

## 中老年女性骨健康素养问卷研制及信效度检验

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**【摘要】** 目的 旨在编制围绝经期前后女性骨健康素养问卷,检验其信效度,为该问卷在中老年女性人群中的推广提供科学依据。方法 根据WHO欧洲办事处2012年对健康素养的定义,确定问卷的理论框架;然后借鉴国内外骨健康相关研究、通过两轮专家咨询,初步形成骨健康素养问卷。研究对象为上海市城郊7个区的45~65岁社区女性。信度检验采用克隆巴赫 $\alpha$ 系数和分半信度,效度检验包括内容效度、区别效度、会聚效度和结构效度。结果 经过专家多轮讨论删减后形成40个条目的骨健康素养问卷。研究共纳入447名45~65岁社区女性。问卷的Cronbach's  $\alpha$ 为0.763,分半信度为0.793。总问卷与各领域得分之间的相关系数为0.403~0.703,问卷的内容效度较好;问卷的会聚效度与区别效度定标试验成功率分别为57.50%和86.25%;验证性因子分析结果显示,拟合度指数(goodness of fit index, GFI)等指标达到适配标准,结构效度良好。结论 中老年女性骨健康素养问卷具有较好的信效度,可作为中老年女性骨健康素养测量和评价的简易工具。

**【关键词】** 骨质疏松; 健康素养; 信度; 效度; 中老年女性

**【中图分类号】** R195.4 **【文献标志码】** A **doi:** 10.3969/j.issn.1672-8467.2023.04.014

## Reliability and validity of the bone health literacy questionnaire for middle-aged and elderly women

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**【Abstract】** **Objective** To develop a questionnaire for assessing bone health literacy among perimenopausal and postmenopausal women, then evaluate its reliability and validity, and to provide scientific evidence for the application of the questionnaire in the middle-aged and elderly. **Methods** A theoretical framework was developed based on the integrated theoretical model of health literacy proposed by Regional Office for Europe of WHO in 2012. Based on the relevant research on bone health at home and abroad, and through two rounds of expert consultation, a bone health literacy questionnaire was formed.

上海市公共卫生体系建设三年行动计划优秀学科带头人项目(GWV-10.2-XD08);上海市公共卫生体系建设三年行动计划(GWV-9.4)

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网络首发时间:2023-04-03 09:19:19 网络首发地址:https://link.cnki.net/urlid/31.1885.R.20230331.1631.006

The community women aged 45–65 years were investigated in 7 urban and suburban districts of Shanghai. Cronbach's  $\alpha$  and split-half reliability were calculated to evaluate the reliability of bone health literacy questionnaire; content, discriminant, convergent and structural validity were performed to measure the validity of the questionnaire. **Results** A forty-item bone health literacy questionnaire for perimenopausal and postmenopausal women was finalized through expert meetings. A total of 447 women aged 45–65 years from community were investigated for the evaluation. The overall Cronbach's  $\alpha$  of the bone health literacy questionnaire was 0.763 and the split-half reliability was 0.793. The correlation coefficient of each sub-questionnaire with the total questionnaire was 0.403–0.703. The bone health literacy questionnaire had good content validity, with the success rate of calibration experiment of 57.50% and 86.25% respectively. Confirmatory factor analysis showed that the goodness of fit index (GFI) and other indicators reached the adaptation standard, and the structural validity was good. **Conclusion** The questionnaire has good reliability and validity, and can be used as a simple tool to measure and evaluate bone health literacy among middle-aged and elderly women.

**【Key words】** osteoporosis; health literacy; reliability; validity; middle-aged and elderly women

\* This work was supported by Excellent Academic Leader Project of Three-year Action Plan for Public Health System Construction (GWV-10.2-XD08) and Project of Shanghai Three-year Action Plan for Public Health System Construction (GWV-9.4).

