



基于健康信念模式的智能健康教育在颈椎病术后 恐动症患者中的效果研究

刘欢^{1,2}, 肖倩^{1△}, 段洪超², 吴浩², 张雷², 张海洋², 刘慧敏², 李春媛²

1. 首都医科大学护理学院(北京 100069); 2. 首都医科大学宣武医院 神经脊柱中心(北京 100053)

【摘要】目的 探究基于健康信念模式的智能化健康教育在颈椎病术后恐动症患者中的应用效果。**方法** 针对单中心神经脊柱中心前路颈椎间盘切除减压融合术,并在术后存在恐动症的患者,开展前瞻性队列研究,由患者自愿选择是否接受智能健康教育干预治疗,将患者分为对照组和智能化教育组,从术后第2天进行干预。智能化教育组从术后第2天开始,依托微信小程序进行智能化教育,该小程序以健康信念模式作为理论框架,以患者问题-需求-导向-实践-反馈的思路进行设计,共分为4个板块(知识、智能锻炼、克服障碍、分享互动),包括提醒功能、趣味锻炼跟练功能、监测与记录功能。对照组从术后第2天开始,采用“图文手册+微信群提醒”的健康教育方式。分别于出院前、术后3个月对两组患者进行问卷调查。两组比较的主要结局指标:恐动程度;次要结局指标包括:功能锻炼依从性(功能锻炼依从性量表)、疼痛程度(Visual Analogue Scale评分)、颈椎功能障碍程度(颈椎残障指数)、生活质量(通过quality of life short form 12量表,主要评定心理健康得分和生理健康得分)等方面的差异。**结果** 共纳入112例患者,108例患者完成了随访。最终智能化教育组53例,对照组55例。患者均未发生运动相关损伤。出院时两组间主要结局指标和次要结局指标差异无统计学意义。术后3个月,智能化教育组恐动程度(25.72±3.90)低于对照组(29.67±6.16),差异有统计学意义($P<0.05$)。智能化教育组的疼痛程度[中位数(P_{25} , P_{75})] [0(0, 0)] 低于对照组 [1(1, 2)] ($P<0.05$), 功能锻炼依从性(63.87±7.26 vs. 57.73±8.07, $P<0.05$)、心理健康(40.78±3.98 vs. 47.78±1.84, $P<0.05$)、身体健康(43.16±4.41 vs. 46.30±3.80, $P<0.05$)均优于对照组,差异有统计学意义。颈椎功能障碍程度[中位数(P_{25} , P_{75})] [1(1, 2) vs. 3(2, 7), $P>0.05$], 两组间差异无统计学意义。**结论** 基于健康信念模式的智能化健康教育,可有助于降低颈椎病术后恐动症患者的恐动程度且改善预后。

【关键词】 智能化 健康信念模式 健康教育 颈椎病 恐动症

Effect of Intelligent Health Education Based on Health Belief Model on Patients With Kinesophobia After Surgical Treatment of Cervical Spondylosis LIU Huan^{1,2}, XIAO Qian^{1△}, DUAN Hongchao², WU Hao², ZHANG Lei², ZHANG Haiyang², LIU Huimin², LI Chunyuan². 1. School of Nursing, Capital Medical University, Beijing 100069, China; 2. Spine Center, Xuanwu Hospital, Capital Medical University, Beijing 100053, China

△ Corresponding author, E-mail: julia.xiao@163.com

【Abstract】 Objective To explore the application effect of intelligent health education based on the health belief model on patients with postoperative kinesophobia after surgical treatment of cervical spondylosis. **Methods** A prospective cohort study was conducted with patients who underwent anterior cervical discectomy, decompression, and fusion surgery with a single central nerve and spine center, and who had postoperative kinesophobia, ie, fear of movement. The patients made voluntary decisions concerning whether they would receive the intervention of intelligent health education. The patients were divided into a control group and an intelligent education group and the intervention started on the second day after the surgery. The intelligent education group received intelligent education starting from the second day after surgery through a WeChat widget that used the health belief model as the theoretical framework. The intelligent health education program was designed according to the concept of patient problems, needs, guidance, practice, and feedbacks. It incorporated four modules, including knowledge, intelligent exercise, overcoming obstacles, and sharing and interaction. It had such functions as reminders, fun exercise, shadowing exercise, monitoring, and documentation. Health education for the control group also started on the second day after surgery and was conducted by a method of brochures of pictures and text and WeChat group reminder messages. The participants were surveyed before discharge and 3 months after their surgery. The primary outcome measure compared between the two groups was the degree of kinesophobia. Secondary outcome measures included differences in adherence to functional exercise (Functional Exercise Adherence Scale), pain level (Visual Analogue Scale score), degree of cervical functional impairment (Cervical Disability Index), and quality of life (primarily assessed by the Quality of Life Short Form 12 [SF-12] scale for

