

# 基于“五行学说”理念的生物能量检测仪的测试试验

## ——探索太极拳运动实时健身效果的特色研究

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**摘要：研究目的：**我们的民族传统体育与文化思想，由于“知”与“行”在一些条件下不能同步实施学习，长期以来青年大学生对于太极拳运动健身效果，存在着不同程度的误解，甚至有严重地质疑。太极拳，武术运动的一个拳种。它蕴含着丰富民族传统文化思想，兼具健身、养生、防卫技能等多功能于一体的一项武术运动。2020年12月17号联合国教科文组织保护非物质文化遗产政府间委员会通过决议，将我国“太极拳”列入联合国教科文组织非物质文化遗产代表作名录。如何更好地弘扬、传承民族传统体育太极拳运动？如何更好地激发同学们学习兴趣，提高太极拳学习效率，更快形成太极运动技能，服务于大学生对于健身、健康体育运动的需求？实践与研究证明，学习太极拳动作技术，“知”与“行”紧密结合，才能更好地掌握太极拳运动技术，收获更大的太极运动健身效果。目前，从中医的五行学说基础理论的视角，以现代科技智能仪器为应用手段，通过生物能量变化为指标数据，进行太极拳运动实时健身效果的研究，本人所看到的这类论文研究文献比较少。因此，该论文的太极拳运动健身实时效果的探索研究，无论是促进太极拳运动在青年大学生中弘扬与普及，促进科学地进行太极拳健身运动，还是提高大学生对于太极拳运动的民族文化思想的科学认知，树立民族文化自信，都是非常有现实价值意义的。**研究手段：**以16式简化太极拳为内容，太极拳体育课堂为平台，以选修太极拳课19-21岁大学生为研究对象，人数166人次，采用生物能量检测仪和心理调查问卷，在太极拳运动前、后分别进行两次测评，将试验测得和调查问卷的指标原始数据，使用SPSS Statistics软件对其进行统计学配对t检验。所采用的设备是获国际权威（USA.FAD ADMINISTRATION）认证的生物能量检测仪，生物反馈设备是一类能够监测人体生理指标，并将这些信息反馈给用户的设备。它们的发展得益于传感技术、数据处理和人工智能算法的进步，为人们提供了更准确、实时的生物信息反馈。其试验方法，即太极拳运动前、后，以触摸方式将双手放于仪器传导接收感应位置，采集手

部生物电传导的变化，并迅速地对人体的生物能量场进行检测。其原理是利用生物能量场的原理，利用了对人体无害的微弱生物电流，通过手掌、指，检测太极拳运动前、后手部生物电变化对比，实时地了解太极拳运动后对人身心理健康影响的内在变化基础，及其健身特点。这一仪器（AURA）的测试是依据手部全息论的理论观点，以中医“五行学说”基础理论作为论证依据的试验研究。**研究结果：**在长期太极拳教学实践中，在积累大量关于太极拳运动对于大学生健身效果总结资料基础上，体育、医学、心理等跨学科师资联合，进一步试验论证了太极拳运动健身的实时效果，证明了太极拳运动对于大学生身心两个方面具有显著的调节、改善与提高作用。（1）通过仪器检测试验，表明受试同学们其太极拳练习前身体能量指标数值由 567.94 提高至太极拳运动后的 656.19，身体能量值提升变化在统计学上具有显著性变化意义。（2）通过仪器检测试验，太极拳课的运动前同学们身体活力与身体稳定度比值 65.54:43.55，身体活力与身体稳定度比值的标准范围，一般适当比值范围 60:40，青年人是 70:30，50 岁以后为 50:50。太极拳课后同学们身体活力度与稳定度比值朝着 70:30 标准比值范围变化，即变为 77.01:30.75。由此，可以看到太极拳运动后，受试者同学们的身体活力、身体稳定性二者之间的协调、制约、平衡的整体机能状态趋于理想的范围变化。（3）通过仪器检测试验，太极拳运动后同学们的“五行”指标数值普遍提升。“五行”指标指木（肝）、火（心）、土（脾）、金（肺）、水（肾）。太极拳运动前同学们的“五行”指标数值平均数 107.54，略低于 110-120 标准值范围，太极拳后“五行”指标平均数普遍提高，上升至 126.94，同学们行为更积极和有活力，尤其增强了青年大学生受试者消化吸收的基础代谢能力，在指标数据变化上更为突出，促进了呼吸功能的效果改善，有益于免疫力增强。（4）通过仪器测评与心理调查问卷结果分析，并结合教学实践以及同学们体育总结，太极拳运动对同学们舒缓压力、恢复体力、平复情绪、调整焦虑、郁闷心情等几个方面，都有突出的积极影响效果，在统计学上具有显著性变化意义。**研究结论：**我们从过去的定性研究总结基础上，发展到定量数据指标的仪器测试试验研究，高校太极拳体育课对于受试者大学生健身效果实时影响价值的研究结论如下：第一，太极拳运动对于青年大学生身体细胞活力具有明显的健身提升效果。柔和、缓慢的太极拳运动后，对于处在生命力旺盛阶段的青年大学生，使其身体能量指标数据明显提升。通过仪器检测试验，表明受试同学们其太极拳练习前身体能量指标数值为 567.94，太极拳运动后提高至 656.19，这种提高变化具有统计学显著变化意义。另外，从太极拳课堂练习实践，同样反映出了一致性的这种良好变化，即太极拳课前同学们神情倦怠，情绪和精神比较低沉，而在太极拳课的运动过程中，同学们精神面貌逐渐发生变化，即神态越来越放松，情绪越来越平和，脸上的笑容增多，同学之间交流、互动