骨质疏松症是影响女性晚年生命质量的主要健康问题之一。女性雌激素水平是调控女性骨代谢和骨密度的重要因素,雌激素水平下降是女性发生骨质疏松的主要危险因素。围绝经期及绝经早期的女性因雌激素水平的剧烈波动和急速下降,成为骨质疏松症和骨折的高危人群<sup>[1-2]</sup>。

自美国学者 Simonds 在 1974 年第一次提出了健康素养的概念之后<sup>[3]</sup>,陆续有多位学者开发了健康素养问卷评价工具,以评估受众对相应健康问题的素养水平<sup>[4]</sup>。基于健康素养评价结果开展的人群针对性健康干预,对提高个体的疾病预防和健康管理能力,提升群体生命质量具有重要意义。因此,正确认识骨健康及其相关的营养、运动知识,掌握骨健康问题的主要表现,及时获取相应的健康服务,对保持中老年女性的骨健康水平、降低骨质疏松症发生风险、改善晚年生命质量至关重要。

我国针对人群开展的健康素养研究多采用普适性的《中国公民健康素养调查问卷》,但普适性测评工具缺乏针对性,较难有效反映人群在特定疾病和健康领域的相关知识储备水平以及获取能力,进而也较难在相应人群中开展针对性的评估和健康干预。近年来,陆续有针对高血压、糖尿病以及癌症等特定疾病的健康素养测试工具问世,但经 Embase、Web of Science 和相关中文文献平台以及专业健康素养评估工具数据库检索,尚未发现有成

熟的可用于骨质疏松和骨健康领域的健康素养评估工具。围绝经期和绝经早期女性是骨质疏松症发生的高危人群,处于可采取健康素养干预的窗口期,早期干预将对中老年女性骨健康发挥重要作用。

为了掌握处于骨质疏松高风险且可干预阶段的中老年妇女骨健康素养现状,合理评价其骨健康素养水平,复旦大学公共卫生学院和上海市妇幼保健中心的研究团队,根据 WHO 欧洲区办事处(EU WHO)对健康素养的定义<sup>[5]</sup>,从人们获取、理解、评价和应用健康信息的知识、动机和能力出发,编制了围绝经期及绝经早期女性骨健康素养问卷,并于 2021 年 4—5 月在上海市 45~65 岁中老年女性居民中开展骨健康素养预调查,以评估该问卷的信度和效度。

## 资料和方法

**研究对象** 2021 年 3—6 月,在上海市长宁区、奉贤区、崇明区、宝山区、静安区、金山区和黄浦区等更老年期妇女骨健康示范区开展围绝经期及绝经早期女性骨健康队列建设,招募 45~65 岁社区女性自愿加入骨健康队列,并开展包括骨质疏松症风险评估、运动能力测试、认知评估以及衰弱评分在内的基线调查。纳入标准:(1)45~55 岁围绝经期

女性(未停经或停经不超过一年)以及55~65岁绝经后女性(已停经1年及以上);(2)知情同意,自愿参加。排除标准:(1)不具有完全行为能力者,不能取得知情认可者;(2)失明、失聪、失语等无法完成调查者;(3)患有严重神经和精神系统疾病者。考虑到每一问卷条目至少对应5~10例研究对象,在确保研究设计科学性和方案可行性的基础上,最终纳入符合要求的447名女性为本次问卷评估预调查对象,各区对象数为20~164人。

**问卷设计和编制** 采用2012年WHO欧洲办事处对健康素养的定义<sup>[5]</sup>,以“健康素养整合模型”为理论框架,基于我国社会文化和医疗情况,形成问卷的基本框架,进而参考欧洲健康素养调查量表,构建包含疾病预防、健康促进、医疗服务3个领域和获取、理解、评价、应用4个维度的骨健康素养问卷。借鉴国内外较为成熟的健康素养评估相关工具,先在骨健康临床专家和流行病学专家研讨基础上,建立了包含60个条目的条目池;然后由流行病学、妇幼卫生、健康教育、临床骨质疏松科及营养科等多领域10位专家开展2轮专家评阅和会议讨论,函询的专家来自上海多家机构,专家研究方向涉及不同领域,具有代表性,受邀专家对条目池中的条目逐条评阅后修改完善,在此基础上开展人群预调查。

