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ORIGINAL RESEARCH

Exercise Individually or as a Collective Family Activity? A Semi-Experimental Comparison on the Increase in Subjective Vitality and Happiness

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Purpose: The purpose of this research is to examine the effect of eight weeks of family-oriented sports training on the mental vitality and happiness levels of families.

Patients and Methods: This research is classified as applied in terms of its purpose and utilizes a quasi-experimental design. We employed a pretest-posttest control group methodology to compare the effects of the intervention. Data were collected using standardized questionnaires, and analysis was conducted using covariance analysis (ANCOVA). The study included 110 participants, selected through convenience sampling.

Results: The test results showed that exercising with the family in Shanghai, China, has a significantly greater effect on improving happiness (5%) and mental vitality (11%) compared to exercising individually.

Conclusion: The findings of this research indicate that while both forms of exercise significantly enhance mental vitality and happiness, the difference between exercising with family members and exercising alone is not pronounced, possibly influenced by the prolonged conditions of the COVID-19 pandemic. Nonetheless, the positive effects of family-based exercise remain substantial. It is important to recognize that the extent of these differences and effects may vary across different countries. Social support and family cohesion are identified as crucial elements in these exercises, suggesting a valuable model for mental and physical health promotion programs at the community level.

Keywords: family-oriented sports, individual exercise, Chinese families, satisfaction

Introduction

Exercise is a fundamental aspect of human health, contributing not only to physical well-being but also playing a critical role in psychological and emotional health.[1] Defined as physical activity that enhances or maintains physical fitness, health, and wellness, exercise includes a variety of activities ranging from aerobic exercises to strength training, as well as team-based and individual activities.[2] The benefits of exercise are well-documented and encompass a wide range of positive effects on both the body and mind. Physically, exercise helps in weight management, improves cardiovascular health, and strengthens the immune system.[3] Psychologically, it has been shown to reduce stress, improve mood, and enhance overall well-being by promoting the release of endorphins, which are chemicals in the brain that act as natural mood lifters.[4] Furthermore, regular physical activity can enhance cognitive function and foster resilience, particularly in the face of mental health challenges.[5]

In the context of family life, physical exercise can play a significant role in promoting social cohesion and emotional support. For instance, engaging in exercise as a family unit not only provides physical health benefits but also strengthens relationships, boosts morale, and fosters a sense of community and belonging.[6] Family-oriented activities can create opportunities for individuals to bond, communicate, and support each other in their fitness journeys, which has been

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linked to increased happiness and life satisfaction.[7] In contrast, individual exercise, while beneficial, may lack the social reinforcement and shared motivation found in group or family activities.[8]

Despite the acknowledged benefits of both individual and family-based exercise, there remains a gap in the literature regarding the comparative impact of these two types of physical activity on subjective vitality and happiness. While individual sports activities certainly contribute to well-being, it is unclear whether family-based exercise might offer unique advantages in fostering greater emotional resilience and sustained motivation. This study aims to address this gap by exploring the effects of individual versus family-based exercise on happiness and vitality. Specifically, it compares individuals who engage in sports alone with those who participate in physical activities with their family members. By examining the psychosocial benefits of these two modes of exercise, this research seeks to offer valuable insights into the potential role of family-centered sports activities in enhancing overall well-being. The findings of this study may have implications for public health initiatives, sports facility planning, and the promotion of family-oriented fitness programs, with the goal of fostering greater social and emotional health within communities.

The concept of mental vitality, rooted in the theory of autonomy, denotes the individual's intrinsic energy[9]. It is characterized by a sense of aliveness and positive emotions, constituting a crucial aspect of emotional and physical well-being.[10] As a positive psychological factor, mental vitality correlates strongly with improved psychological adjustment and physical health[11]. Happiness serves as another pivotal element of mental health. Generally, happiness entails a subjective appraisal of one's life or circumstances and is intricately linked with an individual's health status and overall quality of life, garnering significant attention from researchers.[12] Essentially, happiness denotes a state of psychological equilibrium characterized by positive emotions such as contentment, vigor, and personal.[13] There exists a correlation between heightened satisfaction, mental vitality, and increased activity levels, suggesting that individuals with greater satisfaction and mental vitality tend to engage more actively.[14]