频率提高,更加主动、积极地参与太极运动健身练习。第二,太极拳运动后有效地调节了同学们身体机能的兴奋性与抑制性二者的平衡、协作的适当关系。身体活力与身体稳定度比值,一般适当比值范围 60:40,青年人是 70:30,50 岁以后为 50:50。根据仪器设备标准数据的标准值,接近 60:40 和 70:30 比值,属于协调、比较协调的同学,50:50 比值以下的身体细胞活力处于弱态或比较低弱的状态,70:30 比值以上的比较兴奋,甚至亢奋的状态,以及身体稳定度数值明显高于身体活力数值的比值等四个大类型的身体状态。通过仪器检测试验,太极拳运动前所测得同学们身体活力和身体稳定度二者关系,过高、过低的比值状态的同学,太极拳运动后,过高的使其降低,过低的使其提高,受试者同学们的身体活力、身体稳定性二者之间的协调、制约、平衡状态向着积极、适当的状态调整,其中相当一部分同学即低弱和比较低弱,以及比较协调的身体活力、身体稳定度二者比值的同学们,明显地趋于理想的标准范围变化。其本质意义即太极拳运动促进人身体机能和健康朝着阴阳相反、相承的两个方面保持在一个动态协调、制约、平衡的理想方向调整变化,从而实现健身、健康的影响价值。第三,太极拳运动后同学们身体的“五行”各指标数值,由低弱都得以提升,其中脾胃(土)和肺(金)的指标数据提升最突出。通过生物能量检测仪测试,针对学习压力大、课业繁重的清华学生群体的试验检测,绝大部分同学太极拳运动前的身体机能普遍处于偏低、偏弱的状态。柔和、缓慢的太极拳运动,看似“轻松”的运动形式,促进了青年大学生人体“五行”各项指标能量数值朝着标准值范围变化,在统计学上具有显著性变化意义。其中,提升幅度最为明显的两项指标,即脾胃(土)、肺(金)。脾胃是人体消化器官,脾胃功能改善、提高,促进了人体的基础代谢,有利于提升人体营养补充、体力、精力的恢复与改善。此外,肺(金)指标数据提升意义,预示着肺的呼吸功能改善,免疫能量值提高,以及小肠吸收功能的提升,并与脾胃指标的提高相一致,加强了人的消化吸收的基础代谢能力,揭示了太极拳运动的实时健身影响特点,及其健身价值意义。因此,对于体弱多病的人群,以及防疫、抗疫期间,面对“阳康”人群体力下降明显,消化系统、循环系统、呼吸系统以及免疫力等受到严重侵袭的情况,国家大力宣传、推行太极拳运动健身,无论在实践中,还是通过仪器设备检测的试验结果,都是适合、有效的运动健身手段。第四,太极拳运动对于同学们的心理健康、情绪调节,具有积极影响效果。通过仪器测评与心理调查问卷结果分析,结合多年的同学们体育总结,都反映了太极拳运动对同学们舒缓压力、恢复体力、平复情绪、调整焦虑,疏解紧张和郁闷心情等几个方面,具有明显的积极影响效果。第五,跨学科“体医结合”促进了当今大学生对于太极拳运动的健身、健康效果的科学认知水平。通过仪器检测的直观指标数据,揭示了古老、传统的太极拳运动技术、运动基础理论思想的科学价值意

