA Intern. Med.* **2016**, *176*, 743–752. [CrossRef]
30. Brogi, S.; Tabanelli, R.; Puca, S.; Calderone, V. Intermittent Fasting: Myths, Fakes and Truth on This Dietary Regimen Approach. *Foods* **2024**, *13*, 1960. [CrossRef]
31. Varady, K.A.; Cienfuegos, S.; Ezpeleta, M.; Gabel, K. Clinical Application of Intermittent Fasting for Weight Loss: Progress and Future Directions. *Nat. Rev. Endocrinol.* **2022**, *18*, 309–321. [CrossRef] [PubMed]
32. Trepanowski, J.F.; Kroeger, C.M.; Barnosky, A.; Klempel, M.C.; Bhutani, S.; Hoddy, K.K.; Gabel, K.; Freels, S.; Rigdon, J.; Rood, J.; et al. Effect of Alternate-Day Fasting onWeight Loss, Weight Maintenance, and Cardioprotection Among Metabolically Healthy Obese Adults. *JAMA Intern. Med.* **2017**, *177*, 930–938. [CrossRef]
33. Varady, K.A.; Bhutani, S.; Klempel, M.C.; Kroeger, C.M.; Trepanowski, J.F.; Haus, J.M.; Hoddy, K.K.; Calvo, Y. Alternate Day Fasting for Weight Loss in Normal Weight and Overweight Subjects: A Randomized Controlled Trial. *Nutr. J.* **2013**, *12*, 146. [CrossRef] [PubMed]
34. Ravussin, E.; Redman, L.M.; Rochon, J.; Das, S.K.; Fontana, L.; Kraus, W.E.; Romashkan, S.; Williamson, D.A.; Meydani, S.N.; Villareal, D.T.; et al. A 2-Year Randomized Controlled Trial of Human Caloric Restriction: Feasibility and Effects on Predictors of Health Span and Longevity. *J. Gerontol. A Biol. Sci. Med. Sci.* **2015**, *70*, 1097–1104. [CrossRef]
35. Willoughby, D.; Hewlings, S.; Kalman, D. Body Composition Changes in Weight Loss: Strategies and Supplementation for Maintaining Lean Body Mass, a Brief Review. *Nutrients* **2018**, *10*, 1876. [CrossRef]
36. Heymsfield, S.B.; Cristina Gonzalez, M.C.; Shen, W.; Redman, L.; Thomas, D. Weight Loss Composition Is One-Fourth Fat-Free Mass: A Critical Review and Critique of This Widely Cited Rule. *Obes. Rev.* **2014**, *15*, 310–321. [CrossRef] [PubMed]
37. Pownall, H.J.; Bray, G.A.; Wagenknecht, L.E.; Walkup, M.P.; Heshka, S.; Hubbard, V.S.; Hill, J.; Kahn, S.E.; Nathan, D.M.; Schwartz, A.V.; et al. Changes in Body Composition over Eight Years in a Randomized Trial of a Lifestyle Intervention: The Look AHEAD Study. *Obesity (Silver Spring)* **2015**, *23*, 565–572. [CrossRef]
38. Simeone, T.A.; Simeone, K.A.; Stafstrom, C.E.; Rho, J.M. Do Ketone Bodies Mediate the Anti-Seizure Effects of the Ketogenic Diet? *Neuropharmacology* **2018**, *133*, 233–241. [CrossRef]
39. Key, M.N.; Szabo-Reed, A.N. Impact of Diet and Exercise Interventions on Cognition and Brain Health in Older Adults: A Narrative Review. *Nutrients* **2023**, *15*, 2495. [CrossRef]
40. Lussier, D.M.; Woolf, E.C.; Johnson, J.L.; Brooks, K.S.; Blattman, J.N.; Scheck, A.C. Enhanced Immunity in a Mouse Model of Malignant Glioma Is Mediated by a Therapeutic Ketogenic Diet. *BMC Cancer* **2016**, *16*, 310. [CrossRef]
41. Hirschberger, S.; Strauß, G.; Effinger, D.; Marstaller, X.; Ferstl, A.; Müller, M.B.; Wu, T.; Hübner, M.; Rahmel, T.; Mascolo, H.; et al. Very-low-carbohydrate Diet Enhances Human T-cell Immunity through Immunometabolic Reprogramming. *EMBO Mol. Med.* **2021**, *13*, e14323. [CrossRef]
42. Talib, W.H.; Mahmod, A.I.; Kamal, A.; Rashid, H.M.; Alashqar, A.M.D.; Khater, S.; Jamal, D.; Waly, M. Ketogenic Diet in Cancer Prevention and Therapy: Molecular Targets and Therapeutic Opportunities. *Curr. Issues Mol. Biol.* **2021**, *43*, 558–589. [CrossRef] [PubMed]
43. Heilbronn, L.K.; Smith, S.R.; Martin, C.K.; Anton, S.D.; Ravussin, E. Alternate-Day Fasting in Nonobese Subjects: Effects on Body Weight, Body Composition, and Energy Metabolism. *Am. J. Clin. Nutr.* **2005**, *81*, 69–73. [CrossRef] [PubMed]

44. Tinsley, G.M.; Moore, M.L.; Graybeal, A.J.; Paoli, A.; Kim, Y.; Gonzales, J.U.; Harry, J.R.; VanDusseldorp, T.A.; Kennedy, D.N.; Cruz, M.R. Time-Restricted Feeding plus Resistance Training in Active Females: A Randomized Trial. *Am. J. Clin. Nutr.* **2019**, *110*, 628–640. [CrossRef] [PubMed]
45. Moro, T.; Tinsley, G.; Bianco, A.; Marcolin, G.; Pacelli, Q.F.; Battaglia, G.; Palma, A.; Gentil, P.; Neri, M.; Paoli, A. Effects of Eight Weeks of Time-Restricted Feeding (16/8) on Basal Metabolism, Maximal Strength, Body Composition, Inflammation, and Cardiovascular Risk Factors in Resistance-Trained Males. *J. Transl. Med.* **2016**, *14*, 290. [CrossRef]
46. Selvaraj, S.; Kim, J.; Ansari, B.A.; Zhao, L.; Cvijic, M.E.; Fronheiser, M.; Vanjarapu, J.M.-R.; Kumar, A.A.; Suri, A.; Yenigalla, S.; et al. Body Composition, Natriuretic Peptides, and Adverse Outcomes in Heart Failure with Preserved and Reduced Ejection Fraction. *JACC Cardiovasc. Imaging* **2021**, *14*, 203–215. [CrossRef]
47. Nicklas, B.J.; Brinkley, T.E.; Houston, D.K.; Lyles, M.F.; Hugenschmidt, C.E.; Beavers, K.M.; Leng, X. Effects of Caloric Restriction on Cardiorespiratory Fitness, Fatigue, and Disability Responses to Aerobic Exercise in Older Adults with Obesity: A Randomized Controlled Trial. *J. Gerontol. A Biol. Sci. Med. Sci.* **2019**, *74*, 1084–1090. [CrossRef]
