

城市体力活动相关建成环境的评价工具进展

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【关键词】 建成环境; 评价; 体力活动

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体力活动水平是影响个体健康重要的、可干预的因素之一^[1]。经常进行体力活动能够有效减少诸多慢性病,如心血管疾病等发病风险^[2,3]。建成环境(built environment)指人为建设改造的各种建筑物、场所,尤其指那些可以通过政策、人为行为改变的环境^[4]。近年来,国外研究者越来越关注建成(物理)环境对个体体力活动水平的影响^[5],以健康生态学模型为理论指导,开展了一系列建成环境与个体体力活动之间的关联研究,在研究内容和方法学上做了有益的探讨和拓展。国外的多项研究结果发现两者之间存在关联^[6]。

在探讨建成环境与体力活动关系的研究中,用于评价建成环境和体力活动水平的测量工具是决定研究真实性与可

靠性的关键技术环节。本文对近 10 年来国外评价城市建成环境时所使用的问卷与量表的种类、维度、特点及其应用进行简要介绍。

评价建成环境的方法主要有 3 种:①主观评价或自报法:通过问卷调查了解研究对象对其周边一定范围内建成环境的主观感知情况;②客观扫描法:由观察员借助量表等扫描工具,亲自步行或驾车穿过某一街道、公园、运动设施等,并按照既定的标准对该场所或设施进行评价;③利用地理信息系统(GIS)对现有客观地理数据进行分析:通过对现有的地理数据(可能来源包括城市规划局、国家地理信息系统或利用全球卫星定位系统自行测量等得到的地理数据)进行各个图层的叠加综合后,分析空间数据的特征并挖掘其属性之间的关联。由于利用 GIS 进行评价建成环境时较少涉及问卷或量表,故在本文中不作详述。

1. 主观评价工具:在对国外研究者使用过的建成环境评价问卷进行比较分析和归纳总结的基础上,我们将评价与体力活动相关的建成环境时通常涉及的调查维度归纳为 10 个方面:人口密度、土地综合利用情况、街道连通性、体力活动相关设施、设施的可达性、美观程度、安全度、障碍、服务和其他。表 1 中总结了 11 个成年人问卷的基本信息和涉及的调查维度。

Saelens 等^[7]于 2002 年共同开发的 NEWS 量表,由于其较好的信度和效度成为此类问卷中应用最多的一个,主要用

表 1 主观评价建成环境相关问卷基本信息和涉及维度

问卷/相关研究	基本信息			涉及维度							
	题目数量	人口密度	土地综合利用	街道连通性	周边设施(步行/自行车)	可及性/可达性	美观度	障碍	周边安全程度(交通/犯罪)	服务	其他
NEWS ^[7]	68	✓	✓	✓	✓	✓	✓	✓	✓		
NEWS-A ^[8]	54	✓	✓	✓	✓	✓	✓	✓	✓		
IPS(PANES) ^[9,10]	核心 7+推荐 4+可选 6	✓		✓	✓	✓	✓		✓		
San Diego Instrument ^[11]	43				✓						✓
San Louis Instrument ^[12]	30				✓	✓			✓		✓
South Carolina Instrument ^[13]	26					✓		✓			✓
Perceived Neighborhood Quality Index ^[14]	15								✓		✓
Perceived Walking Environment Study ^[15]	8							✓	✓		✓
Perceived Physical Activity Environment Study ^[16]	51						✓	✓	✓		✓

注: NEWS: Neighborhood Environment Walkability Scale; NEWS-A: Abbreviated Neighborhood Environment Walkability Scale; IPS: International Prevalence Study (IPS) on Physical Activity (IPAQ-E), 现称为 Physical Activity Neighborhood Environment Scale (PANES)