Rodríguez et al underscores the role of sports and physical activity as paramount in fostering happiness and mental well-being.[15] Sports, as a social phenomenon and an integral aspect of global culture, serves as a unifying force transcending language, race, and religion.[16] It facilitates the maintenance of physical and mental health, fosters moral and personal development, instills confidence, and promotes socialization.[17]

Upon reviewing the aforementioned evidence and research literature, it becomes evident that engaging in sports and various physical activities enhances individuals' morale and vitality. However, the extent of their influence remains inadequately explored. Therefore, this study seeks to address the question: What is the efficacy of family-oriented sports training compared to individual sports training in terms of enhancing people's happiness and vitality?

Methodology

The current research is an applied study conducted using a quasi-experimental method. The statistical population comprises two distinct groups: individuals who regularly engage in individual exercise and individuals who participate in family sports activities. To achieve the research objectives, available samples were selected from both groups. The sample size for both the control and experimental groups consisted of 110 participants, with 55 individuals in each group. Due to the difficulty of accessing all potential participants, a convenience sampling method was employed.

Initially, 127 individuals expressed their willingness to participate in the study. However, due to various factors, such as failure to attend the designed training sessions and the voluntary nature of the study, which allowed participants to withdraw at any stage, some participants exited the study. Ultimately, data from 110 participants who met the study's standards were included in the analysis. This sample size exceeds the minimum recommendations for quasi-experimental research; According to Kemp et al, a minimum of 15 participants in both the experimental and control groups is sufficient to ensure the generalizability and reliability of results.[18] Similarly, Brysbaert (2019) highlights that such a sample size is adequate for achieving sufficient statistical power in semi-experimental studies.[19] Including 110 participants not only meets but surpasses these recommendations, enhancing the validity and robustness of our findings and accounting for potential attrition.

This research was conducted in Shanghai, China. Participants were recruited through a public call and volunteered for the study. To acknowledge their participation, the costs of gym memberships and exercise sessions were covered. After selecting the individuals, Participants were screened for psychological support, medication use, and chronic diseases that

could potentially affect the outcomes of physical activities. Those with significant conditions were excluded from the study to ensure the reliability of the results. Additionally, a self-report questionnaire was used to gather information on these variables.

The assessment tool comprised two questionnaire models: the Oxford Happiness Questionnaire (1989) developed by Argyle et al[20] and the Mental Vitality Questionnaire by Ryan et al.[21] These questionnaires underwent modifications tailored to the characteristics of the study population. Cronbach's alpha coefficient, yielding a reliability score of 0.86 across all variables, was utilized to assess the internal consistency of different sections. Subsequently, the aforementioned questionnaire was administered to both control and experimental groups prior to the commencement of the exercise regimen, focusing on individual and family-oriented participation. This initial data collection aimed to establish baseline measures of happiness and vitality. Following data collection, the experimental group engaged in family-oriented sports activities, distinct from the control group, which pursued individual sports activities only. This design facilitated a comparative analysis between the effects of family-involved exercise and individual exercise on happiness and vitality levels.

The questionnaire consisted of 41 questions, with 5 dedicated to gathering demographic and qualitative data, 29 pertaining to happiness, and 7 addressing vitality. Notably, happiness, as conceptualized by Argyle et al, encompasses positive emotions, satisfaction levels, and absence of negative feelings. The research hypotheses were formulated based on these three happiness components and one mental vitality factor.

The Phases of Family-Oriented Sports Instruction

In designing family-oriented sports activities, the consultation and guidance of two sports experts were sought. Subsequently, the experimental group, comprising 55 individuals committed to engaging in sports activities alongside their family members, was subdivided into six groups. These groups consisted of one with 12 members, three with 9 members each, and two with 8 members each. Tailored to the recommendations of sports experts and considering logistical constraints, these families participated in group exercises twice weekly, with each session spanning 2 hours. Activities included warm-up routines, running, volleyball, and futsal. Participants, including sisters, wives, parents, and other family members, collaborated in these exercises as cohesive units. Demographic details of the participants are outlined in Table 1.

Conversely, the control group comprised 55 individuals who pursued solitary training in gyms or fitness centers, devoid of familial involvement. Both groups adhered to the exercise regimen for a duration of 6 weeks, totaling 12 sessions.