48. Carbone, S.; Billingsley, H.E.; Rodriguez-Miguelez, P.; Kirkman, D.L.; Garten, R.; Lee Franco, R.; Lee, D.; Lavie, C.J. Lean Mass Abnormalities in Heart Failure: The Role of Sarcopenia, Sarcopenic Obesity, and Cachexia. *Curr. Probl. Cardiol.* **2020**, *45*, 100417. [CrossRef]
49. Brubaker, P.H.; Nicklas, B.J.; Houston, D.K.; Hundley, G.; Chen, H.; Molina, M.A.J.A.; Lyles, W.M.; Nelson, B.; Upadhya, B.; Newland, R.; et al. A Randomized, Controlled Trial of Resistance Training Added to Caloric Restriction Plus Aerobic Exercise Training in Obese Heart Failure with Preserved Ejection Fraction. *Circ. Heart Fail.* **2023**, *16*, e010161. [CrossRef]
50. Zhang, L.; Wang, Y.; Sun, Y.; Zhang, X. Intermittent Fasting and Physical Exercise for Preventing Metabolic Disorders through Interaction with Gut Microbiota: A Review. *Nutrients* **2023**, *15*, 2277. [CrossRef]
51. Tinsley, G.M.; Forsse, J.S.; Butler, N.K.; Paoli, A.; Bane, A.A.; La Bounty, P.M.; Morgan, G.B.; Grandjean, P.W. Time-Restricted Feeding in Young Men Performing Resistance Training: A Randomized Controlled Trial. *Eur. J. Sport Sci.* **2017**, *17*, 200–207. [CrossRef]
52. Bhutani, S.; Klempel, M.C.; Kroeger, C.M.; Trepanowski, J.F.; Varady, K.A. Alternate Day Fasting and Endurance Exercise Combine to Reduce Body Weight and Favorably Alter Plasma Lipids in Obese Humans. *Obesity (Silver Spring)* **2013**, *21*, 1370–1379. [CrossRef] [PubMed]
53. Ellison, R.C.; Myers, R.H.; Zhang, Y.; Djoussé, L.; Knox, S.; Williams, R.R.; Province, M.A. Effects of Similarities in Lifestyle Habits on Familial Aggregation of High Density Lipoprotein and Low Density Lipoprotein Cholesterol: The NHLBI Family Heart Study. *Am. J. Epidemiol.* **1999**, *150*, 910–918. [CrossRef] [PubMed]
54. Peven, J.C.; Jakicic, J.M.; Rogers, R.J.; Lesnovskaya, A.; Erickson, K.I.; Kang, C.; Zhou, X.; Porter, A.; Donofry, S.D.; Watt, J.C.; et al. The Effects of a 12-Month Weight Loss Intervention on Cognitive Outcomes in Adults with Overweight and Obesity. *Nutrients* **2020**, *12*, 2988. [CrossRef]
55. Pratchayasakul, W.; Arunsak, B.; Suparan, K.; Sriwichaiin, S.; Chunchai, T.; Chattipakorn, N.; Chattipakorn, S.C. Combined Caloric Restriction and Exercise Provides Greater Metabolic and Neurocognitive Benefits than Either as a Monotherapy in Obesity with or without Estrogen Deprivation. *J. Nutr. Biochem.* **2022**, *110*, 109125. [CrossRef] [PubMed]
56. Thonusin, C.; Pantiya, P.; Kongkaew, A.; Nawara, W.; Arunsak, B.; Sriwichaiin, S.; Chattipakorn, N.; Chattipakorn, S.C. Exercise and Caloric Restriction Exert Different Benefits on Skeletal Muscle Metabolism in Aging Condition. *Nutrients* **2023**, *15*, 5004. [CrossRef]
57. Khalafi, M.; Azali Alamdari, K.; Symonds, M.E.; Rohani, H.; Sakhaei, M.H. A Comparison of the Impact of Exercise Training with Dietary Intervention versus Dietary Intervention Alone on Insulin Resistance and Glucose Regulation in Individual with Overweight or Obesity: A Systemic Review and Meta-Analysis. *Crit. Rev. Food Sci. Nutr.* **2023**, *63*, 9349–9363. [CrossRef]
58. Khalafi, M.; Sakhaei, M.H.; Kazeminasab, F.; Rosenkranz, S.K.; Symonds, M.E. Exercise Training, Dietary Intervention, or Combined Interventions and Their Effects on Lipid Profiles in Adults with Overweight and Obesity: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *Nutr. Metab. Cardiovasc. Dis.* **2023**, *33*, 1662–1683. [CrossRef]
59. Khalafi, M.; Hossein Sakhaei, M.; Kheradmand, S.; Symonds, M.E.; Rosenkranz, S.K. The Impact of Exercise and Dietary Interventions on Circulating Leptin and Adiponectin in Individuals Who Are Overweight and Those with Obesity: A Systematic Review and Meta-Analysis. *Adv. Nutr.* **2022**, *14*, 128–146. [CrossRef]
60. Cheng, C.-C.; Hsu, C.-Y.; Liu, J.-F. Effects of Dietary and Exercise Intervention on Weight Loss and Body Composition in Obese Postmenopausal Women: A Systematic Review and Meta-Analysis. *Menopause* **2018**, *25*, 772–782. [CrossRef]
61. Wu, T.; Gao, X.; Chen, M.; van Dam, R.M. Long-Term Effectiveness of Diet-plus-Exercise Interventions vs. Diet-Only Interventions for Weight Loss: A Meta-Analysis. *Obes. Rev.* **2009**, *10*, 313–323. [CrossRef]
62. Khalafi, M.; Symonds, M.E.; Akbari, A. The Impact of Exercise Training versus Caloric Restriction on Inflammation Markers: A Systemic Review and Meta-Analysis. *Crit. Rev. Food Sci. Nutr.* **2022**, *62*, 4226–4241. [CrossRef] [PubMed]
63. Moher, D.; Liberati, A.; Tetzlaff, J.; Altman, D.G.; PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med.* **2009**, *6*, e1000097. [CrossRef] [PubMed]
64. Farì, G.; Megna, M.; Scacco, S.; Ranieri, M.; Raele, M.V.; Chiaia Noya, E.; Macchiarola, D.; Bianchi, F.P.; Carati, D.; Panico, S.; et al. Hemp Seed Oil in Association with β-Caryophyllene, Myrcene and Ginger Extract as a Nutraceutical Integration in Knee Osteoarthritis: A Double-Blind Prospective Case-Control Study. *Medicina (Kaunas)* **2023**, *59*, 191. [CrossRef] [PubMed]

