



Topic Brief: Medicare Stars Health Outcomes Survey

Date: 1/10/2020

Nomination Number: 0890

Purpose: This document summarizes the information addressing a nomination submitted on 11/04/2019 through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: The Medicare Health Outcomes Survey (HOS) is administered annually by the Centers for Medicare and Medicaid Services (CMS) to track the health status of individuals enrolled in Medicare Advantage Organizations (MAOs). Changes in patient-reported health contribute to the healthcare providers' publicly reported Star Rating assigned by CMS, which is used for bonus payments to MAOs and by consumers to compare health plans. Multiple interventions have attempted to improve patient self-reported health status, but it is not clear which interventions are most effective and could be implemented by MAOs.

Program Decision: Though the scope of this topic met all EHC Program selection criteria and was considered for an evidence product, it was not selected to go forward.

Key Findings

No high-quality systematic reviews published within the last 3 years were identified. One recent review covers the scope of this topic but only one database was searched and no quality assessment of included studies was conducted¹. This review, however, provides an indication of the scope and volume of literature that would be identified in an evidence map, with 206 relevant studies (including observational study designs) published between 2000-2011.

A targeted search of the literature in the past 5 years identified 28 randomized trials of various interventions (e.g. self-management, exercise) in different clinical populations (e.g. patients with cancer, diabetes) which all reported changes in patient-reported health status as measured by a VR/SF measure.

Background

In 1996, CMS initiated the development of the Medicare HOS, representing the first patient-reported outcomes measure in Medicare managed care. The goal of the HOS program is to collect clinically meaningful data that are valid and reliable and can be used for quality improvement, monitoring the performance of health plans, assisting Medicare beneficiaries in making informed health care choices, and promoting health outcomes measurement.

The HOS is administered annually to a random sample of Medicare beneficiaries drawn from each participating MA plan. Two years later, these same respondents are surveyed again. The baseline sample size is 1,200.

The Veterans RAND 12-item Health Survey (VR-12) is administered to Medicare enrollees as part of the Medicare HOS. It is distinct from but related to the SF-36 and SF-12. The 12 items are summarized into physical component summary (PCS) and mental component summary (MCS) scores. The PCS and MCS measures have been publicly reported in the Medicare Star Rating, which are used to link quality of care to payment for MAOs with Quality Bonus Payments, thus incentivizing improvement of quality indicators such as the PCS and MCS outcomes measures.

For the Medicare Part C Star Ratings, the primary PCS and MCS outcomes are reported as the percentage of respondents within an MAO who are “Improving or Maintaining Physical Health” (C04), and the percentage within an MAO who are “Improving or Maintaining Mental Health” (C05) over the two-year period, after adjustment for casemix (to control for pre-existing baseline differences across MAOs, such as baseline measures of sociodemographic characteristics, chronic medical conditions, and functional health status).

In 2019, one-third (34%) of all Medicare beneficiaries – 22 million people – were enrolled in Medicare Advantage (MA) plans. Approximately 52% of the 401 MA contracts offering prescription drug coverage (MA-PDs) that will be offered in 2020 earned 4 or higher stars (out of 5) for their 2020 overall rating. 81% of enrollees are in contracts that will have 4 or more stars in 2020. The average Star Rating for measure C04 (improving or maintaining physical health) and C05 (improving or maintaining mental health) in 2020 are 3.2 and 3.9, respectively, with scores varying from year to year². Also, importantly for health systems, these outcome measures are assigned a higher weighting in the Stars Ratings than, for example, patient experience and complaints measures (e.g. ‘getting appointments and care quickly’) and process measures (e.g. ‘Annual Flu Vaccine’).

An important question for health systems involves how they can improve patient-reported physical and mental health (as measured by VR/SF measures).

Nomination Summary

This nomination came from a health system as part of their efforts to investigate which interventions impact patients’ self-reported physical and mental health. Before submitting this nomination, the nominator conducted their own in-house rapid review of the literature using the following criteria:

Population: Medicare-eligible population (US adults aged 65 and older; adults with long-term disability)

Intervention: Health care system-feasible interventions (excluded studies of interventions that could not be implemented in health care or in collaboration with health care, surgical interventions, and prescription pharmaceutical interventions.)