psychological and physiological health scores). **Results** A total of 112 patients were enrolled and 108 patients completed follow-up. Eventually, there were 53 cases in the intelligent education group and 55 cases in the control group. None of the patients experienced any sports-related injuries. There was no statistically significant difference in the primary and secondary outcome measures between the two groups at the time of discharge. At the 3-month follow-up after the surgery, the level of kinesophobia in the intelligent education group (25.72 ± 3.90) was lower than that in the control group (29.67 ± 6.16), and the difference between the two groups was statistically significant ($P < 0.05$). In the intelligent education group, the degree of pain (expressed in the median [25th percentile, 75th percentile]) was lower than that of the control group (0 [0, 0] vs. 1 [1, 2], $P < 0.05$), the functional exercise adherence was better than that of the control group (63.87 ± 7.26 vs. 57.73 ± 8.07 , $P < 0.05$), the psychological health was better than that of the control group (40.78 ± 3.98 vs. 47.78 ± 1.84 , $P < 0.05$), and the physical health was better than that of the control group (43.16 ± 4.41 vs. 46.30 ± 3.80 , $P < 0.05$), with all the differences being statistically significant. There was no statistically significant difference in the degree of cervical functional impairment between the two groups (1 [1, 2] vs. 3 [2, 7], $P > 0.05$). **Conclusion** Intelligent health education based on the health belief model can help reduce the degree of kinesophobia in patients with postoperative kinesophobia after surgical treatment of cervical spondylosis and improve patient prognosis.

【Key words】 Intelligent Health belief model Health education Cervical spondylopathy Kinetophobia

前路颈椎椎间盘切除融合术(anterior cervical decompression and fusion, ACDF)作为治疗颈椎病最常用的手术方式在临床治疗中被广泛应用^[1]。据报道,50%以上的颈椎病术后患者因担心内固定物移位、疼痛等原因害怕做颈部活动,康复锻炼依从性较差,这种由生理-心理-社会因素造成的恐动现象被称为恐动症^[2]。长期处于恐动状态,会造成肢体残余痛,严重者会发生废用综合征。传统健康教育在展示抽象知识方面不够形象,在患者锻炼过程中难以进行持续性指导,尤其是以传统文字为主的健康教育材料难以适合老年人的阅读能力和习惯,健康教育的效果难以达到和维持理想的程度。微信小程序作为“互联网+健康教育”的一种形式,具有方便快捷、操作简单等特点,在多个护理领域应用,进而提高患者自我管理能力和健康信念模式^[3-4](health belief model, HBM)作为健康教育的指导框架,被应用于多个慢病领域,通过知识传播和促进行为改变,进而提高患者生活质量。目前国内尚缺乏针对颈椎病术后人群进行智能化健康教育相关研究,本研究基于HBM,设计智能化小程序,探讨其对颈椎病术后患者恐动程度及预后的改善效果,为颈椎病术后恐动症患者健康教育提供借鉴。

1 对象与方法

1.1 研究对象

本研究通过首都医科大学宣武医院伦理审查委员会审查([2022]227号),纳入2021年10月-2022年12月单中心神经脊柱中心行前路颈椎减压融合术、并在术后存在恐动症的患者连续病例112例。纳入标准为:①年龄 \geq

18岁;②符合颈椎病的诊断标准^[6],初次行ACDF的患者,手术节段 ≤ 2 个;③术后第2天恐动症TSK(Tampa Scale of Kinesiophobia)评分 > 37 分;④能够并且自愿参与本研究,并签署书面知情同意书。排除标准为:①合并颈部其他疾病患者且不能进行功能锻炼患者;②恶性肿瘤患者或伴有脑、心、肺等重要脏器损伤者;③伴有精神病患者、失明、失聪、认知障碍者;④因各种原因不能参与本研究。由患者自愿选择是否接受智能健康教育干预治疗,术后随访3个月。最终,108例患者完成随访,其中智能化教育组53例,对照组55例。