Table 1 Details Regarding Gender Distribution, Age Demographics, and the Count of Family Members

–	Type	Frequency	Percentage
Total	–	110	100%
Gender	Female	62	56.3%
	Male	48	43.6%
Age	Under 25 years	38	34.5%
	Between 26–35 years	40	36.3%
	Between 36–45 years	21	19%
	Over 46 years	11	10%
Family members (55)	Father	5	4.5%
	Mother	5	4.5%
	Sister	9	8.1%
	Brother	7	6.3%
	Husband	8+8	14.5%
	Other family members	13	11.8%

Results

Table 2 displays descriptive statistics concerning the primary research variables. The mean vitality score of the experimental group post-test (24.90) surpasses that of the control group post-test (13.63), while the mean happiness score of the experimental group post-test (63.49) exceeds that of the control group post-test (36.94).

Before performing the analysis of covariance, the normality of the data was assessed using the Kolmogorov–Smirnov test, and the homogeneity of variances was tested with Levene's test, as shown in Table 3. The results of both tests indicated that all research variables followed a normal distribution and the assumption of homogeneity of variances was met (p-value > 0.05 for both tests). Therefore, parametric tests were employed to evaluate the research hypotheses.

Furthermore, the assumption of equal variance of research variables between the two control and experimental groups was examined using Levene's test (in Table 3).

Table 2 Descriptive Criteria Pertaining to Research Variables

group		N	Minimum	Maximum	Mean	Std. Deviation
control	Positive emotion pre-test	55	8.00	13.00	10.7636	1.36033
	Positive emotion post-test	55	7.00	13.00	10.0182	1.87074
	Satisfaction level pre-test	55	21.00	34.00	28.5818	3.27556
	Satisfaction level post-test	55	32.00	40.00	36.1455	2.16383
	Not having negative feelings pre-test	55	20.00	31.00	25.2364	2.90570
	Not having negative feelings post-test	55	18.00	40.00	28.1455	4.66039
	Mental vitality pre-test	55	10.00	18.00	13.7091	1.78131
	Mental vitality post-test	55	9.00	28.00	13.6364	3.95514
	Happiness pre-test	55	28.00	42.00	36.0000	3.77124
	Happiness post-test	55	25.00	50.00	38.1636	5.19887
	Valid N (listwise)	55				
Experimental	Positive emotion pre-test	55	8.00	14.00	11.2182	1.46175
	Positive emotion post-test	55	14.00	25.00	19.1273	2.36529
	Satisfaction level pre-test	55	22.00	32.00	28.2000	2.57049
	Satisfaction level post-test	55	42.00	48.00	44.8727	2.10866
	Not having negative feelings pre-test	55	21.00	32.00	25.7273	2.63491
	Not having negative feelings post-test	55	28.00	54.00	44.3636	5.61533
	Mental vitality pre-test	55	11.00	19.00	14.1818	1.82666
	Mental vitality post-test	55	19.00	31.00	24.9091	2.84977
	Happiness pre-test	55	31.00	44.00	36.9455	2.97158
	Happiness post-test	55	49.00	75.00	63.4909	6.33588
	Valid N (listwise)	55				

Table 3 Table of Kolmogorov–Smirnov and Levene's Test Analysis Results for Happiness Levels

Dependent Variable	Kolmogorov–Smirnov Z	Levene's Test
Positive emotion post-test	0.085	0.470
Satisfaction level post-test	0.16	0.932
Not having negative feelings post-test	0.193	0.429
Happiness post-test	0.336	0.364
Mental vitality post-test	0.466	0.130

According to the findings presented in Table 3, the assumption of equal variance among the research variables in both the control and experimental groups is upheld, indicating statistical significance (p-value > 0.05). Consequently, the dataset is deemed suitable for covariance analysis, enabling the examination of differences between the two groups concerning the dependent variables.

To assess the impact of family-oriented sports training on individuals' happiness levels, the collected data underwent covariance analysis (refer to Table 4). The findings indicate a statistically significant effect of family-oriented sports training on happiness levels (F=6.55, P-value=0.012) after adjusting for pre-test effects on post-test outcomes. This significant effect corresponds to 0.058, indicating that 5% of the total variance in individuals' happiness levels was attributed to family-oriented exercise.