Comparators: Any

Outcomes: Physical or mental health, as measured by VR-12 or a highly similar measure (i.e., SF-12)

Design: RCTs/CCTs, systematic reviews

Date of search: 2010-April 2019

In addition to their internal literature review, the nominator has evaluated the national data from the health outcomes survey, and their own health outcome survey data linked with medical record data. They also reported having interviewed experts around the country and an external assessment of both high performing plans, as well as vendors who offer services related to improvement in the HOS measure. Many vendors offer products intended to raise health systems Star Ratings (for example [Star Navigator](#) and [StarServ](#)) but there is no known published evidence to support their claims for effectiveness.

The nominator's internal search identified 26 relevant studies and 1 report from the grey literature. Most studies reported on individuals with chronic physical and mental health conditions. The nominators reported finding limited evidence that supports targeting specific interventions to improve measures of self-reported physical or mental health. Three studies examined cognitive behavioral therapy interventions, but results were mixed. Studies targeting individuals with chronic conditions reported some improvements in self-reported health following interventions to promote self-management and treatment adherence; group and peer support; and stress reduction.

Scope

1. Which healthcare system feasible interventions result in changes in patient-reported health status, as measured by the VR-12/SF-12?

Assessment Methods

See Appendix A.

Summary of Literature Findings

A search was conducted to find systematic reviews from the last 3 years that addressed the nomination. We found one recently published review by Selim et al. (2019)¹. This review only searched one database (PubMed) and did not conduct a quality assessment. It analyzed 418 articles from 2000-2017 to provide interpretive guidelines for the change in physical (PCS) and mental component summaries (MCS) of well-established patient-reported measures (MOS, SF-36 V1, HOS SF-12, VR-36 and VR-12) in adults with chronic conditions. This review was intended to be used as an organizational tool to improve the delivery of interventions. Inclusion criteria were (1) evaluation of a clinical or social/behavioral intervention, (2) metrics evaluated included an SF/VR measure (SF-36, SF-12, VR-36, and VR-12 measures), (3) a study with at least a baseline and follow-up assessment using the SF/VR metric, (4) quantitative empiric data presented in the publication for the SF/VR endpoints before and after an intervention. They included both randomized comparative studies and observational (one-arm) study designs. They included articles from 14 clinical areas including cardiovascular, musculoskeletal/orthopedics and respiratory disorders and interventions including surgery and medications (which are not of interest to the nominator). Excluding the surgical and medication interventions, this review identified 206 studies published between 2000-2017.

We conducted a limited literature search of randomized trials from the last 5 years of interventions which included the outcome of self-reported health (as measured by a VR/SF measure) for those with chronic conditions. 28 relevant studies were identified (see Table 1). These trials studied a range of interventions and patient populations. Thirteen studies reported on the effects of an exercise/physical activity intervention³⁻¹⁵ as either a single or multi-component intervention. All the exercise/physical activity intervention trials assessed different populations, including patients with hypertension³, intermittent claudication⁵, colon cancer⁶, stroke⁷, heart

transplant patients⁹, chronic neck pain¹¹, end-stage renal disease¹³, prostate cancer¹⁴, and ovarian cancer¹⁵. Other studies reported on the impact of interventions such as self-management¹⁶⁻¹⁸ and group education¹⁹. Nine randomized trials reported the outcome of patient-reported health as measured by the VR-12 or SF-12^{7, 16-23}. Nineteen trials measured self-reported health using the SF-36^{3-6, 8-15, 24-30}.

A search was also conducted in PubMed and in a business database (EBSCOHost) to look for literature that reports on improving Medicare Star Rating scores. No studies were found that reported the implementation of strategies to improve patients' self-reported health status.

Two studies that were identified explored correlations between factors such as the presence of chronic conditions and results of the HOS and Medicare Advantage plans quality ratings. One study found that MA contracts with high concentrations of complex patients were more likely to perform less well on 22 of 27 Part C Star Rating performance measures collected by the Medicare program, and these differences persisted after controlling for social risk factors on 14 measures³¹. Another observational study reported on the burden of sciatica on Medicare enrollees and found that VR-12 PCS and MCS outcomes were lower at baseline and 2-year follow-up in those patients with sciatica³².

Table 1. Literature identified

Search	Primary studies (12/2014-12/2019)
Search 1: Interventions which include VR/SF outcomes	Total: 28 <ul style="list-style-type: none"> • RCT: 28³⁻³⁰
Search 2: Improving Medicare Star ratings	Total: 2 <ul style="list-style-type: none"> • Observational studies: 2^{31, 32}

See Appendix B for detailed assessments of all EPC selection criteria.