**预调查反馈和问卷修订** 对447名45~65岁社区妇女完成问卷调查后,综合调查员反馈、对象应答体验和专家意见,再次梳理问卷条目,将“您从哪些渠道获取骨健康方面的信息?”与“如果您是从网络上获取的骨健康方面的信息,那么主要是以下哪些渠道”条目删除,将“您是否有吸烟习惯?”与“如果您有吸烟习惯,为了预防骨质疏松症能戒烟吗?”条目合并,将“您是否有饮酒习惯?”与“如果您有饮酒习惯,为了预防骨质疏松症能戒酒吗?”条目合并,最终形成3个领域4个维度共计40个条目的中老年女性骨健康素养问卷。其中疾病预防相关10个条目,健康促进相关17个条目,医疗服务相关13个条目。问卷的计分方法包括:(1)李克特4级评分的条目,选“非常容易”/“非常赞同”得2分,选“比较容易”/“比较赞同”得1分,其余得0分;(2)单选题,答对得2分,答错得0分;(3)多选题,每个选项均作为判断题,答对得2分,答对部分得1分,其余得0分。所有条目的赋值范围是0~2分。

**问卷信效度评价指标** 将问卷分为医疗服务、疾病预防、健康促进3个内容领域后进行分析。信度评价采用内部一致性信度和分半信度<sup>[6-7]</sup>。其中,分半信度采用奇偶分半的方法评价。效度评价包括:(1)内容效度,以各领域(疾病预防、健康促进和医疗服务)与总问卷之间的相关性进行评估<sup>[7]</sup>;(2)区别效度<sup>[7-8]</sup>,以定标试验对区别效度进行评估,如果问卷条目与所属领域的相关性大于其他领域的相关性,同时差异具有统计学意义,则认为条目的定标试验成功,当定标试验成功率大于80%时,认为区别效度良好;(3)会聚效度,条目与所属领域的相关系数 $>0.4$ 作为会聚效度定标试验,当定标试验成功率 $>80\%$ 时,认为会聚效度良好<sup>[7-8]</sup>;(4)结构效度,通过AMOS 21.0进行验证性因子分析,采用卡方自由度比( $\chi^2/\text{df}$ )、近似误差均方根(root-mean-square error of approximation, RMSEA)、拟合度指数(goodness of fit index, GFI)、增值适配指数(incremental fit index, IFI)和比较拟合指数(comparative fit index, CFI)等进行模型拟合度评价,验证量表的因子结构模型<sup>[9-12]</sup>是否与实际收集的数据相符合,评价模型的适配程度,检验量表的结构效度。

**统计学分析** 使用EpiData 3.0软件建立数据库,采用SPSS 22.0软件对数据进行统计学分析。通过计算3个领域下题目得分之和获得各领域总分。使用临界比值法(critical ratio, CR值)、相关系数法(correlation coefficient)以及内部一致性分析3种筛选方法进行条目筛选。(1)临界比值法<sup>[6-8, 13]</sup>:将问卷总得分前27%的人群分为高分组,其余为低分组,检验两组之间各条目得分差异是否具有统计学意义,若 $\text{CR} < 3$ 或 $P > 0.05$ ,则考虑删除该条目。(2)相关系数法:计算各个条目得分与问卷总分之间的相关性,若相关系数 $< 0.4$ ,则考虑删除该条目。(3)Cronbach's  $\alpha$ 系数法:将问卷条目删除后,总问卷的Cronbach's  $\alpha$ 系数上升。如某条目符合以上3项指标中2项及以上,经项目组讨论后考虑删除。

**质量控制** 调查前,制订调查指南,完成调查员培训,并在现场开展演练。由各区县妇幼保健所专业人员和社区医务人员经过培训和考核合格后担任调查员。调查完成后,由调查员对每份问卷进行逻辑差错和完整性检查,并接受项目团队专人现场质控。问卷由受过培训的医学生完成双人重复

