

正念太极拳改善大学生手机成瘾行为与提高抑制功能作用的研究

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摘要: 研究目的: 手机成瘾 (mobile phone addiction, MPA) 是指非物质成瘾前提下过度使用手机对个体生理和心理上造成不良后果的一种成瘾行为, 表现为对手机的强烈渴求、失去控制、心理依赖以及生活功能受损。中国大学生 MPA 高发患病率为 21.3%。目前 MPA 的干预研究尚处于理论发展阶段, 主要集中在认知疗法和运动疗法等。正念作为一种积极人格特质能够影响大学生手机成瘾问题。其原因可能是正念水平高的个体, 注意力水平较高, 更容易关注当下的活动, 并减少个体冗思和增加对负性思维的控制力, 最终提高整体认知能力。而正念太极拳干预有助于网络成瘾、药物成瘾等成瘾行为的改善和执行功能的提高。越来越多的证据表明, 无论是急性还是长期的正念太极拳干预均可改善不同人群执行功能和认知能力。而执行功能与手机成瘾的关系更为密切。其中, 抑制功能使个人能够专注于与任务相关的信息并抑制无关信息, 与一个人的成瘾或健康行为最直接相关, 但这些变量之间关系仍不清楚。

研究旨在探讨 8 周正念太极拳干预对大学生手机成瘾情况、正念水平和执行功能及各项子功能的影响, 并探讨其在正念太极拳干预改善大学生手机成瘾情况中的可能机制。**研究方法:** 本研究选取北京某高校大学生作为研究对象, 采用手机成瘾指数 (MPAI) 量表筛选出得分高于 40 分的人员纳入本研究, 排除心血管疾病、呼吸系统疾病、骨关节疾病、抑郁症、焦虑症等情况, 最终纳入 66 名符合本研究要求的研究对象, 平均年龄 18 至 21 岁, 随机分为对照组 (33 人) 和实验组 (33 人)。对照组维持正常体力活动水平, 不实施额外干预, 实验组进行 8 周正念太极拳干预, 实验所采用的干预中太极拳部分选用杨氏太极拳动作为基础, 正念部分则是包括正念无极桩以及舒缓, 柔和的音乐来引导习练者专注于自身、回归内心的平静, 运动时间为每次 40min, 其中配合正念引导语进行的无极桩练习 5min, 八式太极拳练习 30min (4min*6 套, 组间间歇 1min), 音乐配合的无极桩放松部分 5min, 运动频率为每周 3 次。采用梁永炽研制的适用于大学生的手机成瘾量表 (MPAI) 评价干预前后手机成瘾情况, 选用 2003 年 Brown 和 Ryan 编制的正念注意觉知量表 (MAAS) 评价干预前后正念

水平。采用执行功能测试工具，测试包含 Flanker 任务（抑制功能）、2-back 任务（刷新功能）和 More-odd shifting 任务（转换功能）评价执行功能，测试指标为反应时（毫秒）和正确率（%）。采用 2（时间：前测、后测） \times 2（组别：实验组、对照组）进行重复测量方差分析，采用 Pearson 进行变量量量之间的相关分析，采用温忠麟等提出的新中介效应程序 Model4 进行中介效应检验。**研究结果：**（1）实验组和对照组在手机成瘾情况（ $t = -0.110$, $p = 0.913 > 0.05$ ）、正念水平（ $t = 0.883$, $p = 0.381 > 0.05$ ）和执行功能各子功能抑制功能（正确率 $t = -0.861$, $p = 0.393 > 0.05$ ；反应时 $t = -0.876$, $p = 0.384 > 0.05$ ）、刷新功能（正确率 $t = -0.448$, $p = 0.656 > 0.05$ ；反应时 $t = -0.046$, $p = 0.963 > 0.05$ ）和转换功能（正确率 $t = 1.165$, $p = 0.248 > 0.05$ ；反应时 $t = 0.046$, $p = 0.963 > 0.05$ ）水平上无显著差异，具有同质性。