65. Farì, G.; Santagati, D.; Pignatelli, G.; Scacco, V.; Renna, D.; Cascarano, G.; Vendola, F.; Bianchi, F.P.; Fiore, P.; Ranieri, M.; et al. Collagen Peptides, in Association with Vitamin C, Sodium Hyaluronate, Manganese and Copper, as Part of the Rehabilitation Project in the Treatment of Chronic Low Back Pain. *Endocr. Metab. Immune Disord. Drug Targets* **2022**, *22*, 108–115. [CrossRef]
66. Phillips, N.E.; Mareschal, J.; Schwab, N.; Manoogian, E.N.C.; Borloz, S.; Ostinelli, G.; Gauthier-Jaques, A.; Umwali, S.; Gonzalez Rodriguez, E.; Aeberli, D.; et al. The Effects of Time-Restricted Eating versus Standard Dietary Advice on Weight, Metabolic Health and the Consumption of Processed Food: A Pragmatic Randomised Controlled Trial in Community-Based Adults. *Nutrients* **2021**, *13*, 1042. [CrossRef]
67. Conceição, E.; Orcutt, M.; Mitchell, J.; Engel, S.; LaHaise, K.; Jorgensen, M.; Woodbury, K.; Hass, N.; Garcia, L.; Wonderlich, S. Characterization Of Eating Disorders After Bariatric Surgery: A Case Series Study. *Int. J. Eat. Disord.* **2013**, *46*, 274–279. [CrossRef]
68. Fawcett, E.; Van Velthoven, M.H.; Meinert, E. Long-Term Weight Management Using Wearable Technology in Overweight and Obese Adults: Systematic Review. *JMIR Mhealth Uhealth* **2020**, *8*, e13461. [CrossRef]
69. Przulj, D.; Ladmore, D.; Smith, K.M.; Phillips-Waller, A.; Hajek, P. Time Restricted Eating as a Weight Loss Intervention in Adults with Obesity. *PLoS ONE* **2021**, *16*, e0246186. [CrossRef]
70. Vidmar, A.P.; Naguib, M.; Raymond, J.K.; Salvy, S.J.; Hegedus, E.; Wee, C.P.; Goran, M.I. Time-Limited Eating and Continuous Glucose Monitoring in Adolescents with Obesity: A Pilot Study. *Nutrients* **2021**, *13*, 3697. [CrossRef]
71. Ross, R.; Janiszewski, P.M. Is Weight Loss the Optimal Target for Obesity-Related Cardiovascular Disease Risk Reduction? *Can. J. Cardiol.* **2008**, *24*, 25D–31D. [CrossRef] [PubMed]
72. Davidson, L.E.; Hunt, S.C.; Adams, T.D. Fitness versus Adiposity in Cardiovascular Disease Risk. *Eur. J. Clin. Nutr.* **2019**, *73*, 225–230. [CrossRef] [PubMed]
73. Eglseer, D.; Traxler, M.; Embacher, S.; Reiter, L.; Schoufour, J.D.; Weijs, P.J.M.; Voortman, T.; Boirie, Y.; Cruz-Jentoft, A.; Bauer, S. Nutrition and Exercise Interventions to Improve Body Composition for Persons with Overweight or Obesity Near Retirement Age: A Systematic Review and Network Meta-Analysis of Randomized Controlled Trials. *Adv. Nutr.* **2023**, *14*, 516–538. [CrossRef] [PubMed]
74. Ahmad, Y.; Seo, D.S.; Jang, Y. Metabolic Effects of Ketogenic Diets: Exploring Whole-Body Metabolism in Connection with Adipose Tissue and Other Metabolic Organs. *Int. J. Mol. Sci.* **2024**, *25*, 7076. [CrossRef]
75. Kuchkuntla, A.R.; Shah, M.; Velapati, S.; Gershuni, V.M.; Rajjo, T.; Nanda, S.; Hurt, R.T.; Mundi, M.S. Ketogenic Diet: An Endocrinologist Perspective. *Curr. Nutr. Rep.* **2019**, *8*, 402–410. [CrossRef]
76. Weber, D.D.; Aminzadeh-Gohari, S.; Tulipan, J.; Catalano, L.; Feichtinger, R.G.; Kofler, B. Ketogenic Diet in the Treatment of Cancer—Where Do We Stand? *Mol. Metab.* **2019**, *33*, 102–121. [CrossRef]
77. Qiu, H.; Kan, C.; Han, F.; Luo, Y.; Qu, N.; Zhang, K.; Ma, Y.; Hou, N.; Wu, D.; Sun, X.; et al. Metagenomic and Metabolomic Analysis Showing the Adverse Risk-Benefit Trade-off of the Ketogenic Diet. *Lipids Health Dis.* **2024**, *23*, 207. [CrossRef]
78. Virto, N.; Río, X.; Méndez-Zorrilla, A.; García-Zapirain, B. Non Invasive Techniques for Direct Muscle Quality Assessment after Exercise Intervention in Older Adults: A Systematic Review. *BMC Geriatr.* **2024**, *24*, 642. [CrossRef]
79. Sandireddy, R.; Sakthivel, S.; Gupta, P.; Behari, J.; Tripathi, M.; Singh, B.K. Systemic Impacts of Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) and Metabolic Dysfunction-Associated Steatohepatitis (MASH) on Heart, Muscle, and Kidney Related Diseases. *Front. Cell Dev. Biol.* **2024**, *12*, 1433857. [CrossRef]
80. Furrer, R.; Handschin, C. Molecular Aspects of the Exercise Response and Training Adaptation in Skeletal Muscle. *Free Radic. Biol. Med.* **2024**, *223*, 53–68. [CrossRef]
81. Genton, L.; Karsegard, V.L.; Chevalley, T.; Kossovsky, M.P.; Darmon, P.; Pichard, C. Body Composition Changes over 9 Years in Healthy Elderly Subjects and Impact of Physical Activity. *Clin. Nutr.* **2011**, *30*, 436–442. [CrossRef]
82. Moradell, A.; Gomez-Cabello, A.; Mañas, A.; Gesteiro, E.; Pérez-Gómez, J.; González-Gross, M.; Casajús, J.A.; Ara, I.; Vicente-Rodríguez, G. Longitudinal Changes in the Body Composition of Non-Institutionalized Spanish Older Adults after 8 Years of Follow-Up: The Effects of Sex, Age, and Organized Physical Activity. *Nutrients* **2024**, *16*, 298. [CrossRef] [PubMed]
83. Paoli, A.; Bianco, A.; Grimaldi, K.A. The Ketogenic Diet and Sport: A Possible Marriage? *Exerc. Sport Sci. Rev.* **2015**, *43*, 153–162. [CrossRef]