录入,并进行基于Epidata的录入数据一致性检验。

结 果

**人口学特征** 本次调查共发放问卷447份,问卷回收率100%,应答率100%。调查对象年龄为45~65(52.67±5.96)岁,其中99.55%为汉族;调查对象中以在职和已婚人群为主,分别占66.00%和89.93%(表1)。

表1 研究对象社会人口学特征

Tab 1 Socio-demographic characteristics of the subjects

| (n=447)                          |                            |
|----------------------------------|----------------------------|
| Characteristic                   | $\bar{x} \pm s$ or $n(\%)$ |
| Age (y)                          | 52.67 ± 5.96               |
| Ethnic                           |                            |
| Han                              | 445 (99.55)                |
| Other                            | 2 (0.45)                   |
| Retirement status                |                            |
| Employed                         | 295 (66.00)                |
| Retirement                       | 135 (30.20)                |
| Full time at home                | 17 (3.80)                  |
| Monthly per capita income (Yuan) |                            |
| ≥15 000                          | 76 (17.00)                 |
| 10 000–                          | 72 (16.11)                 |
| 5 000–                           | 168 (37.58)                |
| 1 000–                           | 130 (29.09)                |
| ≤999                             | 1 (0.22)                   |
| Marital status                   |                            |
| Married                          | 402 (89.93)                |
| Unmarried                        | 5 (1.12)                   |
| Widow                            | 10 (2.24)                  |
| Divorced                         | 30 (6.71)                  |
| Menstrual status                 |                            |
| Regular                          | 147 (32.89)                |
| Irregular                        | 140 (31.32)                |
| Menopause                        | 160 (35.79)                |

**条目分析** 临界比值法、项目系数法以及内部一致性分析结果。“一天中哪几个时间段是晒太阳补充维生素的最佳时间”“您认为每天需要晒多长时间的太阳可以促进骨健康”“为促进骨健康,您会每天摄取含钙量高的食物吗”“您为了骨骼健康,是否能坚持有规律的运动?”4个条目被去掉后,问卷总体Cronbach’s α系数略有提升(Cronbach’s α=0.784),并且各个条目与总分之间的相关性<0.4。考虑到问卷的内容完整性,经过专家讨论后,上述4个条目中删减“一天中哪几个时间段是晒太阳补充维生素的最佳时间”,其余3个条目保留。最终保留40个条目,其中医疗服务13条,疾病预防10条,健康促进17条,保留条目与所属领域的相关系数为0.067~0.580。

**信度** 问卷的Cronbach’s α系数为0.763,分半系数为0.793。3个领域的Cronbach’s α系数为0.403~0.703,分半系数为0.488~0.693(表2)。

表2 骨健康素养问卷的信度分析结果

Tab 2 Reliability of bone health literacy questionnaire

| Domains                 | Number of items | Cronbach’s α coefficient | Spearman-Brown coefficient |
|-------------------------|-----------------|--------------------------|----------------------------|
| General questionnaire   | 40              | 0.763                    | 0.793                      |
| Health care (HC)        | 13              | 0.703                    | 0.693                      |
| Disease prevention (DP) | 10              | 0.403                    | 0.488                      |
| Health promotion (HP)   | 17              | 0.457                    | 0.565                      |

效度

**内容效度** 问卷各领域所测内容与总问卷所测内容之间存在较高程度的一致性,3个领域得分与总分之间的相关系数为0.786~0.842(表3),而各领域得分间的相关系数较小,各领域得分与问卷总分间具有较好的相关性( $P<0.01$ )。

表3 问卷各领域得分及问卷总分的相关系数

Tab 3 Correlation coefficients between the scores of each dimension and the total score of the questionnaire

| Domains               | General questionnaire | Disease prevention | Health promotion | Health care |
|-----------------------|-----------------------|--------------------|------------------|-------------|
| General questionnaire | 1                     |                    |                  |             |
| Disease prevention    | 0.786                 | 1                  |                  |             |
| Health promotion      | 0.811                 | 0.471              | 1                |             |
| Health care           | 0.842                 | 0.570              | 0.455            | 1           |

**会聚效度** 分别计算中老年女性骨健康素养问卷每个条目得分与每个领域得分及问卷总分的相关系数,结果显示,疾病预防、健康促进、医疗服

务3个领域得分与问卷总分之间的相关系数分别为0.786、0.811、0.842。各条目与所属领域的相关系数为0.111~0.546(表4),问卷的会聚效度定标试验成



功率为57.5%(表5),反映了上海市中老年女性骨健康素养问卷的会聚效度较高。

**区别效度** 各条目与所在领域的相关性大于各条目与其他领域的相关性,且差异有统计学意义,提示问卷具有较好的区别效度。问卷各条目与

总分间的相关系数为0.013~0.591(表4),大多数条目与所属领域的相关性高于该条目与其他领域的相关性( $P<0.05$ ),问卷的区别效度定标试验成功率为86.25%(表5)。