义, 以及太极拳健身功效的生理基础, 激发了同学们学练太极拳的兴趣, 促进了太极拳的教学效率, 也坚定了同学们对于太极拳运动健身价值的科学认知。此外, 仪器检测对于太极拳运动所蕴含的“五行学说”, 运用了现代科学话语体系进行了解读和宣传, 有益于促进青年大学生树立民族文化自信。 **建议:** 重视并充分发挥高校太极拳体育课对于大学生的健身、健康的影响价值。高校公共体育课, 一般是 90 分钟/课, 通过试验测试表明太极运动至少持续不间断地 40-50 分钟的学习与练习, 对于同学们身心两个方面的健康影响, 将会产生明显的干预效果。因此, 我们要不断深化太极拳教学改革, 提高每周一次的高校太极拳体育课对于青年大学生的健身影响价值, 科学安排太极拳课的运动量、运动强度, 以更好地发挥太极拳运动强身健体效果的最大价值。

**关键词:** 体医结合、五行学说、太极拳、健身特色

## **Exploring the Real-time Fitness Effects of Tai Chi Exercise: A Test Experiment using a Biophysical Energy Detection Device based on Five Elements Theory**

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**Abstract: Research Objective:** Our traditional national sports and cultural ideologies encounter challenges in effectively aligning theoretical knowledge with practical implementation, leading to varying degrees of misconceptions and even profound skepticism among young college students regarding the fitness benefits of Tai Chi exercises. Tai Chi, as a martial art form, embodies a rich tapestry of traditional cultural ideologies, encompassing fitness, health preservation, and self-defense skills. Notably, on December 17, 2020, the United Nations Educational, Scientific and Cultural Organization (UNESCO) inscribed "Tai Chi" into its list of intangible cultural heritage from China. Therefore, the promotion and preservation of our national traditional sport, Tai Chi, and the fostering of its adoption among young college students becomes a critical imperative. Additionally, our aim is to kindle their interest in learning Tai Chi, enhance the pedagogical efficiency of Tai Chi instruction, and expedite the acquisition of Tai Chi movement skills to cater to college students' needs for physical fitness and well-being. Empirical findings

from practice and research underscore that an integrated approach that bridges theoretical knowledge and practical application in learning Tai Chi movements is pivotal for a comprehensive grasp of the techniques and for maximizing fitness gains from Tai Chi exercises. Currently, research on the real-time fitness effects of Tai Chi exercises, particularly from the perspective of Traditional Chinese Medicine's Five Elements theory and utilizing bioenergy changes as empirical indicators, remains limited. Hence, this research, which explores the real-time fitness effects of Tai Chi exercises, holds significant practical implications for promoting and popularizing Tai Chi among young college students. Furthermore, it serves as an avenue for safeguarding our national cultural heritage and scientifically advancing Tai Chi fitness practices to cater to college students' physical fitness and health needs. **Research Method:** The study design involves a simplified 16-form Tai Chi curriculum, implemented within Tai Chi physical education classes, with 166 college students aged 19 to 21 years as research participants. This research employs bioenergy detection devices and psychological questionnaires, conducting two assessments before and after Tai Chi exercise. Statistical analysis was performed using SPSS Statistics software, employing paired t-tests for the raw data from experimental measurements and questionnaires. Notably, the bioenergy detection device utilized in this study holds certification from the United States Food and Drug Administration (FDA). During the tests, participants place their hands on the device's conductive sensor pads to monitor real-time changes in the body's bioelectricity, specifically measured at the fingers, both before and after Tai Chi exercise. The instrument's principle relies on the concept of the body's bioenergy field and utilizes harmless weak bioelectric currents to evaluate internal changes in a person's physical and mental health resulting from Tai Chi exercise. The experimental procedures are conducted with the AURA instrument, grounded in the theoretical framework of holographic hands and rooted in the foundational theories of Traditional Chinese Medicine's Five Elements. **Research Findings:** Based on extensive long-term Tai Chi teaching practice and the accumulation of a substantial corpus of data regarding the fitness effects of Tai Chi exercises on college students, this study engaged in interdisciplinary collaboration among faculties of physical education, medicine, and psychology to rigorously experimentally validate the real-time fitness effects of Tai Chi. The results unequivocally demonstrated significant regulatory, improvement, and enhancement effects on both the physical and mental well-being of college students. **The salient outcomes are as follows:** ① Instrument tests revealed