Other Analysis

We explored an alternative approach to answering the nominators question of improving self-reported health status. Instead of an evidence review, we explored an approach which may involve undertaking a more targeted primary analysis of the HOS and Star Ratings data to explore which other measures may be statistically correlated and have clinically meaningful associations with physical and mental health outcomes. This may suggest that improvements in other measures could improve physical and mental health outcomes. However, we conducted an exploratory correlation analysis of the patient-reported health measures, using the publicly available Stars Ratings data (available from <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/PerformanceData>). Very little overlap was found between the physical and mental health outcomes and other health system plan performance measures and the results did not warrant any additional analysis (see Appendix C for further details).

Summary of Selection Criteria Assessment

As stated in the topic nomination, the nominator recognizes that this is an atypical evidence request as they are starting with a specific outcome and exploring the evidence of the impact of interventions on that outcome. Firstly, for this topic brief, a search was conducted which built upon the internal evidence review conducted by the nominator. The search looked for interventions for chronic conditions (consulted CDC's Chronic Diseases in America website for list of top chronic conditions) that improve self-reported health outcomes, as measured by the SF/VR measures. However, searching by outcomes is likely to be problematic because authors

often do not include all outcomes (or their measures) in the abstract or other fields available to search in bibliographic databases.

Considering the nature of the evidence base, we recommended two different options for the EPC program to consider. One was the development of an evidence map to gain a better understanding of the existing mix of studies that report SF/VR outcomes and/or to focus research synthesis questions for a further systematic review. An evidence map based on the nominator's own internal review key question/PICOTS would be feasible. Though an evidence map would likely identify a similar yield of studies that were reported in Selim et al. (2019)¹, a new AHRQ EPC program evidence map could be structured to focus more on the applicability of the interventions to the health system and review the implementation findings of the included studies.

Another approach to addressing this topic is through a process of using the evidence and working with the nominator and potentially several other health systems to identify clinical populations with poorer VR-12 scores and/or particular interventions that the health system has the potential to implement/de-implement within their health system. This approach could also involve a careful critique of the existing literature review¹, through an assessment of the included studies and a review of the applicability of the interventions to the health system and the implementation findings. The development of a further evidence product to aid with their decision making for a particular intervention or population could then be further explored.

Please see Appendix B for detailed assessments of individual EPC Program selection criteria.

References

1. Selim AJ, Qian SX, Rogers W, et al. Health Status in Adults With Chronic Conditions: Intervention Strategies for Improving Patient-Reported Outcomes. *J Ambul Care Manage*. 2019 Jan/Mar;42(1):2-20. doi: <https://dx.doi.org/10.1097/jac.0000000000000262>. PMID: 30499897
2. Fact Sheet - 2020 Part C and D Star Ratings. Centers for Medicare & Medicaid Services. <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/PerformanceData>.
3. Arija V, Villalobos F, Pedret R, et al. Physical activity, cardiovascular health, quality of life and blood pressure control in hypertensive subjects: randomized clinical trial. *Health Qual Life Outcomes*. 2018 Sep 14;16(1):184. doi: <https://dx.doi.org/10.1186/s12955-018-1008-6>. PMID: 30217193
4. Benda NM, Seeger JP, Stevens GG, et al. Effects of High-Intensity Interval Training versus Continuous Training on Physical Fitness, Cardiovascular Function and Quality of Life in Heart Failure Patients. *PLoS ONE*. 2015;10(10):e0141256. doi: <https://dx.doi.org/10.1371/journal.pone.0141256>. PMID: 26517867
5. Bo E, Bergland A, Strandén E, et al. Effects of 12 Weeks of Supervised Exercise After Endovascular Treatment: A Randomized Clinical Trial. *Physiother Res Int*. 2015 Sep;20(3):147-57. doi: <https://dx.doi.org/10.1002/pri.1608>. PMID: 25451336
6. Brown JC, Damjanov N, Courneya KS, et al. A randomized dose-response trial of aerobic exercise and health-related quality of life in colon cancer survivors. *Psychooncology*. 2018 04;27(4):1221-8. doi: <https://dx.doi.org/10.1002/pon.4655>. PMID: 29388275
7. Calugi S, Taricco M, Rucci P, et al. Effectiveness of adaptive physical activity combined with therapeutic patient education in stroke survivors at twelve months: a non-randomized parallel group study. *Eur J Phys Rehabil Med*. 2016 Feb;52(1):72-80. PMID: 26220329. <https://www.ncbi.nlm.nih.gov/pubmed/26220329>
8. Courneya KS, McNeil J, O'Reilly R, et al. Dose-Response Effects of Aerobic Exercise on Quality of Life in Postmenopausal Women: Results from the Breast Cancer and Exercise Trial in