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于评价居民对社区周边利于步行或骑自行车相关建成环境的主观感受。IPAQ-E (PANES)的发展借鉴了NEWS和NEWS-A量表的维度与条目,同样对步行或骑车相关的周边环境进行了评估。但是,NEWS和NEWS-A中只涉及最普遍的体力活动方式——步行或骑自行车,忽略了其他的体力活动形式,尤其是丰富多彩的休闲性体力活动。而PANES根据Sallis^[17]于2008年进行的Active Where研究,将问卷中的娱乐设施种类增加到14种,包括篮球、足球或网球等运动场地、游泳池(馆)、步行(跑)道、对公众开放的有娱乐体育设施的学校、小型公园、有健身器材的公共游乐场所等;在讨论建成环境与休闲性体力活动关系中显得更为全面。South Carolina问卷还涉及了可能会阻碍体力活动的相关内容。总体而言,NEWS、NEWS-A涉及的维度更为全面,IPAQ-E (PANES)其次,但IPAQ-E (PANES)设计条目数少,更适用于公共卫生监测而非科学研究。

应用主观评价工具进行研究时,需要注意以下问题:

第一,主观评价法的问卷中部分条目可能会存在回忆偏差,即受访个体对于其周边建成环境的感知是基于其以往经验形成的判断,这种判断的标准会因受访者的年龄、性别、体力活动水平或其他个体因素的不同而产生差异,从而导致某一部分的调查结果与实际情况不一致。如被访者对其周边体力活动相关设施的距离感知可能与真实情况有差别,或被访者对周边环境对体力活动支持度的感知可能与真实情况有区别。但是在应用于大规模人群调查时,主观评价法仍然是可行性最高的方法。

第二,进行主观评价要注意周边环境的范围定义,现多采取2种方法:①根据市政资料和/或GIS数据直接确定目标区域或社区^[7]。②以受访者居住地为中心,确定一定的半径范围。有的研究定义半径为距离受访者10~15 min步行的范围^[10,18];也有的直接以0.5英里为范围进行定义^[13]。还有研究者建议半径的定义可以根据体力活动指南中推荐的最

低活动水平计算范围,如按每天至少30 min中等强度体力活动这个建议计算,可将个体的周边环境定义为半径是15 min步行的范围,保证往返可达到指南的推荐活动量^[9]。按照平均60~100 m/min的成年人平均步行速度计算,即将半径定义为900~1500 m比较合适。周边环境范围应避免定义过大。有研究显示^[13],定义的范围减小,可以增加主观判断与客观现实的一致性。

2. 客观扫描工具:在众多的扫描工具中,有对社区整体环境进行评价的综合性问卷(如analytic audit tool等);有对具体体力活动行为相关环境进行评价的问卷,尤以步行和骑自行车为多(如systematic pedestrian and cycling environment scan, SPACES);也有针对特定场所进行扫描的问卷(workplace outdoor environment audit, BRAT-direct observation, BRAR-DO);还有针对特殊人群体力活动环境的问卷(senior walking environment audit tool-SWEAT、environmental supports for people with disabilities)等。本文就综合性及体力活动相关的扫描量表进行了总结。

表2中归纳了常用的综合性及体力活动相关的扫描问卷的基本信息和主要维度。综合性问卷中,出于对效度检验结果和工作量的双重考虑^[21], analytic audit tool成为了其中较好的基础性量表,而且其覆盖的维度更全面。而针对步行与骑自行车环境扫描量表中,SPACES覆盖维度更为全面,且以其容易操作和较高信度的特点被多数研究所采用^[31,32]。PARA量表则主要适用于对娱乐性体力活动场所及设施进行评价。

应用客观扫描法评价建成环境时,由于不依赖受访者的回忆,所以结果相对准确可靠,通过现场扫描等方式也容易将研究做到全面细致。但是这种方法可能的局限性是现场扫描工作量大。因此,如果将客观扫描适当的配以GIS客观数据分析,可一定程度上减少工作量,但是要注意现成的GIS数据通常是由其他单位而非研究者自身收集的,因此需