a noteworthy increase in participants' bioenergy indicator values from 567.94 before Tai Chi practice to 656.19 after the exercise, yielding statistically significant changes. ② Additionally, an instrument test examined the ratio of physical vitality to stability before Tai Chi class, which measured 65.54:43.55, deviating slightly from the standard range of 60:40 for general appropriateness, 70:30 for young individuals, and 50:50 for those over 50 years old. Remarkably, post-Tai Chi class, the ratio of physical vitality to stability exhibited a significant shift towards the standard range, registering at 77.01:30.75. Consequently, after Tai Chi exercise, the participants' overall functional state of coordination, restriction, and balance between physical vitality and stability approached the ideal range. ③The "Five Elements" indicators, encompassing Wood (Liver), Fire (Heart), Earth (Spleen), Metal (Lungs), and Water (Kidneys), also displayed a uniform elevation following Tai Chi exercise. Prior to Tai Chi practice, the average value of the "Five Elements" indicators among participants was 107.54, slightly lower than the standard range of 110-120. However, after Tai Chi exercise, the average value of the "Five Elements" indicators rose significantly to 126.94. Participants exhibited more proactive and dynamic behavior, particularly manifesting enhanced basic metabolic capacity for digestion and absorption, especially salient among young college students. Moreover, the changes in indicator data were prominent, indicating improvements in respiratory function and heightened immunity. ④ Through the analysis of instrument evaluations, psychological questionnaires, teaching practices, and students' sports summaries, Tai Chi exercise demonstrated noteworthy positive effects on several aspects, including stress reduction, restoration of energy, emotional stabilization, anxiety mitigation, and alleviation of depressive sentiments among college students. These constructive impacts were statistically significant. **Research Conclusion:** Drawing upon qualitative research summaries from the past, this study advanced towards quantitative data indicators through rigorous instrument testing. The investigation of Tai Chi physical education classes' real-time impact on college students' fitness yielded significant results, illuminating the remarkable potential of Tai Chi exercises to foster the physical and mental well-being of this population. Firstly, Tai Chi exercise demonstrates a significant fitness-enhancing effect on the cellular vitality of young college students. The gentle and deliberate movements characteristic of Tai Chi lead to a remarkable increase in the bioenergy indicator data among young individuals in their prime. Through meticulous instrument testing, it was observed that the participants' bioenergy indicator

values rose from 567.94 before engaging in Tai Chi practice to 656.19 after the exercise, indicating a statistically significant improvement. Moreover, this favorable trend in bodily vitality was consistently observed during Tai Chi class sessions. Prior to commencing the practice, students appeared fatigued with subdued spirits and emotions. However, as the Tai Chi exercise progressed, their mental outlook gradually transformed, resulting in a more relaxed and composed demeanor, accompanied by an upsurge in smiles on their faces. Notably, students escalated their frequency of communication and interaction, exhibiting heightened enthusiasm and active involvement in Tai Chi exercise and fitness endeavors. Secondly, Tai Chi exercise effectively regulates and harmonizes the equilibrium between excitatory and inhibitory aspects of students' physiological functions. The ratio of physical vitality to stability typically falls within the range of 60:40 for general appropriateness, 70:30 for young individuals, and 50:50 for those above 50 years old. In accordance with the instrument's standard data, individuals with ratios approaching 60:40 and 70:30 were deemed harmoniously coordinated, while those with ratios below 50:50 exhibited weaker cellular vitality, and those exceeding 70:30 displayed heightened excitement or even overstimulation. Moreover, certain participants displayed conspicuous disparities between their stability and vitality values. However, through thorough instrument testing, it was evident that after participating in Tai Chi exercise, individuals with imbalanced ratios experienced a rectifying shift towards equilibrium. Those with excessively high ratios saw reductions, whereas those with low ratios demonstrated marked improvements. Subsequently, the coordination, restriction, and balance between participants' physical vitality and stability converged towards a more positive and appropriate state. This pronounced transformation was particularly evident among individuals with low and relatively low ratios, as well as those with relatively balanced ratios, which approximated the ideal standard range. The fundamental implication of these findings resides in Tai Chi exercise's capacity to foster dynamic coordination, restriction, and balance in bodily functions and health, aligning with the complementary and opposing principles of Yin and Yang, ultimately contributing to valuable fitness and well-being outcomes. Thirdly, Tai Chi exercise exhibited significant enhancements in the various indicators of the "Five Elements" within the students' bodies, with notable improvements observed in the Spleen (Earth) and Lungs (Metal) indicators. Through the implementation of bioenergy detection devices and targeted testing on a group of Tsinghua students experiencing academic stress and a heavy workload, it was evident