To assess the impact of family-oriented sports training on the generation of positive emotions, the collected data were analyzed using covariance analysis (Table 5). The results indicate that, after controlling for the pre-test influence on the post-test, family-oriented sports training significantly affects the generation of positive emotions (F=8.17, P=0.005). This significant effect size was 0.072, indicating that 7% of the total variance in positive emotion generation is attributable to family-oriented sports exercises.

To assess the impact of family-oriented sports training on people's satisfaction levels, the collected data were analyzed using covariance analysis (Table 6). The results indicate that, after adjusting for the pre-test effect on the post-test, family-oriented sports training significantly affects satisfaction levels (F=5.37, P-value=0.022). The magnitude of

Table 4 Table of Covariance Analysis Results for Happiness Levels

Source	Type III Sum of Squares	*df*	Mean Square	F	Sig.	Partial Eta Squared
Group	222.555	1	222.555	6.555	0.012	0.058
Happiness pretest	11.614	1	11.614	0.342	0.560	0.003
Group * happiness pre-test	9.973	1	9.973	0.294	0.589	0.003
Error	3599.111	106	33.954			
Total	305443.000	110				
Corrected Total	21267.718	109				

Table 5 Table of Covariance Analysis Results for Positive Emotions

Source	Type III Sum of Squares	*df*	Mean Square	F	Sig.	Partial Eta Squared
Group	37.751	1	37.751	8.179	0.005	0.072
Positive emotion pre-test	1.824	1	1.824	0.395	0.531	0.004
Group * positive emotion pre-test	0.022	1	0.022	0.005	0.945	0.000
Error	489.265	106	4.616			
Total	26133.000	110				

Table 6 Table of Covariance Analysis Results for Satisfaction Levels

Source	Type III Sum of Squares	*df*	Mean Square	F	Sig.	Partial Eta Squared
Group	23.984	1	23.984	5.376	0.022	0.048
Group * satisfaction level pre-test	0.101	1	0.101	0.023	0.881	0.000
Satisfaction level pre-test	18.195	1	18.195	4.079	0.046	0.037
Error	472.871	106	4.461			
Total	183096.000	110				

Table 7 Table of Covariance Analysis Results for Negative Feelings

Source	Type III Sum of Squares	*df*	Mean Square	F	Sig.	Partial Eta Squared
Group	112.867	1	112.867	4.182	0.043	0.038
Group * Not having negative feelings pre-test	2.554	1	2.554	0.095	0.759	0.001
Not having negative feelings pre-test	10.998	1	10.998	0.408	0.525	0.004
Error	2860.837	106	26.989			
Total	154692.000	110				

Table 8 Table of Covariance Analysis Results for Mental Vitality

Source	Type III Sum of Squares	*df*	Mean Square	F	Sig.	Partial Eta Squared
Group	156.336	1	156.336	13.173	0.000	0.111
Mental vitality pretest	0.001	1	0.001	0.000	0.994	0.000
Group * Mental vitality pretest	25.272	1	25.272	2.129	0.147	0.020
Error	1257.990	106	11.868			
Total	45636.000	110				

this significant effect was 0.048, meaning that 4% of the total variance in satisfaction levels can be attributed to family-oriented sports activities.

To evaluate the effect of family-oriented sports training on reducing people's negative feelings, the collected data were analyzed using covariance analysis (Table 7). The results show that, after adjusting for the pre-test effect on the post-test, family-oriented sports training significantly impacts the reduction of negative feelings (F=4.18, P-value=0.043). The magnitude of this significant effect was 0.038, indicating that 3% of the total variance in the reduction of negative feelings can be attributed to family-oriented sports training.

To evaluate the effect of family-oriented sports training on people's mental vitality, the collected data were analyzed using covariance analysis (Table 8). The results indicate that, after adjusting for the pre-test effect on the post-test, family-oriented sports training has a significant impact on mental vitality (F=13.17, P-value=0.000). The magnitude of this significant effect was 0.11, meaning that 11% of the total variance in mental vitality can be attributed to family-oriented sports exercises.

Figure 1 illustrates the results pertaining to the variations in research variables associated with sports training within the family context, providing a clearer understanding.