表2 客观评价建成环境相关问卷基本信息和涉及维度

问卷/相关研究	基本信息		涉及维度								
	题目数量	所需时间	总体评价	居住用地使用情况	非居住用地使用情况	美观度/舒适度	安全感	目的地	娱乐设施	步行相关设施	自行车相关设施
综合性扫描工具											
SSO ^[20]	126	5~10分钟/街区		√	√	√			√	√	√
Analytic Audit Tool ^[21]	27	10.6分钟/路段		√	√	√	√	√	√	√	√
PIN3 Neighborhood Audit Instrument ^[22]	43	未报告	√	√	√	√	√			√	√
Irvine - Minnesota Inventory ^[123,24]	178	20分钟/路段		√	√	√	√		√	√	√
NALP ^[25]	18	未报告					√	√		√	√
步行/骑自行车扫描工具											
SPACES ^[26]	51	≈20分钟/千米	√			√	√	√		√	√
WABSA ^[27]	16+27	未报告					√			√	√
Sidewalk Assessment Tool ^[28]	5	8~12分钟/路段				√				√	
PEDS ^[29]	36	3~5分钟/400英尺路段					√			√	√
休闲性体力活动扫描工具											
PARA ^[30]	43	10分钟/中等规模场所								√	

注:SSO: Systematic Social Observation; NALP: Neighborhood Active Living Potential; SPACES: Systematic Pedestrian and Cycling Environment Scan; WABSA: Walking and Bicycling Suitability Assessment Form; PEDS: Pedestrian Environment Data Scan Tool; PARA: Physical Activity Resource Assessment Instrument

保证GIS数据的收集过程大致与研究的时间和地理层面相近^[35]。同时,在设计扫描量表时应该注意尽量避免出现过度依赖调查员主观判断的题目。例如,“你如何评价本区域对步行体力活动的吸引程度?”,“你如何评价本区域对步行体力活动的阻碍程度?”,这类问题的信度通常较低^[34]。评价设施质量的问题,选项经常采用等级变量或李克特式量表(如非常好、较好、中等、较差、非常差等),应注意尽量搭配详细的文字和图例配套解释说明,利于调查员形成较为统一的判断。

3. 总结:总的来说,评价体力活动相关的建成环境,今后主要有以下2个发展方向:

(1)主客观测量方法相结合:客观扫描法的结果虽然更加客观、准确,但主观评价法的结果是受试者基于自己的感知得出的结论,而正是这种感知直接决定了受试者参与体力活动的积极性^[33]。有研究显示客观扫描法和主观评价法的结果之间一致性较低^[35]。被调查者对家与目的地间距离估计不准确^[36]、仅根据最近一次体力活动的情况对周边环境进行感知^[37]、故意将周边环境感知为不利于体力活动以作为自己不锻炼的借口^[35]、周边环境范围定义难以两全等原因都可以造成主客观评价结果一致性较差^[38]。同时,由于经常进行体力活动的人群比体力活动缺乏或运动意愿较低的人群对周边建成环境的感知程度更高,可能会导致结果高估建成环境与体力活动的正向关联或得出与事实相悖的结论^[39]。例如由于经常锻炼的人更加清楚周边环境中对体力活动不利的因素有哪些而得出交通拥挤与更高水平体力活动有关的结论^[40]。因此仅应用单一方法通常不能全面反映研究对象周边环境的实际情况。同时应用主观与客观评价方法是十分必要的,两部分信息互为补充并有助于对结果进行阐述。在利用主观调查工具评价期间,可以派出调查员对被调查对象周边环境进行人工客观扫描,或是通过收集调查地点周边的同期GIS数据进行分析以达到主客观方法相结合的目的。

(2)测量工具的统一、改进和开发:应该鼓励研究者利用统一的问卷和操作规范进行调查研究,有利于形成汇总数据,进行合并分析。但是也要注意很多问卷和量表在设计时未进行大规模的国际间人群的信效度评价,问卷不一定在当地的研究人群中仍有较好的信效度,问卷条目也不一定适合当地城市的规划情况。因此,有时需要研究者对问卷进行筛选、做出适应性修改或直接开发新的问卷。例如,Spittaels等^[41]通过文献综述,确定核心问卷以选择维度,对现有研究进行因子分析来筛选条目3个步骤,发展出适应欧洲情况的NEWS问卷。

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