（2）8 周正念太极拳干预后测实验组与对照组手机成瘾指数具有显著性差异（ $F = 6.167$, $p = 0.016 < 0.05$ ），并后测实验组与对照组正念水平具有显著性差异（ $F = 4.146$, $p = 0.046 < 0.05$ ）和后测实验组与对照组执行功能各项子功能水平，包括抑制功能正确率（ $F = 15.466$, $p = 0.000 < 0.01$ ）和抑制功能反应时（ $F = 13.330$, $p = 0.001 < 0.01$ ）、刷新功能正确率（ $F = 0.405$, $p = 0.527 > 0.05$ ）和刷新功能反应时（ $F = 1.078$, $p = 0.303 > 0.01$ ）和转换功能正确率（ $F = 12.474$, $p = 0.001 < 0.01$ ）；（3）正念太极拳干预前后，手机成瘾指数下降与抑制功能反应时变化值（ $r = 0.756$, $p = 0.000 < 0.01$ ）、刷新功能反应时变化值（ $r = 0.035$, $p = 0.045 < 0.05$ ）和转换功能反应时变化值（ $r = 0.397$, $p = 0.022 < 0.05$ ）两两相关均具有显著性；而正念水平提升与抑制功能反应时变化值（ $r = 0.394$, $p = 0.023 < 0.05$ ）两两相关均具有显著相关性；（4）正念水平提升对手机成瘾指数下降的预测作用显著（ $B = 1.199$, $t = 4.1892$, $p = 0.0002 < 0.01$ ），且当放入中介变量后，正念水平提升对手机成瘾指数下降的直接预测作用依然显著（ $B = 0.716$, $t = 3.1968$, $p = 0.033 < 0.05$ ）。正念水平提升对抑制功能变化的预测作用显著（ $B = 0.283$, $t = 2.388$, $p = 0.023 < 0.05$ ），抑制功能提高对手机成瘾指数下降的正向预测作用也显著（ $B = 1.7081$, $t = 5.575$, $p = 0.000 < 0.01$ ）；执行功能中抑制功能的变化在正念水平提升影响手机成瘾下降中起部分中介作用，其直接效应（0.716）和中介效应（0.483）分别占总效应（1.199）的 59.72%、40.28%。**研究结论：**8 周正念太极拳干预可改善大学生手机成瘾情况和正念水平，以及执行功能中抑制功能、刷新功能和转换功能。手机成瘾指数变化与抑制功能变化、刷新功能变化和转换功能变化具有正相关关系，而正念水平变化仅与抑制功能变化具有相关关系。正念水平提升不仅能够直接预测手机成瘾指数降低，而且能够通过抑制功能变化的中介作用来预测手机成瘾指数下降，抑制功能提升可能是 8 周正念太极拳干预

前后, 正念水平提升改善手机成瘾情况的中介作用, 该研究为手机成瘾大学生采用合理采用运动手段提供了理论和实践基础。

关键词: 正念; 正念太极拳; 手机成瘾; 执行功能; 大学生

Study on the effect of mindfulness Taijiquan on improving mobile phone addiction behavior and inhibiting function of college students

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Abstract: Research purpose: mobile phone addiction (MPA) refers to an addictive behavior in which excessive use of mobile phones under the premise of non-substance addiction causes adverse physiological and psychological consequences to individuals, which is manifested by strong craving for mobile phones, loss of control, psychological dependence and impaired life function. The high prevalence rate of MPA in Chinese college students is 21.3%. At present, the intervention research of MPA is still in the stage of theoretical development, mainly focusing on cognitive therapy and exercise therapy. As a positive personality trait, mindfulness can influence college students' mobile phone addiction. The reason may be that individuals with a high level of mindfulness have a higher level of attention, are more likely to pay attention to current activities, reduce individual redundancy and increase the control of negative thinking, and ultimately improve the overall cognitive ability. Mindfulness Tai Chi intervention is helpful to improve addictive behaviors such as Internet addiction and drug addiction and improve executive function. There is growing evidence that both acute and long-term mindful tai chi interventions can improve executive function and cognitive ability in different populations. Executive function is more closely related to phone addiction. Of these, inhibitory function, which enables an individual to focus on task-relevant information and suppress irrelevant information, is most directly associated with a person's addictive or health behavior, but the relationship between these variables remains unclear. The purpose of this study was to explore the effects of 8-week mindful Tai Chi intervention on mobile phone addiction, level of mindfulness, executive function and various sub-functions of college students, and to explore the possible mechanism of improving mobile