Discussion

By examining basic definitions, we understand that happiness refers to a general and long-term state of joy and life satisfaction. This concept encompasses positive feelings and overall life contentment and is often associated with optimism, relaxation, and a general sense of well-being over time.[22] Additionally, happiness pertains to the ability to cope with challenges, as people with high mental vitality typically possess high motivation, creativity, and focus, feeling capable of managing daily stressors and problems effectively.[12] Sports can be considered a non-pharmacological means to enhance people's motivation and life expectancy, and it can be used to improve both happiness and vitality.[23] To investigate the impact of sports on these aspects of well-being, a semi-experimental study was conducted. Participants were divided into two groups: a control group engaging in individual sports exercises and an experimental group participating in family sports exercises. This approach aimed to highlight the differences between individual and family-oriented sports on levels of vitality and happiness.

To address the main research question, it was found that family-based physical activities have a greater impact on increasing individuals' happiness and vitality compared to individual sports. These findings have significant implications

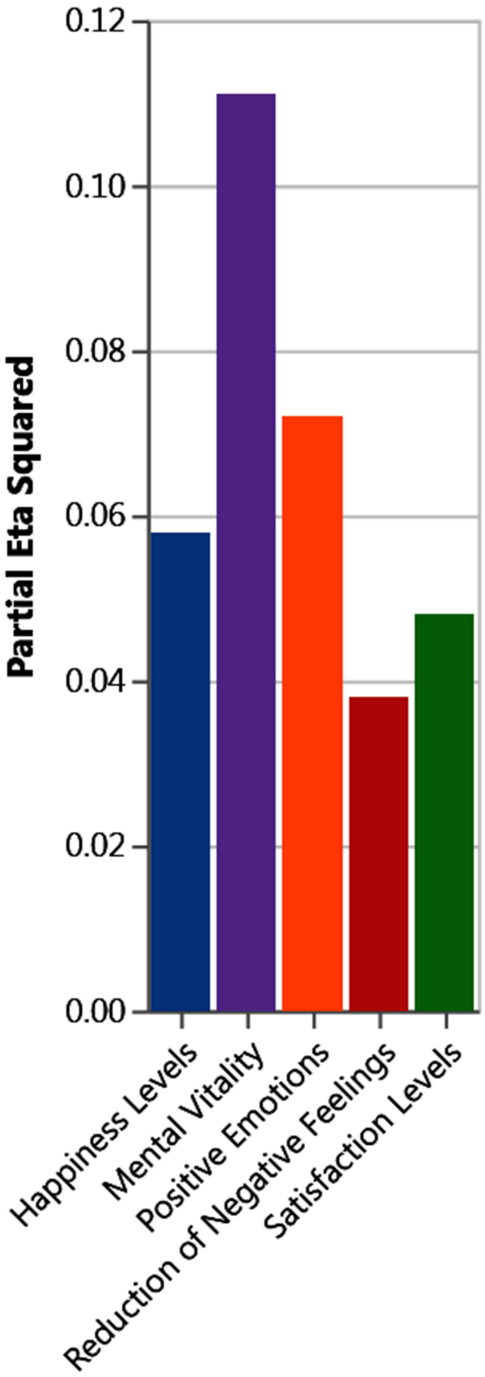

Figure 1 A Comparative Analysis of Changes in Research Variables.

for enhancing family-oriented physical activity programs aimed at improving psychological and emotional well-being, particularly in contexts where social isolation or emotional distress is prevalent. The results suggest that encouraging families to participate in sports activities can be a strategic approach to improving physical health and interpersonal relationships, which are essential for enhancing life satisfaction.[24] Moreover, the findings emphasize the importance of promoting family participation in physical activities as a tool for fostering sustainable exercise habits, which are critical for long-term health benefits. The outcomes of this study are consistent with the findings of Lee et al,[25] Smith and Merwin[26,] and Guagliano[27] which highlight the psychosocial benefits of engaging in physical activity in a social context. For instance, Lee et al explored the positive relationship between physical activity and health and happiness, emphasizing

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that family-centered physical activities maximize participation and foster better and happier lives for community members. Similarly, Smith and Merwin (2021) demonstrated that family-based sports can strengthen social connections and family cohesion, leading to increased happiness and life satisfaction.