**表4 问卷各条目与3个领域得分及问卷总分之间的相关系数**

**Tab 4 Correlation coefficient between each item and the scores of the three dimensions and the total score of the questionnaire**

| Domains and items  | Disease prevention | Health promotion | Health care | General questionnaire |
|--|--------------------|------------------|-------------|-----------------------|
| Disease prevention   | 0.546              | 0.344            | 0.353       | 0.488                 |
| DP1-Get information on osteoporosis prevention   |                    |                  |             |                       |
| DP2-Which of the following behaviors are likely to cause osteoporosis  | 0.538              | 0.350            | 0.565       | 0.585                 |
| DP3-Children whose parents have osteoporosis are more likely to suffer from osteoporosis   | 0.439              | 0.247            | 0.328       | 0.260                 |
| DP4-Men are more prone to calcium deficiency than women  | 0.497              | 0.111            | 0.064       | 0.442                 |
| DP5-Increased risk of fractures due to osteoporosis  | 0.407              | 0.026            | 0.011       | 0.389                 |
| DP6-Do you smoke? If you smoke, you can quit smoking in order to prevent osteoporosis  | 0.238              | 0.173            | 0.185       | 0.193                 |
| DP7-Do you drink? If you drink, in order to prevent osteoporosis, you can give up drinking   | 0.258              | 0.344            | 0.353       | 0.160                 |
| DP8-To promote bone health, you will not let your weight be too low  | 0.216              | 0.350            | 0.565       | 0.061                 |
| DP9-Doctor suggests taking more food rich in vitamin D and calcium. When you buy food, you will specially choose some food rich in calcium and vitamin D | 0.362              | 0.247            | 0.328       | 0.229                 |
| DP10-Doctor suggests doing 30 minutes of exercise every day, although there are still many things to do, so you will choose to exercise                  | 0.444              | 0.111            | 0.064       | 0.301                 |
| Health promotion   |                    |                  |             |                       |
| HP1-Do you take the initiative to pay attention to bone health information   | 0.268              | 0.422            | 0.205       | 0.370                 |
| HP2-Which information channels do you trust most   | 0.229              | 0.301            | 0.244       | 0.321                 |
| HP3-At which age do we have the highest bone mass  | 0.051              | 0.269            | 0.048       | 0.161                 |
| HP4-How many units of calcium should be added every day to promote bone health   | 0.158              | 0.111            | 0.376       | 0.271                 |
| HP5-How many units of vitamin D do you need every day to promote your own bone health  | 0.240              | 0.462            | 0.294       | 0.420                 |
| HP6-Which of the following foods are good sources of calcium   | 0.106              | 0.367            | 0.206       | 0.295                 |
| HP7-Which of the following foods are good sources of vitamin D   | 0.158              | 0.244            | 0.154       | 0.231                 |
| HP8-Which of the following exercises can better promote bone health  | 0.222              | 0.384            | 0.242       | 0.355                 |
| HP9-How many days a week do you think a person should exercise to strengthen bones   | 0.430              | 0.467            | 0.449       | 0.552                 |
| HP10-How long should you exercise at least one day to strengthen your bones  | 0.200              | 0.405            | 0.217       | 0.347                 |
| HP11-To supplement vitamins, which of the following options is the right way to bask in the sun  | 0.113              | 0.195            | 0.031       | 0.138                 |
| HP12-How long do you think you need to bask in the sun every day to promote bone health  | 0.155              | 0.381            | 0.178       | 0.304                 |
| HP13-Any type of physical activity is good for bone health   | 0.002              | 0.280            | 0.019       | 0.138                 |
| HP14-Do you eat foods with high calcium content every day to promote bone health   | 0.075              | 0.296            | 0.222       | 0.260                 |
| HP15-Can you exercise regularly for bone health  | 0.094              | 0.067            | 0.101       | 0.013                 |
| HP16-Are you willing to participate in science popularization activities related to bone health  | 0.061              | 0.123            | 0.096       | 0.031                 |
| HP17-Are you willing to receive bone health knowledge from WeChat  | 0.152              | 0.407            | 0.095       | 0.277                 |
| Health care  |                    |                  |             |                       |
| HC1-Get information on diagnosis and treatment of osteoporosis   | 0.461              | 0.287            | 0.430       | 0.471                 |
| HC2-Do you know which departments can go to diagnose osteoporosis  | 0.455              | 0.338            | 0.512       | 0.530                 |
| HC3-What are the common symptoms of patients with osteoporosis   | 0.276              | 0.300            | 0.538       | 0.469                 |
| HC4-What are the main bases for clinical diagnosis of osteoporosis   | 0.078              | 0.085            | 0.173       | 0.142                 |