phone addiction in college students through mindful Tai Chi intervention. **Research methods:** In this study, students from a university in Beijing were selected as the research subjects, and those with scores higher than 40 points were selected by using the mobile phone Addiction Index (MPAI) scale. Cardiovascular diseases, respiratory diseases, bone and joint diseases, depression and anxiety disorders were excluded. Finally, 66 subjects with an average age of 18 to 21 were included in the study. They were randomly divided into control group (33 people) and experimental group (33 people). The control group maintained the normal level of physical activity without additional intervention, while the experimental group received 8 weeks of mindfulness tai Chi intervention. The Tai Chi part of the intervention used was based on Yang's Tai Chi movements, while the mindfulness part included mindfulness no-extremity post and soothing and soft music to guide the practitioners to focus on themselves and return to inner peace. The exercise time was 40min each time. Among them, the non-pole pile exercise with mindfulness guidance language was 5min, the eight-style Tai Chi exercise was 30min (4min*6 sets, 1min interval between groups), and the relaxation part of the non-pole pile with music was 5min, and the exercise frequency was 3 times a week. The mobile phone addiction Scale (MPAI) developed by Liang Yongchi was used to evaluate the situation of mobile phone addiction before and after the intervention, and the mindfulness Attention Awareness Scale (MAAS) prepared by Brown and Ryan in 2003 was used to evaluate the level of mindfulness before and after the intervention. The executive function test tool was used to evaluate the executive function, including Flanker task (suppression function), 2-back task (refresh function) and More-odd shifting task (transformation function). The test indexes were reaction time (milliseconds) and correct rate (%). 2 (time: pre-test and post-test) \times 2 (group: experimental group and control group) was used for repeated measurement ANOVA, Pearson was used for correlation analysis between variable quantities, and Model4, a new mediation effect program proposed by Wen Zhonglin et al., was used for mediation effect test. **The results were as follows:** (1) Cell phone addiction ($t = -0.110$, $P = 0.913 > 0.05$), mindfulness level ($t = 0.883$, $P = 0.381 > 0.05$) and subfunctional inhibition of executive function (correct rate $t = -0.861$, $P = 0.393 > 0.05$; Reaction time $t = -0.876$, $P = 0.384 > 0.05$), refresh function (correct rate $t = -0.448$, $P = 0.656 > 0.05$; Reaction time $t = -0.046$, $P = 0.963 > 0.05$) and conversion function (correct rate $t = 1.165$, $P = 0.248 > 0.05$; There was no significant difference in $t = 0.046$, $P = 0.963 > 0.05$), which showed homogeneity. (2) There was a

significant difference in mobile phone addiction index between the experimental group and the control group after 8-week mindfulness tai Chi intervention ($F = 6.167, P = 0.016 < 0.05$), and there was a significant difference in mindfulness level between the experimental group and the control group after 8-week mindfulness Tai Chi intervention ($F = 4.146, P = 0.046 < 0.05$) and the sub-functional levels of executive function in the post-test experimental group and the control group, including the accuracy rate of inhibitory function ($F = 15.466, P = 0.000 < 0.01$), the accuracy rate of inhibitory function response ($F = 13.330, P = 0.001 < 0.01$), and the accuracy rate of refreshing function ($F = 0.405, P = 0.527 > 0.05$), refresh function response ($F = 1.078, P = 0.303 > 0.01$) and conversion function accuracy ($F = 12.474, P = 0.001 < 0.01$);(3) Before and after mindfulness Tai Chi intervention, the decrease of mobile phone addiction index was correlated with the change value of inhibitory function response ($r = 0.756, P=0.000 < 0.01$), the change value of refreshing function response ($r = 0.035, P=0.045 < 0.05$) and the change value of switching function response ($r = 0.397, P=0.045 < 0.05$). $P=0.022 < 0.05$ pairwise correlation was significant; There was significant correlation between the increase of mindfulness level and the change value of inhibitory functional response ($r = 0.394, P=0.023 < 0.05$).(4) The improvement of mindfulness level had a significant predictive effect on the decline of mobile phone addiction index ($B = 1.199, t=4.1892, p=0.0002<0.01$), and the direct predictive effect of the improvement of mindfulness level on the decline of mobile phone addiction index was still significant after adding the intermediary variables ($B = 0.716, t =3.1968, p=0.033<0.05$). The improvement of mindfulness level was significant in predicting the change of inhibitory function ($B=0.283, t = 2.388, p=0.023<0.05$), and the improvement of inhibitory function was also significant in predicting the decline of mobile phone addiction index ($B= 1.7081, t = 5.575, p= 0.000<0.01$). The change of inhibitory function in executive function played a partial mediating role in the influence of the improvement of mindfulness level on the decline of mobile phone addiction, and its direct effect (0.716) and intermediary effect (0.483) accounted for 59.72% and 40.28% of the total effect (1.199), respectively.**Conclusion:** 8-week mindful Taijiquan intervention can improve the mobile phone addiction and the level of mindfulness, as well as the inhibition function, refresh function and conversion function in the executive function. The change of mobile phone addiction index was positively correlated with the change of inhibitory function, refresh function and conversion function, while the change of mindfulness level was only correlated with the change of

inhibitory function. The improvement of mindfulness level can not only directly predict the decrease of mobile phone addiction index, but also predict the decrease of mobile phone addiction index through the mediating effect of inhibition function change. The improvement of inhibition function may be the mediating effect of the improvement of mindfulness level before and after the 8-week mindfulness Tai Chi intervention. This study provides theoretical and practical basis for mobile phone addicted college students to adopt reasonable exercise means.

Key words: mindfulness, Mindful Tai Chi, Mobile phone addiction, Executive function, College student