84. Phinney, S.D. Ketogenic Diets and Physical Performance. *Nutr. Metab.* **2004**, *1*, 2. [CrossRef] [PubMed]
85. Fernández-Elías, V.E.; Ortega, J.F.; Nelson, R.K.; Mora-Rodriguez, R. Relationship between Muscle Water and Glycogen Recovery after Prolonged Exercise in the Heat in Humans. *Eur. J. Appl. Physiol.* **2015**, *115*, 1919–1926. [CrossRef] [PubMed]
86. Manolis, A.S.; Manolis, T.A.; Manolis, A.A.; Melita, H. Diet and Sudden Death: How to Reduce the Risk. *Curr. Vasc. Pharmacol.* **2022**, *20*, 383–408. [CrossRef]
87. Kenig, S.; Petelin, A.; Poklar Vatovec, T.; Mohorko, N.; Jenko-Pražnikar, Z. Assessment of Micronutrients in a 12-Wk Ketogenic Diet in Obese Adults. *Nutrition* **2019**, *67–68*, 110522. [CrossRef]
88. Burén, J.; Svensson, M.; Liv, P.; Sjödin, A. Effects of a Ketogenic Diet on Body Composition in Healthy, Young, Normal-Weight Women: A Randomized Controlled Feeding Trial. *Nutrients* **2024**, *16*, 2030. [CrossRef]
89. Noakes, M.; Foster, P.R.; Keogh, J.B.; James, A.P.; Mamo, J.C.; Clifton, P.M. Comparison of Isocaloric Very Low Carbohydrate/High Saturated Fat and High Carbohydrate/Low Saturated Fat Diets on Body Composition and Cardiovascular Risk. *Nutr. Metab.* **2006**, *3*, 7. [CrossRef]
90. Brehm, B.J.; Spang, S.E.; Lattin, B.L.; Seeley, R.J.; Daniels, S.R.; D'Alessio, D.A. The Role of Energy Expenditure in the Differential Weight Loss in Obese Women on Low-Fat and Low-Carbohydrate Diets. *J. Clin. Endocrinol. Metab.* **2005**, *90*, 1475–1482. [CrossRef]

91. Tinsley, G.M.; Willoughby, D.S. Fat-Free Mass Changes During Ketogenic Diets and the Potential Role of Resistance Training. *Int. J. Sport Nutr. Exerc. Metab.* **2016**, *26*, 78–92. [CrossRef] [PubMed]
92. Ashtary-Larky, D.; Bagheri, R.; Asbaghi, O.; Tinsley, G.M.; Kooti, W.; Abbasnezhad, A.; Afrisham, R.; Wong, A. Effects of Resistance Training Combined with a Ketogenic Diet on Body Composition: A Systematic Review and Meta-Analysis. *Crit. Rev. Food Sci. Nutr.* **2022**, *62*, 5717–5732. [CrossRef]
93. Thomson, D.M. The Role of AMPK in the Regulation of Skeletal Muscle Size, Hypertrophy, and Regeneration. *Int. J. Mol. Sci.* **2018**, *19*, 3125. [CrossRef] [PubMed]
94. Wei, S.-J.; Schell, J.R.; Chocron, E.S.; Varmazyad, M.; Xu, G.; Chen, W.H.; Martinez, G.M.; Dong, F.F.; Sreenivas, P.; Trevino, R.; et al. Ketogenic Diet Induces P53-Dependent Cellular Senescence in Multiple Organs. *Sci. Adv.* **2024**, *10*, eado1463. [CrossRef] [PubMed]
95. Andersen, R.E.; Wadden, T.A.; Herzog, R.J. Changes in Bone Mineral Content in Obese Dieting Women. *Metabolism* **1997**, *46*, 857–861. [CrossRef]
96. Andreou, E.; Philippou, C.; Papandreou, D. Effects of an Intervention and Maintenance Weight Loss Diet with and without Exercise on Anthropometric Indices in Overweight and Obese Healthy Women. *Ann. Nutr. Metab.* **2011**, *59*, 187–192. [CrossRef]
97. Apekey, T.A.; Morris, A.E.J.; Fagbemi, S.; Griffiths, G.J. Benefits of Moderate-Intensity Exercise during a Calorie-Restricted Low-Fat Diet. *Health Educ. J.* **2012**, *71*, 154–164. [CrossRef]
98. Brinkley, T.E.; Wang, X.; Kume, N.; Mitsuoka, H.; Nicklas, B.J. Caloric Restriction, Aerobic Exercise Training and Soluble Lectin-like Oxidized LDL Receptor-1 Levels in Overweight and Obese Post-Menopausal Women. *Int. J. Obes.* **2011**, *35*, 793–799. [CrossRef]
99. Brochu, M.; Malita, M.F.; Messier, V.; Doucet, E.; Strychar, I.; Lavoie, J.M.; Prud'homme, D.; Rabasa-Lhoret, R. Resistance Training Does Not Contribute to Improving the Metabolic Profile after a 6-Month Weight Loss Program in Overweight and Obese Postmenopausal Women. *J. Clin. Endocrinol. Metab.* **2009**, *94*, 3226–3233. [CrossRef]
100. Campbell, K.L.; Foster-Schubert, K.E.; Alfano, C.M.; Wang, C.-C.; Wang, C.-Y.; Duggan, C.R.; Mason, C.; Imayama, I.; Kong, A.; Xiao, L.; et al. Reduced-Calorie Dietary Weight Loss, Exercise, and Sex Hormones in Postmenopausal Women: Randomized Controlled Trial. *J. Clin. Oncol.* **2012**, *30*, 2314–2326. [CrossRef]
101. Cho, A.R.; Moon, J.Y.; Kim, S.; An, K.Y.; Oh, M.; Jeon, J.Y.; Jung, D.H.; Choi, M.H.; Lee, J.W. Effects of Alternate Day Fasting and Exercise on Cholesterol Metabolism in Overweight or Obese Adults: A Pilot Randomized Controlled Trial. *Metab. Clin. Exp.* **2019**, *93*, 52–60. [CrossRef] [PubMed]
102. Christiansen, T.; Paulsen, S.K.; Bruun, J.M.; Ploug, T.; Pedersen, S.B.; Richelsen, B. Diet-Induced Weight Loss and Exercise Alone and in Combination Enhance the Expression of Adiponectin Receptors in Adipose Tissue and Skeletal Muscle, but Only Diet-Induced Weight Loss Enhanced Circulating Adiponectin. *J. Clin. Endocrinol. Metab.* **2010**, *95*, 911–919. [CrossRef]
103. Civitarese, A.E.; Carling, S.; Heilbronn, L.K.; Hulver, M.H.; Ukropcova, B.; Deutsch, W.A.; Smith, S.R.; Ravussin, E. Calorie Restriction Increases Muscle Mitochondrial Biogenesis in Healthy Humans. *PLoS Med.* **2007**, *4*, e76. [CrossRef] [PubMed]