that before engaging in Tai Chi practice, the majority of participants displayed bodily functions that were generally in a low and weakened state. However, the gentle and gradual movements of Tai Chi, despite their seemingly "relaxed" appearance, effectively induced positive changes in the energy values of the "Five Elements" indicators among young college students, with statistically significant improvements. Notably, the most pronounced elevations were observed in the indicators of Spleen (Earth) and Lungs (Metal). The enhancement in Spleen function, a vital digestive organ, contributed to the promotion of basic metabolism, facilitating improved nutrition replenishment, physical recovery, and mental well-being. Additionally, the elevated Lungs (Metal) indicators indicated improved respiratory function, increased immune energy, and enhanced small intestine absorption, which were consistent with the enhancements observed in Spleen indicators. These findings underscore the inherent value of Tai Chi exercise in generating real-time fitness effects and its substantial contributions to overall well-being. Consequently, for individuals with weak constitutions and during periods of epidemic prevention and control, when physical fitness, digestive, circulatory, respiratory, and immune systems may face significant challenges, the widespread promotion and implementation of Tai Chi exercise as a fitness regimen, supported by both practical application and instrumental testing results, proves to be an effective and appropriate approach to foster improved health. Fourthly, Tai Chi exercise exerts positive effects on students' mental health and emotional regulation. The analysis of instrument evaluations and psychological questionnaires, combined with the accumulation of student sports summaries over the years, all converge to indicate the evident positive impacts of Tai Chi exercise on stress reduction, physical rejuvenation, emotional stabilization, anxiety alleviation, tension relief, and depression mitigation. Fifthly, the interdisciplinary approach of "integrating physical education and medicine" has yielded valuable insights into contemporary college students' scientific comprehension of the fitness and health effects of Tai Chi exercise. The visual indicators derived from instrument testing have unveiled the scientific significance of the age-old and traditional Tai Chi exercise techniques, along with their fundamental theoretical principles. This has sparked students' interest in learning and practicing Tai Chi, enhanced the efficiency of Tai Chi instruction, and solidified their scientifically grounded recognition of the fitness value of Tai Chi exercise. Additionally, the instrumental analysis has shed light on the "Five Elements Theory" inherent in Tai Chi exercise, effectively communicated through a modern scientific language system,



fostering the establishment of national cultural confidence among college students.

**Recommendation:** It is crucial to prioritize and fully exploit the significant impact of college-level Tai Chi physical education classes on the fitness and health of students. In general, college public physical education classes last for 90 minutes per session. Rigorous experimental testing has demonstrated that continuous and uninterrupted Tai Chi practice for at least 40-50 minutes during these classes can yield notable intervention effects on both the physical and mental well-being of students. Consequently, it is imperative to continually deepen the reform of Tai Chi teaching in educational institutions by enhancing the influence of weekly college Tai Chi physical education classes on the fitness of young college students. To achieve this, it is essential to scientifically plan the exercise volume and intensity of Tai Chi sessions, thereby maximizing the potential of Tai Chi exercise for promoting physical strength and overall well-being.

**Key words:** Integration of Medicine and Physical Education, Five Elements Theory, Tai Chi, Fitness Characteristics