- Alberta (BETA). *Ann Behav Med.* 2017 Jun;51(3):356-64. doi: <https://dx.doi.org/10.1007/s12160-016-9859-8>. PMID: 27837524
9. Dall CH, Gustafsson F, Christensen SB, et al. Effect of moderate- versus high-intensity exercise on vascular function, biomarkers and quality of life in heart transplant recipients: A randomized, crossover trial. *J Heart Lung Transplant.* 2015 Aug;34(8):1033-41. doi: <https://dx.doi.org/10.1016/j.healun.2015.02.001>. PMID: 25840503
10. Lans C, Cider A, Nylander E, et al. Peripheral muscle training with resistance exercise bands in patients with chronic heart failure. Long-term effects on walking distance and quality of life; a pilot study. *ESC Heart Fail.* 2018 04;5(2):241-8. doi: <https://dx.doi.org/10.1002/ehf2.12230>. PMID: 29168621
11. Ris I, Sogaard K, Gram B, et al. Does a combination of physical training, specific exercises and pain education improve health-related quality of life in patients with chronic neck pain? A randomised control trial with a 4-month follow up. *Manual Ther.* 2016 Dec;26:132-40. doi: <https://dx.doi.org/10.1016/j.math.2016.08.004>. PMID: 27598552
12. Rogers LQ, Courneya KS, Carter SJ, et al. Effects of a multicomponent physical activity behavior change intervention on breast cancer survivor health status outcomes in a randomized controlled trial. *Breast Cancer Res Treat.* 2016 Sep;159(2):283-91. doi: <https://dx.doi.org/10.1007/s10549-016-3945-2>. PMID: 27539586
13. Rosa C, Nishimoto DY, Souza GDE, et al. Effect of continuous progressive resistance training during hemodialysis on body composition, physical function and quality of life in end-stage renal disease patients: a randomized controlled trial. *Clin Rehabil.* 2018 Jul;32(7):899-908. doi: <https://dx.doi.org/10.1177/0269215518760696>. PMID: 29504416
14. Winters-Stone KM, Lyons KS, Dobek J, et al. Benefits of partnered strength training for prostate cancer survivors and spouses: results from a randomized controlled trial of the Exercising Together project. *J.* 2016 08;10(4):633-44. doi: <https://dx.doi.org/10.1007/s11764-015-0509-0>. PMID: 26715587
15. Zhou Y, Cartmel B, Gottlieb L, et al. Randomized Trial of Exercise on Quality of Life in Women With Ovarian Cancer: Women's Activity and Lifestyle Study in Connecticut (WALC). *J Natl Cancer Inst.* 2017 12 01;109(12):01. doi: <https://dx.doi.org/10.1093/jnci/djx072>. PMID: 30053074
16. Sugiyama T, Steers WN, Wenger NS, et al. Effect of a community-based diabetes self-management empowerment program on mental health-related quality of life: a causal mediation analysis from a randomized controlled trial. *BMC Health Serv Res.* 2015 Mar 22;15:115. doi: <https://dx.doi.org/10.1186/s12913-015-0779-2>. PMID: 25880234
17. Freund T, Peters-Klimm F, Boyd CM, et al. Medical Assistant-Based Care Management for High-Risk Patients in Small Primary Care Practices: A Cluster Randomized Clinical Trial. *Ann Intern Med.* 2016 Mar 01;164(5):323-30. doi: <https://dx.doi.org/10.7326/M14-2403>. PMID: 26833209
18. Battersby M, Harris M, Smith D, et al. A pragmatic randomized controlled trial of the Flinders Program of chronic condition management in community health care services. *Patient Educ Couns.* 2015 Nov;98(11):1367-75. doi: <https://dx.doi.org/10.1016/j.pec.2015.06.003>. PMID: 26146240
19. Saffari M, Emami Meybodi MK, Sanaeinasab H, et al. A theory of planned behavior-based intervention to improve quality of life in patients with knee/hip osteoarthritis: a randomized controlled trial. *Clin Rheumatol.* 2018 Sep;37(9):2505-15. doi: <https://dx.doi.org/10.1007/s10067-018-4120-4>. PMID: 29744608
20. Gonzalez-Ortega M, Gene-Badia J, Kostov B, et al. Randomized trial to reduce emergency visits or hospital admissions using telephone coaching to complex patients. *Fam Pract.* 2017 04 01;34(2):219-26. doi: <https://dx.doi.org/10.1093/fampra/cmw119>. PMID: 27920119
21. Kilbourne AM, Barbaresco MM, Lai Z, et al. Improving Physical Health in Patients With Chronic Mental Disorders: Twelve-Month Results From a Randomized Controlled Collaborative