104. Cooke, M.B.; Deasy, W.; Ritenis, E.J.; Wilson, R.A.; Stathis, C.G. Effects of Intermittent Energy Restriction Alone and in Combination with Sprint Interval Training on Body Composition and Cardiometabolic Biomarkers in Individuals with Overweight and Obesity. *Int. J. Environ. Res. Public Health* **2022**, *19*, 7969. [CrossRef]
105. Cooper, J.N.; Columbus, M.L.; Shields, K.J.; Asubonteng, J.; Meyer, M.L.; Sutton-Tyrrell, K.; Goodpaster, B.H.; DeLany, J.P.; Jakicic, J.M.; Barinas-Mitchell, E. Effects of an Intensive Behavioral Weight Loss Intervention Consisting of Caloric Restriction with or without Physical Activity on Common Carotid Artery Remodeling in Severely Obese Adults. *Metab. Clin. Exp.* **2012**, *61*, 1589–1597. [CrossRef]
106. Correia, J.M.; Santos, P.D.G.; Pezarat-Correia, P.; Minderico, C.S.; Infante, J.; Mendonca, G.V. Effect of Time-Restricted Eating and Resistance Training on High-Speed Strength and Body Composition. *Nutrients* **2023**, *15*, 285. [CrossRef] [PubMed]
107. Cox, K.L.; Burke, V.; Morton, A.R.; Beilin, L.J.; Puddey, I.B. The Independent and Combined Effects of 16 Weeks of Vigorous Exercise and Energy Restriction on Body Mass and Composition in Free-Living Overweight Men—A Randomized Controlled Trial. *Metab.-Clin. Exp.* **2003**, *52*, 107–115. [CrossRef]
108. Del Corral, P.; Chandler-Laney, P.C.; Casazza, K.; Gower, B.A.; Hunter, G.R. Effect of Dietary Adherence with or without Exercise on Weight Loss: A Mechanistic Approach to a Global Problem. *J. Clin. Endocrinol. Metab.* **2009**, *94*, 1602–1607. [CrossRef]
109. Duggan, C.; De Dieu Tapsoba, J.; Shivappa, N.; Harris, H.R.; Hébert, J.R.; Wang, C.Y.; McTiernan, A. Changes in Dietary Inflammatory Index Patterns with Weight Loss in Women: A Randomized Controlled Trial. *Cancer Prev. Res.* **2021**, *14*, 85–94. [CrossRef]
110. Fontana, L.; Villareal, D.T.; Weiss, E.P.; Racette, S.B.; Steger-May, K.; Klein, S.; Holloszy, J.O. Calorie Restriction or Exercise: Effects on Coronary Heart Disease Risk Factors. A Randomized, Controlled Trial. *Am. J. Physiol. Endocrinol. Metab.* **2007**, *293*, E197–E202. [CrossRef]
111. Foster-Schubert, K.E.; Alfano, C.M.; Duggan, C.R.; Xiao, L.; Campbell, K.L.; Kong, A.; Bain, C.E.; Wang, C.Y.; Blackburn, G.L.; McTiernan, A. Effect of Diet and Exercise, Alone or Combined, on Weight and Body Composition in Overweight-to-Obese Postmenopausal Women. *Obesity* **2012**, *20*, 1628–1638. [CrossRef]
112. Galedari, M.; Azarbayjani, M.A.; Peeri, M. Effects of Type of Exercise along with Caloric Restriction on Plasma Apelin 36 and HOMA-IR in Overweight Men. *Sci. Sports* **2017**, *32*, e137–e145. [CrossRef]

113. García-Unciti, M.; Izquierdo, M.; Idoate, F.; Gorostiaga, E.; Grijalba, A.; Ortega-Delgado, F.; Martínez-Labari, C.; Moreno-Navarrete, J.M.; Forga, L.; Fernández-Real, J.M.; et al. Weight-Loss Diet Alone or Combined with Progressive Resistance Training Induces Changes in Association between the Cardiometabolic Risk Profile and Abdominal Fat Depots. *Ann. Nutr. Metab.* **2012**, *61*, 296–304. [CrossRef]
114. Geliebter, A.; Maher, M.M.; Gerace, L.; Gutin, B.; Heymsfield, S.B.; Hashim, S.A. Effects of Strength or Aerobic Training on Body Composition, Resting Metabolic Rate, and Peak Oxygen Consumption in Obese Dieting Subjects. *Am. J. Clin. Nutr.* **1997**, *66*, 557–563. [CrossRef] [PubMed]
115. Geliebter, A.; Ochner, C.N.; Dambkowski, C.L.; Hashim, S.A. Obesity-Related Hormones and Metabolic Risk Factors: A Randomized Trial of Diet plus Either Strength or Aerobic Training versus Diet Alone in Overweight Participants. *J. Diabetes Obes.* **2014**, *1*, 1–7. [PubMed]
116. Glud, M.; Christiansen, T.; Larsen, L.H.; Richelsen, B.; Bruun, J.M. Changes in Circulating BDNF in Relation to Sex, Diet, and Exercise: A 12-Week Randomized Controlled Study in Overweight and Obese Participants. *J. Obes.* **2019**, *2019*, 4537274. [CrossRef] [PubMed]
117. Goodpaster, B.H.; DeLany, J.P.; Otto, A.D.; Kuller, L.; Vockley, J.; South-Paul, J.E.; Thomas, S.B.; Brown, J.; McTigue, K.; Hames, K.C.; et al. Effects of Diet and Physical Activity Interventions on Weight Loss and Cardiometabolic Risk Factors in Severely Obese Adults A Randomized Trial. *JAMA-J. Am. Med. Assoc.* **2010**, *304*, 1795–1802. [CrossRef] [PubMed]
118. Gregory, R.M. A Low-Carbohydrate Ketogenic Diet Combined with 6-Weeks of Crossfit Training Improves Body Composition and Performance. *Int. J. Sports Exerc. Med.* **2017**, *3*, 054. [CrossRef]
119. Gutierrez-Lopez, L.; Garcia-Sanchez, J.R.; Rincon-Viquez Mde, J.; Lara-Padilla, E.; Sierra-Vargas, M.P.; Olivares-Corichi, I.M. Hypocaloric Diet and Regular Moderate Aerobic Exercise Is an Effective Strategy to Reduce Anthropometric Parameters and Oxidative Stress in Obese Patients. *Obes. Facts* **2012**, *5*, 12–22. [CrossRef]