1.2 研究方法

研究团队结合颈椎前路手术加速康复专家共识^[7]、HBM理论及相关文献^[8-11]制定初稿。根据专家意见对方案进行反复修改。选取临床20例患者进行预实验,根据患者的意见进行内容的补充与修改,最终形成终稿。

基于HBM的5个因子,即感知到疾病的易感性,感知到疾病的严重性,感知到行动的益处,感知到行动的障碍,自我效能5个方面,其核心内容包含信念改变带来的行动变化。因此,依托HBM理论框架,设计一款智能化健康教育方案的微信小程序,将多元运动方案通过视频、音频、文字、图片的形式展示。小程序包括以下功能:①提醒功能;②趣味锻炼跟练;③监测与记录。小程序共分为4个板块:知识、智能锻炼、克服障碍、分享互动。知识板块根据HBM模式中的因子——易感性及严重性:向患者讲解什么是恐动症,恐动症的发生概率、原因及危害。智能锻炼板块根据HBM模式中的因子——行动益处:向患者介绍预防恐动症或减轻恐动程度的方法,并告知患者采取行为后带来的益

处。研究团队改变了以往枯燥的颈椎操, 改编了一款智能且趣味性强的颈椎操, 以便患者使用。颈椎操除了视频展示外, 在视频页面的右下角加入卡通人物形象进行语音指导。卡通人物可爱灵动、色彩鲜艳容易吸引注意力^[12]。颈椎操包括两部分内容: 颈部肌肉拉伸放松练习、肩背肌肉拉伸放松练习。克服障碍板块使患者知觉到预防恐动症过程中的障碍, 研究者向患者介绍恐动症预防过程中的一些不可干预和可干预因素。分享互动板块促进恐动症患者提升自我效能感。

1.2.1 基于HBM智能化健康教育组干预方法

研究人员在术后第2天进行入组患者的筛选, 并由研究成员介绍微信小程序的使用方法及注意事项, 分别在出院时、术后3个月进行数据收集。

1.2.2 对照组干预方法

采用传统的讲授方式, 由责任护士在术后第2天进行健康教育的讲解并进行动作示范, 健康教育后要求患者进行相关内容的复述及演示, 以保证教育内容的理解和实施, 同时发放健康教育手册, 包括分解动作图例及注意事项。干预周期为3个月。分别在出院时、术后3个月进行数据收集。

1.3 结局指标

主要结局指标: 恐动症通过恐动症评分表测评^[13-14]。

次要结局指标分别为: 功能锻炼依从性通过功能锻炼依从性量表进行测评^[15]; 疼痛通过Visual Analogue Scale(VAS)评分^[16]量表进行疼痛评分, 疼痛程度划分为轻度(VAS 1~3分)、中度(VAS 4~6分)、重度(VAS 7~10分); 颈椎功能通过颈椎残障指数进行颈椎功能测评^[17]; 生活质量通过QoL(quality of life)简明版(short form 12, SF-12)进行生活质量的测评^[18], 主要评定心理健康得分(SF-MCS)和生理健康得分(SF-FCS)。

1.4 数据的收集与质量控制

入组时收集的一般资料包括年龄、性别、职业、文化程度、婚姻状况、病程、既往史、疼痛年限、疼痛程度、骨质疏松程度、是否了解颈椎病手术治疗方式、是否了解恐动症知识。分别于出院前、干预3个月后进行问卷调查。对参与研究者进行全员培训, 规范统一指导语对患者进行指导。微信小程序的功能逐一对患者进行介绍, 教会患者如何进行搜索且进行操作。

1.5 统计学方法

采用SPSS25.0统计软件进行数据分析, 符合正态分布的计量资料使用 $\bar{x} \pm s$ 表示, 组间比较采用两独立样本 t 检验, 不符合正态分布采用中位数(P_{25}, P_{75})表示, 组间比较采用秩和检验; 定性资料使用频数和百分率表示, 组间比