- Care Trial. *J Clin Psychiatry*. 2017 01;78(1):129-37. doi: <https://dx.doi.org/10.4088/JCP.15m10301>. PMID: 27780336
- 22.** Orrell M, Yates L, Leung P, et al. The impact of individual Cognitive Stimulation Therapy (iCST) on cognition, quality of life, caregiver health, and family relationships in dementia: A randomised controlled trial. *PLoS Med*. 2017 03;14(3):e1002269. doi: <https://dx.doi.org/10.1371/journal.pmed.1002269>. PMID: 28350796
- 23.** Wan EY, Fung CS, Wong CK, et al. Effectiveness of a multidisciplinary risk assessment and management programme-diabetes mellitus (RAMP-DM) on patient-reported outcomes. *Endocrine*. 2017 Feb;55(2):416-26. doi: <https://dx.doi.org/10.1007/s12020-016-1124-1>. PMID: 27699706
- 24.** Barker-Collo S, Krishnamurthi R, Witt E, et al. Improving Adherence to Secondary Stroke Prevention Strategies Through Motivational Interviewing: Randomized Controlled Trial. *Stroke*. 2015 Dec;46(12):3451-8. doi: <https://dx.doi.org/10.1161/STROKEAHA.115.011003>. PMID: 26508749
- 25.** Berg SK, Pedersen PU, Zwisler AD, et al. Comprehensive cardiac rehabilitation improves outcome for patients with implantable cardioverter defibrillator. Findings from the COPE-ICD randomised clinical trial. *Eur J Cardiovasc Nurs*. 2015 Feb;14(1):34-44. doi: <https://dx.doi.org/10.1177/1474515114521920>. PMID: 24504872
- 26.** Boele FW, Klein M, Verdonck-de Leeuw IM, et al. Internet-based guided self-help for glioma patients with depressive symptoms: a randomized controlled trial. *J Neurooncol*. 2018 Mar;137(1):191-203. doi: <https://dx.doi.org/10.1007/s11060-017-2712-5>. PMID: 29236238
- 27.** Holland-Carter L, Tuerk PW, Wadden TA, et al. Impact on psychosocial outcomes of a nationally available weight management program tailored for individuals with type 2 diabetes: Results of a randomized controlled trial. *J Diabetes Complications*. 2017 May;31(5):891-7. doi: <https://dx.doi.org/10.1016/j.jdiacomp.2017.01.022>. PMID: 28319001
- 28.** Karhula T, Vuorinen AL, Raapysjarvi K, et al. Telemonitoring and Mobile Phone-Based Health Coaching Among Finnish Diabetic and Heart Disease Patients: Randomized Controlled Trial. *J Med Internet Res*. 2015 Jun 17;17(6):e153. doi: <https://dx.doi.org/10.2196/jmir.4059>. PMID: 26084979
- 29.** Tsai SH, Wang MY, Miao NF, et al. CE: original research: The efficacy of a nurse-led breathing training program in reducing depressive symptoms in patients on hemodialysis: a randomized controlled trial. *Am J Geriatr Psychiatry*. 2015 Apr;115(4):24-32; quiz 3, 42. doi: <https://dx.doi.org/10.1097/01.NAJ.0000463023.48226.16>. PMID: 25793429
- 30.** van Gemert WA, van der Palen J, Monninkhof EM, et al. Quality of Life after Diet or Exercise-Induced Weight Loss in Overweight to Obese Postmenopausal Women: The SHAPE-2 Randomised Controlled Trial. *PLoS ONE*. 2015;10(6):e0127520. doi: <https://dx.doi.org/10.1371/journal.pone.0127520>. PMID: 26029921
- 31.** DuGoff EH, Boyd C, Anderson G. Complex Patients and Quality of Care in Medicare Advantage. *J Am Geriatr Soc*. 2019 Nov 01;01:01. doi: <https://dx.doi.org/10.1111/jgs.16236>. PMID: 31675101
- 32.** Maslak JP, Jenkins TJ, Weiner JA, et al. Burden of Sciatica on US Medicare Recipients. *J Am Acad Orthop Surg*. 2019 Sep 09;09:09. doi: <https://dx.doi.org/10.5435/JAAOS-D-19-00174>. PMID: 31517882
- 33.** Medicare Statistics and Facts. Statista. <https://www.statista.com/topics/1167/medicare/>.
-

Author

Jennifer Hilgart
Kimberly Hubbard
Kelly Vander Ley
Robin Paynter
Mark Helfand

Conflict of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

Acknowledgements

Christine Chang

This report was developed by the SRC under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. HHS 290-2017-00003C). The findings and conclusions in this document are those of the author(s) who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. No statement in this article should be construed as an official position of the Agency for Healthcare Research and Quality or of the U.S. Department of Health and Human Services.