(续表 4)

| Domains and items  | Disease prevention | Health promotion | Health care | General questionnaire |
|--|--------------------|------------------|-------------|-----------------------|
| HC5-How long to take medicine after osteoporosis is diagnosed  | 0.418              | 0.428            | 0.580       | 0.591                 |
| HC6-Osteoporosis is a normal physiological phenomenon that occurs when people get older, and they do not need to seek medical advice   | 0.313              | 0.319            | 0.540       | 0.490                 |
| HC7-No effective treatment for osteoporosis in the elderly at present  | 0.240              | 0.244            | 0.528       | 0.428                 |
| HC8-Your height is 3 cm shorter than when you were young, and you have hunchback. You often have sore knees and back, which cannot be relieved after rest. If you have these symptoms, you will choose | 0.098              | 0.024            | 0.407       | 0.228                 |
| HC9-Last winter, you slipped and fell down carelessly. It was painful and you couldn't walk. Which of the following measures would you choose  | 0.198              | 0.131            | 0.542       | 0.369                 |
| HC10-Diagnosed with osteoporosis, you will choose how to deal with it  | 0.241              | 0.124            | 0.472       | 0.348                 |
| HC11-After a period of treatment, you need to come back to the hospital for bone health examination. Will you choose to recheck  | 0.278              | 0.096            | 0.426       | 0.325                 |
| HC12-What do you think of the "folk prescription" for osteoporosis   | 0.207              | 0.175            | 0.462       | 0.356                 |
| HC13-If you are screened as a high-risk population for osteoporosis, do you want to conduct a professional bone mineral density test   | 0.461              | 0.287            | 0.430       | 0.471                 |

结构效度 对项目分析后的 40 个条目采用最大似然法进行验证性因子分析,分别拟合医疗服务、疾病预防和健康促进 3 个领域的测量模型,结果显示,不同领域的 GFI(0.985、0.910、0.959)和 RMR (0.024、0.044、0.037)等指标大都满足要求,表明拟合较好(表 6)。

表 5 问卷会聚效度和区别效度  
Tab 5 Convergent and discriminant validity of the questionnaire

| Domains            | Number of item | Convergent validity |                           |              | Discriminant validity |                           |              |
|--------------------|----------------|---------------------|---------------------------|--------------|-----------------------|---------------------------|--------------|
|                    |                | Coefficient range   | Number of successes/tests | Success rate | Coefficient range     | Number of successes/tests | Success rate |
| Disease prevention | 10             | 0.216-0.546         | 5/10                      | 50.00%       | 0.011-0.565           | 15/20                     | 75.00%       |
| Health promotion   | 17             | 0.051-0.430         | 6/17                      | 35.29%       | 0.048-0.467           | 30/34                     | 88.24%       |
| Health care        | 13             | 0.078-0.461         | 12/13                     | 92.31%       | 0.024-0.580           | 24/26                     | 92.31%       |
| Total              | 40             | -                   | 23/40                     | 57.50%       | -                     | 69/80                     | 86.25%       |

表 6 问卷验证性因子分析拟合结果  
Tab 6 Result of confirmatory factor analysis on the questionnaire

| Domains            | $\chi^2/df$ | RMSEA       | GFI        | AGFI       | RMR         | CFI        | NFI        | RFI        | IFI        |
|--------------------|-------------|-------------|------------|------------|-------------|------------|------------|------------|------------|
| Reference          | $\leq 3$    | $\leq 0.08$ | $\geq 0.9$ | $\geq 0.9$ | $\leq 0.05$ | $\geq 0.9$ | $\geq 0.9$ | $\geq 0.9$ | $\geq 0.9$ |
| Disease prevention | 2.209       | 0.052       | 0.985      | 0.966      | 0.024       | 0.979      | 0.963      | 0.939      | 0.980      |
| Health promotion   | 7.672       | 0.122       | 0.910      | 0.850      | 0.044       | 0.596      | 0.571      | 0.427      | 0.604      |
| Health care        | 6.470       | 0.111       | 0.959      | 0.905      | 0.037       | 0.843      | 0.823      | 0.705      | 0.846      |

RMSEA: Root-mean-square error of approximation; GFI: Goodness of fit index; AGFI: Adjusted goodness of fit index; RMR: Root mean square residual; CFI: Comparative fit index; NFI: Normed fit index; RFI: Relative fit index; IFI: Incremental fit index.