较采用卡方检验。 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 一般资料

研究过程中共有4例患者退出研究, 其中2例不愿继续参与, 2例因手机故障。最终智能化教育组53例、对照组55例完成3个月干预。患者均未发生运动相关损伤。两组一般资料的比较见表1, 性别比、年龄段分布、VAS评分等基线数据两组间差异无统计学意义。

2.2 主要结局指标

出院时两组患者恐动症得分差异无统计学意义($P > 0.05$); 术后3个月, 智能化教育组恐动程度低于对照组, 差异有统计学意义($P < 0.05$), 见表2。

2.3 次要结局指标

出院时两组患者在功能锻炼依从性、疼痛、颈椎功能、生活质量得分(心理健康得分、身体健康得分)方面的比较无统计学意义($P > 0.05$); 两组患者在术后3个月功能锻炼依从性、疼痛、生活质量(心理健康得分、身体健康得分)等方面得分均有统计学意义($P < 0.05$), 两组在颈椎功能方面差异无统计学意义($P > 0.05$), 见表2。

3 讨论

3.1 实施基于HBM的智能化教育方案有助于降低颈椎病术后恐动症水平

本研究基于前期的现状调查结合患者自身需求, 设计的智能化健康教育工具一定程度上降低了患者的恐动水平。本研究表明, 智能化教育组3个月后恐动症分数均低于对照组, 差异有统计学意义($P < 0.05$), 提示基于HBM的智能化健康教育更有利于颈椎病术后恐动症患者降低恐动程度。有学者^[19]指出, 常规的健康教育可使患者理解运动锻炼的重要性, 降低恐动程度, 但在实践中缺少针对性, 康复锻炼依从性不高、内容冗杂且容易遗忘, 本研究基于HBM理论框架, 从该理论的5个因子入手, 依托微信小程序, 结合患者心理和实际需求, 向患者讲解恐动症的定义、诱因、危害、可干预和不可控因素, 预防恐动症行为过程中的障碍和采取行为的益处等, 转变患者的信念促使行为转变, 这也是HBM理论的核心价值观。最终降低患者的恐动程度。

3.2 实施基于HBM的智能化教育方案有助于颈椎病术后恐动症患者改善预后

本研究显示, 干预3个月后, 基于HBM的智能化教育组的依从性、疼痛程度、生活质量均优于对照组, 可见实施基于HBM的智能化教育方案有助于颈椎病术后恐动

表 1 两组一般资料比较
Table 1 Comparison of general data between the two groups

Factor	Control group/ <i>n</i> =55, case (%) or $\bar{x} \pm s$	Intelligent education group/ <i>n</i> =53, case (%) or $\bar{x} \pm s$	<i>t</i> or χ^2	<i>P</i>
Sex			2.964	0.085
Male	35 (63.6)	25 (47.2)		
Female	20 (36.4)	28 (52.8)		
Age/yr.			11.643	0.071
≤60	40 (72.7)	24 (45.3)		
61-70	13 (23.6)	17 (32.1)		
≥71	2 (3.6)	12 (22.6)		
Marital status			0.001	0.979
Married	54 (98.1)	52 (98.1)		
Spinsterhood	1 (1.9)	1 (1.9)		
Education attainment			1.721	0.423
Primary school/middle school	16 (29.1)	19 (35.8)		
High school/junior college	39 (70.9)	33 (62.3)		
Bachelor degree or postgraduate education	0	1 (1.9)		
Course of disease			1.087	0.780
<3 months	14 (25.5)	11 (20.8)		
3 months-3 years	22 (40.0)	24 (45.3)		
>3 years	19 (34.5)	18 (33.9)		
Occupation			0.567	0.753
Farmer	11 (20.0)	13 (24.5)		
Employee of an insititution/enterprise	35 (63.6)	30 (56.6)		
Unemployed	9 (16.4)	10 (18.9)		
Past history			5.799	0.122
High blood pressure	17 (30.9)	15 (28.3)		
Diabetes mellitus	7 (12.7)	8 (5.1)		
Coronary heart disease	0	5 (9.4)		
Other	31 (56.4)	25 (47.2)		
History of pain			2.172	0.537
<1 year	29 (52.7)	21 (39.6)		
1-3 years	14 (25.5)	15 (28.3)		
>3 years	12 (21.8)	17 (32.1)		
Pain degree			4.591	0.102
Mild	27 (49.1)	17 (49.1)		
Moderate	23 (41.8)	25 (47.2)		
Severe	5 (9.1)	11 (20.8)		
The patient understands cervical spondylosis			0.266	0.606
Yes	38 (69.1)	39 (73.6)		
No	17 (30.9)	14 (26.4)		
The patient understands kinesophobia			0.345	0.557
Yes	9 (16.4)	11 (20.8)		
No	46 (83.6)	42 (79.2)		
Pre-op TSK	46.04±5.90	44.25±5.12	1.682	0.567
Pre-op VAS	1.58±1.99	1.89±1.59	-0.879	0.299
Pre-op NDI	13.75±8.18	14.58±8.17	-0.534	0.274