The present study also revealed that while individual sports improve physical and mental health and enhance happiness, they may be less effective than family-based sports. This aligns with the findings of Santos et al[28] and Spagnola & Fiese,[29] likely due to the inherent social support and bonding provided by family-centered activities. Participating in sports with family members can strengthen relationships, improve communication, and foster a sense of belonging and mutual support. Additionally, family involvement creates motivation and accountability, as family members can encourage one another and help maintain a consistent exercise routine. This mutual encouragement and shared commitment can lead to more sustainable physical activity, which is crucial for long-term health benefits. These factors are well-documented contributors to overall well-being and happiness.

Furthermore, the shared experience of overcoming physical challenges and achieving goals together can strengthen emotional bonds and create lasting positive memories, making family-based physical activities more effective than individual exercises. However, it is important to note that the significant difference found in this study ($p = 0.058$) was marginal, warranting further investigation into gender and geographic factors. For example, a study conducted in Shanghai, China, reported a relatively small difference of about 5% between the two groups of participants. This discrepancy could be attributed to factors such as adolescents' preference for participating in sports with friends, cultural differences, and the post-COVID-19 era, where family members are likely to have spent considerable time together during lockdowns. These aspects require more thorough examination.

In contrast, the results of this study differ from the findings of Hill et al,[30] who concluded that individual sports are more effective for improving mental health outcomes in certain demographic groups, particularly older adults who may feel more comfortable engaging in individual activities. This discrepancy could be due to a lack of familial intimacy or unwillingness to participate in family sports, as well as reasons such as social anxiety or embarrassment in group settings.

Furthermore, the study accounted for potential confounding variables, including the use of medication and the presence of specific medical or behavioral conditions, which may have influenced the outcomes. Participants were carefully screened for factors such as psychological support, medication usage, and chronic illnesses that could alter the psychological and physiological benefits of physical activity. For instance, individuals undergoing psychological therapy or taking medications that modulate mood or overall well-being may experience different effects from exercise compared to those without such interventions.[31] To mitigate the influence of these factors, participants with significant medical conditions were excluded from the study, ensuring the validity and reliability of the findings. Nevertheless, future research should explore the interaction between these variables and the type of exercise modality (individual vs family-based) to gain a more comprehensive understanding of their effects on overall well-being.

The findings of this study revealed that family-based physical activities have a greater impact on fostering positive affect in individuals. These results underscore the importance of family sports in enhancing the emotional aspects of life and suggest that engaging in family-oriented physical activities can play a significant role in elevating levels of positive affect and improving quality of life. The implications of this research can assist individuals in overcoming physical, mental, psychological, and social pressures stemming from daily life. Through participation in family sports, individuals have more opportunities for social interactions, which can lead to increased social acceptance and emotional support[26]. Additionally, such activities contribute to boosting self-esteem and fostering a positive self-image by enhancing self-efficacy, thereby promoting higher levels of positive affect.[32] These findings are consistent with the research of Zhou et al,[33] Furusa et al,[34] and Strandbu et al.[35] Zhou et al identified a direct impact of positive family relationships on participation in physical activities and the generation of positive affect. Similarly, Furusa et al demonstrated that parental involvement in sports and support from clubs and sports organizations could enhance the emotional experiences of both children and parents. Likewise, Gibney et al[36] emphasized the increasing popularity of healthy family lifestyles, particularly among younger generations, showing that physical activities involving parents and children contribute to improved mental well-being and mood regulation.

However, the results of this study diverge from those of Kanamori[37] who found that individual sports might have a greater impact on mental well-being in certain demographic groups, including adults. This discrepancy could be

attributed to differences in personal preferences or the specific psychological needs of individuals. Nevertheless, the strong evidence presented in this study and related research emphasizes the unique and positive role of family-based sports in cultivating positive affect and providing emotional support.

The statistical analysis in this study revealed that family-oriented physical activities have a more significant impact on individuals' satisfaction levels compared to individual sports. The implications of these findings are considerable for communities and societies. Since life satisfaction is a crucial aspect of quality of life, enhancing it through family-based physical activities can lead to improvements in the psychological and social health of society.[21] These findings could assist policymakers and planners in designing and developing family-oriented sports programs that promote mental health, strengthen social bonds, and reduce stress and tension within families.