讨 论

随着人口老龄化趋势的日益严重,骨质疏松症的防控已成为我国重要的公共卫生问题。健康素养对人们拥有正确的健康知识、有益的健康行为和对自身健康状况的了解具有重要作用。低水平的

健康素养导致人们不能充分利用卫生服务、无法早期诊断疾病、在疾病治疗过程中不能准确理解医嘱,缺乏自我管理技能,最终影响个体健康状况和生命质量。目前国内外已开发了多种普适性健康素养工具以及针对特定疾病(如高血压、糖尿病等)的健康素养评估工具,但目前尚无适合中老年女性骨健康素养评估的较为常用的问卷或测评工具。

鉴于雌激素水平急剧下降对女性骨质疏松的突出影响,开发适用于围绝经期和绝经早期女性的骨健康素养评估工具对于保护和提升女性的生命质量具有重要的健康意义和应用价值。

我们研发的中老年女性骨健康素养问卷内在一致性Cronbach's  $\alpha$ 系数和分半信度分别为0.763和0.793,略低于日本学者研制的《功能性健康素养量表》<sup>[14]</sup>(Cronbach's  $\alpha$ 系数为0.81)和汉化的《高血压健康素养评估量表》<sup>[15]</sup>(Cronbach's  $\alpha$ 系数为0.83),与中国健康中心设计开发的《中国糖尿病患者糖尿病防治素养调查问卷》<sup>[16]</sup>(Cronbach's  $\alpha$ 系数为0.78)的信效度检验结果相近。分析原因认为:(1)本研究研制的问卷以骨健康为主题,与上述量表、问卷所针对的高血压、糖尿病等健康领域存在一定差异;(2)本研究采用问卷形式,条目设置与量表所要求的结构形式有所不同;(3)日本学者编制功能性健康素养问卷基于“功能性、互动性、评判性”三层次健康素养理论体系,而本研究采用的是WHO的“健康素养整合模型”,其信度的考量有所不同。从效度来看,本研究问卷各领域所测量的内容与总问卷之间存在较高程度的一致性,3个领域得分与问卷总分之间的相关系数为0.403~0.703,而领域得分间的相关系数较小,各领域与总问卷具有较好的相关性( $P<0.01$ ),说明问卷具有很好的内容效度,也说明问卷各条目有其独立性,可反映所在领域的状况。会聚效度和区别效度分别以每个条目得分与所在领域得分之间的相关系数以及每个条目与本领域的相关性和其他领域的相关性比较来衡量,结果显示:问卷的会聚效度与区别效度定标实验成功率分别为57.50%和86.25%,以过往研究<sup>[17]</sup>采用的定标试验成功率 $\geq 80\%$ 作为评价标准,说明该问卷具有较好的区别效度,但会聚效度尚有待提升;验证性因子分析结果显示,大多数指标达到适配标准,说明问卷结构效度良好。

本研究存在以下局限性:(1)考虑到基线调查后的再调查会受到信息污染的影响,本研究未对调查对象进行素养水平的重复测试,因此无法验证问卷的重测信度,针对问卷内容效度的测量未使用更常见的内容效度指数进行评估。(2)问卷的适用范围有年龄段限制,以45~65岁围绝经期及绝经早期的女性作为调查对象,其推广应用有待验证。(3)考虑到研究的可行性和研究基础,本研究的一级抽样

方法为针对性抽样,尽管已覆盖了上海市1/3以上区县,但对象的代表性仍有可能不足。总体而言,本研究开发的问卷具有较好的实用性,可作为评价相应人群骨质疏松症健康素养水平的简易工具。

综上所述,本研究编制了适用于中老年女性骨质疏松症健康素养评估的问卷,问卷条目数量适中,具有较高的信度和效度,有较好的应用前景。

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**利益冲突声明** 所有作者均声明不存在利益冲突。

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- (收稿日期:2022-08-11; 编辑:张秀峰)