Pre-op: pre-operation; TSK: Tampa Scale of Kinesiphobia; VAS: visual analogue scale; NDI: neck disability index.

症患者改善预后。分析原因可能是:首先,智能化的小程序集视频、音频、图片于一体,患者可以随时获取自己所需要的知识,降低恐动水平,克服恐动心理,从而减轻疼痛感,提高锻炼依从性,进而促进颈椎功能的恢复。其次,短信提醒、微信群内互动,为患者解答困惑,从而方便医患沟通。在康复锻炼过程中的问题能够及时得到解

决,增加患者战胜疾病的信心,进一步提高锻炼依从性,促进康复。最后,监督与每日打卡板块可以及时了解患者的运动状态及问题,及时纠正与提醒,对锻炼依从性差的患者及时给予干预,杜绝懈怠行为,从而提高功能锻炼依从性,减轻由于恐动状态带来的肩颈部酸胀、疼痛感,为颈椎功能恢复奠定了基础。术后3个月两组患者在颈

表 2 两组患者在恐动症、功能锻炼依从性、疼痛、颈椎功能、生活质量得分方面的比较

Time	Group	n	Score ($\bar{x} \pm s$ or median [P ₂₅ , P ₇₅])					
			TSK	FECF	VAS	NDI	SF-MCS	SF-PCS
At discharge	Intelligent education group	53	41.64±6.71	49.98±8.10	1 (1, 1)	1 (1, 2)	40.16±7.76	39.92±6.79
	Control	55	44.62±5.42	48.41±7.07	1 (1, 1)	11 (7, 17)	41.83±8.60	38.78±7.21
	t/Z		2.54	1.07	-1.80	-1.48	-0.42	0.85
	P		0.313	0.29	0.07	0.14	0.372	0.805
3 months post surgery	Intelligent education group	53	25.72±3.90	63.87±7.26	0 (0, 0)	1 (1, 2)	40.78±3.98	43.16±4.41
	Control	55	29.67±6.16	57.73±8.07	1 (1, 2)	3 (2, 7)	47.78±1.84	46.30±3.80
	t/Z		3.97	4.15	-1.85	-1.27	-11.75	-3.95
	P		0.01	0.01	0.04	0.20	0.01	0.04

TSK: Tampa Scale of Kinesiophobia; FEC: functional exercise compliance; NDI: neck disability index; VAS: visual analogue scale; SF-MCS: short form-mental component summary; SF-PCS: short form-physical component summary.

椎功能方面差异无统计学意义, 分析原因可能与脊髓长期受到压迫, 然而脊髓功能的恢复需要较长时间, 短期只能在部分功能方面存在差异, 进而需要更长时间的随访研究以便获得两组患者在颈椎功能方面的差异性改变。本研究与喻专容等^[20]的研究结果基本一致, 说明了微信小程序的可及性、实用性、便捷性。

本研究没有有效控制混杂因素的影响, 研发的小程序针对患者群体, 尚不能做到个体化, 今后小程序的功能方面可以考虑添加虚拟现实技术, 让患者进一步提高自我效能, 增强功能锻炼依从性。

* * *

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Author Contribution LIU Huan is responsible for conceptualization, data curation, formal analysis, and writing--original draft. XIAO Qian is responsible for conceptualization and supervision. DUAN Hongchao and ZHANG Lei are responsible for supervision. WU Hao is responsible for conceptualization. ZHANG Haiyang, LIU Huimin, and LI Chunyuan are responsible for resources. All authors consented to the submission of the article to the Journal. All authors approved the final version to be published and agreed to take responsibility for all aspects of the work.

利益冲突 所有作者均声明不存在利益冲突

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