120. Hadizadeh, M.; Gan, W.Y.; Mohafez, H.; Sugajima, Y. Impact of Ketogenic Diet on Body Composition during Resistance Training among Untrained Individuals. *Open Sports Sci. J.* **2020**, *13*, 114–119. [CrossRef]
121. Haganes, K.L.; Silva, C.P.; Eyjolfsdottir, S.K.; Steen, S.; Grindberg, M.; Lydersen, S.; Hawley, J.A.; Moholdt, T. Time-Restricted Eating and Exercise Training Improve HbA1c and Body Composition in Women with Overweight/Obesity: A Randomized Controlled Trial. *Cell Metab.* **2022**, *34*, 1457–1471. [CrossRef] [PubMed]
122. Hosny, I.A.; Elghawabi, H.S.; Younan, W.B.; Sabbour, A.A.; Gobrial, M.A. Beneficial Impact of Aerobic Exercises on Bone Mineral Density in Obese Premenopausal Women under Caloric Restriction. *Skelet. Radiol.* **2012**, *41*, 423–427. [CrossRef] [PubMed]
123. Ibáñez, J.; Izquierdo, M.; Martínez-Labari, C.; Ortega, F.; Grijalba, A.; Forga, L.; Idoate, F.; García-Unciti, M.; Fernández-Real, J.M.; Gorostiaga, E.M. Resistance Training Improves Cardiovascular Risk Factors in Obese Women Despite a Significative Decrease in Serum Adiponectin Levels. *Obesity* **2010**, *18*, 535–541. [CrossRef]
124. Isenmann, E.; Dissemond, J.; Geisler, S. The Effects of a Macronutrient-Based Diet and Time-Restricted Feeding (16:8) on Body Composition in Physically Active Individuals-A 14-Week Randomised Controlled Trial. *Nutrients* **2021**, *13*, 3122. [CrossRef] [PubMed]
125. Jo, E.; Worts, P.R.; Elam, M.L.; Brown, A.F.; Khamoui, A.V.; Kim, D.H.; Yeh, M.C.; Ormsbee, M.J.; Prado, C.M.; Cain, A.; et al. Resistance Training during a 12-Week Protein Supplemented VLCD Treatment Enhances Weight-Loss Outcomes in Obese Patients. *Clin. Nutr.* **2019**, *38*, 372–382. [CrossRef]
126. Keawtep, P.; Sungkarat, S.; Boripuntakul, S.; Sa-nguanmoo, P.; Wichayanrat, W.; Chattipakorn, S.C.; Worakul, P. Effects of Combined Dietary Intervention and Physical-Cognitive Exercise on Cognitive Function and Cardiometabolic Health of Post-menopausal Women with Obesity: A Randomized Controlled Trial. *Int. J. Behav. Nutr. Phys. Act.* **2024**, *21*, 28. [CrossRef] [PubMed]
127. Keenan, S.; Cooke, M.B.; Chen, W.S.; Wu, S.; Belski, R. The Effects of Intermittent Fasting and Continuous Energy Restriction with Exercise on Cardiometabolic Biomarkers, Dietary Compliance, and Perceived Hunger and Mood: Secondary Outcomes of a Randomised, Controlled Trial. *Nutrients* **2022**, *14*, 3071. [CrossRef] [PubMed]
128. Kerksick, C.M.; Roberts, M.D.; Campbell, B.I.; Galbreath, M.M.; Taylor, L.W.; Wilborn, C.D.; Lee, A.; Dove, J.; Bunn, J.W.; Rasmussen, C.J.; et al. Differential Impact of Calcium and Vitamin D on Body Composition Changes in Post-Menopausal Women Following a Restricted Energy Diet and Exercise Program. *Nutrients* **2020**, *12*, 713. [CrossRef]
129. Kirkwood, L.; Aldujaili, E.; Drummond, S. Effects of Advice on Dietary Intake and/or Physical Activity on Body Composition, Blood Lipids and Insulin Resistance Following a Low-Fat, Sucrose-Containing, High-Carbohydrate, Energy-Restricted Diet. *Int. J. Food Sci. Nutr.* **2007**, *58*, 383–397. [CrossRef]
130. Kotarsky, C.J.; Johnson, N.R.; Mahoney, S.J.; Mitchell, S.L.; Schimek, R.L.; Stastny, S.N.; Hackney, K.J. Time-Restricted Eating and Concurrent Exercise Training Reduces Fat Mass and Increases Lean Mass in Overweight and Obese Adults. *Physiol. Rep.* **2021**, *9*, e14868. [CrossRef]
131. Larson-Meyer, D.E.; Newcomer, B.R.; Heilbronn, L.K.; Volaufova, J.; Smith, S.R.; Alfonso, A.J.; Lefevre, M.; Rood, J.C.; Williamson, D.A.; Ravussin, E. Effect of 6-Month Calorie Restriction and Exercise on Serum and Liver Lipids and Markers of Liver Function. *Obesity* **2008**, *16*, 1355–1362. [CrossRef] [PubMed]
132. Liu, H.T.; Chen, S.Y.; Ji, H.Y.; Dai, Z.Q. Effects of Time-Restricted Feeding and Walking Exercise on the Physical Health of Female College Students with Hidden Obesity: A Randomized Trial. *Front. Public Health* **2023**, *11*, 1020887. [CrossRef]

133. Maaloul, R.; Marzougui, H.; Ben Dhia, I.; Ghroubi, S.; Tagougui, S.; Kallel, C.; Driss, T.; Elleuch, M.H.; Ayadi, F.; Turki, M.; et al. Effectiveness of Ramadan Diurnal Intermittent Fasting and Concurrent Training in the Management of Obesity: Is the Combination Worth the Weight? *Nutr. Metab. Cardiovasc. Dis.* **2023**, *33*, 659–666. [CrossRef] [PubMed]
134. Marks, B.L.; Ward, A.; Morris, D.H.; Castellani, J.; Rippe, J.M. Fat-free mass is maintained in women following a moderate diet and exercise program. *Med. Sci. Sports Exerc.* **1995**, *27*, 1243–1251. [CrossRef]
135. Martin, C.K.; Heilbronn, L.K.; de Jonge, L.; DeLany, J.P.; Volaufova, J.; Anton, S.D.; Redman, L.M.; Smith, S.R.; Ravussin, E. Effect of Calorie Restriction on Resting Metabolic Rate and Spontaneous Physical Activity. *Obesity* **2007**, *15*, 2964–2973. [CrossRef]
136. Martínez-Rodríguez, A.; Rubio-Arias, J.A.; García-De Frutos, J.M.; Vicente-Martínez, M.; Gunnarsson, T.P. Effect of High-Intensity Interval Training and Intermittent Fasting on Body Composition and Physical Performance in Active Women. *Int. J. Environ. Res. Public Health* **2021**, *18*, 6431. [CrossRef]