The findings of this study align with the results of the research by Hubers and Webink[38] and Kim et a,[39] which demonstrated that changes in individuals' positive emotions resulting from physical activities enhance the transmission of these feelings to others, ultimately increasing life satisfaction. Additionally, Kim et al reported a strong relationship between physical activities, happiness, and life satisfaction. These studies highlight the importance of exercise in fostering satisfaction and improving quality of life. In terms of explaining these findings, it can be argued that regular physical activity reduces stress, and stress reduction is directly related to an increase in life satisfaction.[27] Moreover, family-oriented sports provide opportunities for positive experiences, empowerment, and confidence building, which ultimately influence individuals' satisfaction levels.[32] As Brooke et al stated, life satisfaction, as a conscious cognitive judgment of life quality, is influenced by social and emotional interactions, and family-oriented sports activities enhance these interactions.[40]

In conclusion, this study revealed that family-oriented physical activities have a more significant impact on reducing negative emotions in individuals compared to individual exercises. This finding has important implications for the development of sports programs and mental health initiatives. Specifically, these results can be used to design and implement family-oriented programs in sports centers, schools, and local communities. The findings of this study are consistent with the research by Tingaz et al[41] and Zhang et a.[42] For example, Tingaz et al found a positive and significant correlation between physical activity, increased happiness, and reduced negative emotions among student-athletes. They highlighted that positive psychological emotions play a mediating role between physical activity and happiness, ultimately leading to the reduction of negative emotions.

In explaining the findings of this hypothesis, it's important to consider lifestyle habits. Family-oriented physical activity can help individuals maintain positive habits and reduce negative feelings, such as decreasing sedentary behavior.[42] In summary, according to existing literature, family-oriented sports can impact individuals' positive feelings through mechanisms involving physical and mental health, stress management, and the promotion of desirable daily habits. Regular sports sessions with family members thus contribute to a reduction in negative feelings, as there is a meaningful relationship between happiness, psychological well-being, and the mitigation of negative emotions.[36] Physical activity predicts and reinforces changes related to psychological well-being in a significant and positive manner. Therefore, sports and family-oriented activities can enhance psychological well-being and diminish negative feelings by fostering happiness.

However, it's crucial to acknowledge the limitations of the study design as a semi-experimental experiment. While family-centered activities demonstrate a greater effect, variation between individuals and families may yield different results. Personal preferences, family dynamics, and prior exercise experiences could influence outcomes and warrant further investigation. Future research should delve into the long-term effects of family-centered exercise training and explore how various family dynamics and types of exercise impact outcomes. Moreover, broadening the study to encompass diverse populations and age groups can offer a more comprehensive understanding of the benefits of family-oriented physical activities.

Conclusion

This study offers valuable insights into the advantages of family-centered exercise training over individual exercise regimens. The findings indicate that engaging in physical activities with family members enhances people's mental vitality and happiness to a greater extent than individual exercises. This heightened effect is likely attributable to the combined impact

of familial social support, mutual motivation, and emotional bonds among family members. These findings carry practical implications for promoting family-oriented physical activities as a means to enhance overall well-being. They can serve as a roadmap for sports managers and policymakers in cities and other regions to develop specific infrastructures aimed at expanding family sports facilities and fostering a culture of family sports. By doing so, they can mitigate social issues, strengthen familial and emotional connections, and ensure the provision of necessary infrastructure.

Ethical Approval

This study was conducted at Henan University of Technology, China, and received ethical approval from the Ethics Committee of Henan University of Technology (Approval No. IEC/ZZU/SPE493). All procedures followed the ethical standards set forth in the Declaration of Helsinki and relevant institutional guidelines. Written informed consent was obtained from all participants prior to their involvement in the study.

Acknowledgments

The authors declare that there are no conflicts of interest. The experiments comply with the current laws of the country where they were performed. The data that support the findings of this study are available on request from the corresponding author.

Author Contributions

All authors have significantly contributed to the work reported, including conception, study design, execution, data acquisition, analysis, and interpretation, or a combination of these areas. They have actively participated in drafting, revising, or critically reviewing the article, provided final approval for the version to be published, agreed on the journal for submission, and accepted accountability for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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