137. McNeil, J.; Schwartz, A.; Rabasa-Lhoret, R.; Lavoie, J.M.; Brochu, M.; Doucet, É. Changes in Leptin and Peptide YY Do Not Explain the Greater-Than-Predicted Decreases in Resting Energy Expenditure After Weight Loss. *J. Clin. Endocrinol. Metab.* **2015**, *100*, E443–E452. [CrossRef] [PubMed]
138. Meckling, K.A.; Sherfey, R. A Randomized Trial of a Hypocaloric High-Protein Diet, with and without Exercise, on Weight Loss, Fitness, and Markers of the Metabolic Syndrome in Overweight and Obese Women. *Appl. Physiol. Nutr. Metab.* **2007**, *32*, 743–752. [CrossRef]
139. Mediano, M.F.; Barbosa, J.S.; Moura, A.S.; Willett, W.C.; Sichieri, R. A Randomized Clinical Trial of Home-Based Exercise Combined with a Slight Caloric Restriction on Obesity Prevention among Women. *Prev. Med.* **2010**, *51*, 247–252. [CrossRef]
140. Messier, V.; Rabasa-Lhoret, R.; Doucet, E.; Brochu, M.; Lavoie, J.M.; Karelis, A.; Prud'homme, D.; Strychar, I. Effects of the Addition of a Resistance Training Programme to a Caloric Restriction Weight Loss Intervention on Psychosocial Factors in Overweight and Obese Post-Menopausal Women: A Montreal Ottawa New Emerging Team Study. *J. Sports Sci.* **2010**, *28*, 83–92. [CrossRef]
141. Miller, T.; Mull, S.; Aragon, A.A.; Krieger, J.; Schoenfeld, B.J. Resistance Training Combined with Diet Decreases Body Fat While Preserving Lean Mass Independent of Resting Metabolic Rate: A Randomized Trial. *Int. J. Sport Nutr. Exerc. Metab.* **2018**, *28*, 46–54. [CrossRef]
142. Moreno, B.; Bellido, D.; Sajoux, I.; Goday, A.; Saavedra, D.; Crujeiras, A.B.; Casanueva, F.F. Comparison of a Very Low-Calorie-Ketogenic Diet with a Standard Low-Calorie Diet in the Treatment of Obesity. *Endocrine* **2014**, *47*, 793–805. [CrossRef] [PubMed]
143. Moro, T.; Tinsley, G.; Pacelli, F.Q.; Marcolin, G.; Bianco, A.; Paoli, A. Twelve Months of Time-Restricted Eating and Resistance Training Improves Inflammatory Markers and Cardiometabolic Risk Factors. *Med. Sci. Sports Exerc.* **2021**, *53*, 2577–2585. [CrossRef]
144. Murakami, T.; Horigome, H.; Tanaka, K.; Nakata, Y.; Katayama, Y.; Matsui, A. Effects of Diet with or without Exercise on Leptin and Anticoagulation Proteins Levels in Obesity. *Blood Coagul. Fibrinolysis* **2007**, *18*, 389–394. [CrossRef] [PubMed]
145. Nakata, Y.; Ohkawara, K.; Lee, D.J.; Okura, T.; Tanaka, K. Effects of Additional Resistance Training during Diet-Induced Weight Loss on Bone Mineral Density in Overweight Premenopausal Women. *J. Bone Miner. Metab.* **2008**, *26*, 172–177. [CrossRef] [PubMed]
146. Nicklas, B.J.; Wang, X.W.; You, T.J.; Lyles, M.F.; Demons, J.; Easter, L.; Berry, M.J.; Lenchik, L.; Carr, J.J. Effect of Exercise Intensity on Abdominal Fat Loss during Calorie Restriction in Overweight and Obese Postmenopausal Women: A Randomized, Controlled Trial. *Am. J. Clin. Nutr.* **2009**, *89*, 1043–1052. [CrossRef]
147. Nieman, D.C.; Nehlsen-Cannarella, S.L.; Henson, D.A.; Koch, A.J.; Butterworth, D.E.; Fagoaga, O.R.; Utter, A. Immune Response to Exercise Training and/or Energy Restriction in Obese Women. *Med. Sci. Sports Exerc.* **1998**, *30*, 679–686. [CrossRef]
148. Paoli, A.; Cenci, L.; Pompei, P.; Sahin, N.; Bianco, A.; Neri, M.; Caprio, M.; Moro, T. Effects of Two Months of Very Low Carbohydrate Ketogenic Diet on Body Composition, Muscle Strength, Muscle Area, and Blood Parameters in Competitive Natural Body Builders. *Nutrients* **2021**, *13*, 374. [CrossRef]
149. Piacenza, F.; Malavolta, M.; Basso, A.; Costarelli, L.; Giacconi, R.; Ravussin, E.; Redman, L.M.; Mocchegiani, E. Effect of 6-Month Caloric Restriction on Cu Bound to Ceruloplasmin in Adult Overweight Subjects. *J. Nutr. Biochem.* **2015**, *26*, 876–882. [CrossRef]
150. Pureza, I.; Melo, I.S.V.; Macena, M.L.; Praxedes, D.R.S.; Vasconcelos, L.G.L.; Silva, A.E.; Florêncio, T.; Bueno, N.B. Acute Effects of Time-Restricted Feeding in Low-Income Women with Obesity Placed on Hypoenergetic Diets: Randomized Trial. *Nutrition* **2020**, *77*, 110796. [CrossRef]
151. Rhyu, H.-S.; Cho, S.-Y. The Effect of Weight Loss by Ketogenic Diet on the Body Composition, Performance-Related Physical Fitness Factors and Cytokines of Taekwondo Athletes. *J. Exerc. Rehabil.* **2014**, *10*, 326–331. [CrossRef]
152. Richardson, C.E.; Tovar, A.P.; Davis, B.A.; Van Loan, M.D.; Keim, N.L.; Casazza, G.A. An Intervention of Four Weeks of Time-Restricted Eating (16/8) in Male Long-Distance Runners Does Not Affect Cardiometabolic Risk Factors. *Nutrients* **2023**, *15*, 985. [CrossRef] [PubMed]
153. Ryan, A.S.; Nicklas, B.J.; Dennis, K.E. Aerobic Exercise Maintains Regional Bone Mineral Density during Weight Loss in Postmenopausal Women. *J. Appl. Physiol.* **1998**, *84*, 1305–1310. [CrossRef]
154. Sénéchal, M.; Bouchard, D.R.; Dionne, I.J.; Brochu, M. The Effects of Lifestyle Interventions in Dynapenic-Obese Postmenopausal Women. *Menopause* **2012**, *19*, 1015–1021. [CrossRef] [PubMed]
155. Serra, M.C.; Ryan, A.S. Bone Mineral Density Changes during Weight Regain Following Weight Loss with and without Exercise. *Nutrients* **2021**, *13*, 2848. [CrossRef] [PubMed]

156. Silverman, N.E.; Nicklas, B.J.; Ryan, A.S. Addition of Aerobic Exercise to a Weight Loss Program Increases BMD, with an Associated Reduction in Inflammation in Overweight Postmenopausal Women. *Calcif. Tissue Int.* **2009**, *84*, 257–265. [CrossRef]
157. Solomon, T.P.; Haus, J.M.; Marchetti, C.M.; Stanley, W.C.; Kirwan, J.P. Effects of Exercise Training and Diet on Lipid Kinetics during Free Fatty Acid-Induced Insulin Resistance in Older Obese Humans with Impaired Glucose Tolerance. *Am. J. Physiol. Endocrinol. Metab.* **2009**, *297*, E552–E559. [CrossRef] [PubMed]
158. St-Onge, M.; Rabasa-Lhoret, R.; Strychar, I.; Faraj, M.; Doucet, É.; Lavoie, J.M. Impact of Energy Restriction with or without Resistance Training on Energy Metabolism in Overweight and Obese Postmenopausal Women: A Montreal Ottawa New Emerging Team Group Study. *Menopause* **2013**, *20*, 194–201. [CrossRef]
159. Tang, Z.; Ming, Y.; Wu, M.; Jing, J.; Xu, S.; Li, H.; Zhu, Y. Effects of Caloric Restriction and Rope-Skipping Exercise on Cardiometabolic Health: A Pilot Randomized Controlled Trial in Young Adults. *Nutrients* **2021**, *13*, 3222. [CrossRef]
160. Tovar, A.P.; Richardson, C.E.; Keim, N.L.; Van Loan, M.D.; Davis, B.A.; Casazza, G.A. Four Weeks of 16/8 Time Restrictive Feeding in Endurance Trained Male Runners Decreases Fat Mass, without Affecting Exercise Performance. *Nutrients* **2021**, *13*, 2941. [CrossRef]
161. Utter, A.C.; Nieman, D.C.; Shannonhouse, E.M.; Butterworth, D.E.; Nieman, C.N. Influence of Diet and/or Exercise on Body Composition and Cardiorespiratory Fitness in Obese Women. *Int. J. Sport Nutr.* **1998**, *8*, 213–222. [CrossRef]
162. Valsdottir, T.D.; Ovrebo, B.; Falck, T.M.; Litleskare, S.; Johansen, E.I.; Henriksen, C.; Jensen, J. Low-Carbohydrate High-Fat Diet and Exercise: Effect of a 10-Week Intervention on Body Composition and CVD Risk Factors in Overweight and Obese Women-A Randomized Controlled Trial. *Nutrients* **2021**, *13*, 110. [CrossRef] [PubMed]
163. Vargas-Molina, S.; Petro, J.L.; Romance, R.; Kreider, R.B.; Schoenfeld, B.J.; Bonilla, D.A.; Benítez-Porres, J. Effects of a Ketogenic Diet on Body Composition and Strength in Trained Women. *J. Int. Soc. Sports Nutr.* **2020**, *17*, 19. [CrossRef]
164. Vidić, V.; Ilić, V.; Toskić, L.; Janković, N.; Ugarković, D. Effects of Calorie Restricted Low Carbohydrate High Fat Ketogenic vs. Non-Ketogenic Diet on Strength, Body-Composition, Hormonal and Lipid Profile in Trained Middle-Aged Men. *Clin. Nutr.* **2021**, *40*, 1495–1502. [CrossRef] [PubMed]
165. Wang, X.; Lyles, M.F.; You, T.; Berry, M.J.; Rejeski, W.J.; Nicklas, B.J. Weight Regain Is Related to Decreases in Physical Activity during Weight Loss. *Med. Sci. Sports Exerc.* **2008**, *40*, 1781–1788. [CrossRef]
166. Wang, X.W.; You, T.J.; Murphy, K.; Lyles, M.F.; Nicklas, B.J. Addition of Exercise Increases Plasma Adiponectin and Release from Adipose Tissue. *Med. Sci. Sports Exerc.* **2015**, *47*, 2450–2455. [CrossRef] [PubMed]
167. Weiss, E.P.; Jordan, R.C.; Frese, E.M.; Albert, S.G.; Villareal, D.T. Effects of Weight Loss on Lean Mass, Strength, Bone, and Aerobic Capacity. *Med. Sci. Sports Exerc.* **2017**, *49*, 206–217. [CrossRef]
168. Wilson, J.M.; Lowery, R.P.; Roberts, M.D.; Sharp, M.H.; Joy, J.M.; Shields, K.A.; Partl, J.M.; Volek, J.S.; D'Agostino, D.P. Effects of Ketogenic Dieting on Body Composition, Strength, Power, and Hormonal Profiles in Resistance Training Men. *J. Strength Cond. Res.* **2020**, *34*, 3463–3474. [CrossRef]
169. Yoshimura, E.; Kumahara, H.; Tobina, T.; Matsuda, T.; Ayabe, M.; Kiyonaga, A.; Anzai, K.; Higaki, Y.; Tanaka, H. Lifestyle Intervention Involving Calorie Restriction with or without Aerobic Exercise Training Improves Liver Fat in Adults with Visceral Adiposity. *J. Obes.* **2014**, *2014*, 197216. [CrossRef]
170. You, T.; Disanzo, B.L.; Wang, X.; Yang, R.; Gong, D. Adipose Tissue Endocannabinoid System Gene Expression: Depot Differences and Effects of Diet and Exercise. *Lipids Health Dis.* **2011**, *10*, 1–8. [CrossRef] [PubMed]
171. Zajac, A.; Poprzecki, S.; Maszczyk, A.; Czuba, M.; Michalczyk, M.; Zydek, G. The Effects of a Ketogenic Diet on Exercise Metabolism and Physical Performance in Off-Road Cyclists. *Nutrients* **2014**, *6*, 2493–2508. [CrossRef] [PubMed]
172. Zhao, X.G.; Huang, H.M.; Du, C.Y. Effect of a Combination of Aerobic Exercise and Dietary Modification on Liver Function in Overweight and Obese Men. *J. Men's Health* **2021**, *17*, 176–182. [CrossRef]
173. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, M.J.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ* **2021**, *372*, n71. [CrossRef] [PubMed]