Persons using assistive technology may not be able to fully access information in this report. For assistance contact EPC@ahrq.hhs.gov.

Appendix A: Methods

We assessed nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for detailed description of the criteria.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Absence of Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years (to December 06, 2019) on the questions of the nomination from these sources:

- AHRQ: Evidence reports and technology assessments
 - AHRQ Evidence Reports <https://www.ahrq.gov/research/findings/evidence-based-reports/index.html>
 - EHC Program <https://effectivehealthcare.ahrq.gov/>
 - US Preventive Services Task Force <https://www.uspreventiveservicestaskforce.org/>
 - AHRQ Technology Assessment Program <https://www.ahrq.gov/research/findings/ta/index.html>
- US Department of Veterans Affairs Products publications
 - Evidence Synthesis Program <https://www.hsrd.research.va.gov/publications/esp/>
 - VA/Department of Defense Evidence-Based Clinical Practice Guideline Program <https://www.healthquality.va.gov/>
- Cochrane Systematic Reviews <https://www.cochranelibrary.com/>
- PROSPERO Database (international prospective register of systematic reviews and protocols) <http://www.crd.york.ac.uk/prospéro/>
- PubMed <https://www.ncbi.nlm.nih.gov/pubmed/>
- McMaster Health System Evidence <https://www.healthsystemsevidence.org/>
- UBC Centre for Health Services and Policy Research <http://chspr.ubc.ca/>

Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of New Evidence Review

We conducted a limited literature search in PubMed and Business Source Premier (EBSCOHost) for the last five years (December 6, 2014 to December 6, 2019). We reviewed all studies identified titles and abstracts for inclusion. We classified identified studies by question and study design to estimate the size and scope of a potential evidence review. A search was conducted which built upon the internal evidence review conducted by the nominator. The search looked for interventions for chronic conditions (consulted CDC's Chronic Diseases in America website for list of top chronic conditions) that improve self-reported health outcomes, as measured by the SF/VR measures. A search was also conducted in PubMed and in a business database (EBSCOHost) to look for literature that reports on improving Medicare Star Rating scores.

Search strategy

Date searched: December 9, 2019

- 1 Chronic Disease/ or Multiple Chronic Conditions/ or Alzheimer Disease/ or exp Cardiovascular Diseases/ or exp Diabetes Mellitus/ or exp Neoplasms/ or exp Renal Insufficiency, Chronic/ or exp Stroke/ (6041840)
- 2 ((chronic adj3 (care or condition* or disease* or illness* or cardiovascular* or condition* or disease* or heart or illness* or kidney or lung or pulmonary or renal or respiratory)) or alzheimer* or cancer* or diabet* or stroke*).ti,ab,kf. (2943403)
- 3 or/1-2 (6963025)
- 4 (SF-12 or SF-36 or "Short Form-12" or "Short Form-36" or VR-12 or VR-36 or "Veteran* RAND-12" or "Veteran* RAND-36").ti,ab,kf. and (Quality of Life/ or ("quality of life" or QoL or HRQoL).ti,ab,kf.) (20749)
- 5 and/3-4 (7596)
- 6 limit 5 to "all adult (19 plus years)" (6429)
- 7 limit 6 to yr="2017 -Current" (913)
- 8 limit 7 to english language (883)
- 9 8 not (dt or su).fs. (602)
- 10 (((evidence or systematic) adj2 (review or synthesis)) or metaanal* or meta-anal*).ti,ab. or (meta-analysis or systematic review).pt. (287789)
- 11 and/9-10 (21)
- 12 randomized controlled trials as topic/ or exp clinical trial as topic/ or comparative study/ (2134777)
- 13 ("randomized controlled trial" or "controlled clinical trial").pt. (584238)
- 14 (trial* or control* or random*).ti,ab. (4699237)
- 15 or/12-14 (6270501)
- 16 and/9,15 (287)
- 17 (((CMS or Medicare or MA plan or CAHPS or HCAHPS) adj5 (HOS or "health outcome survey" or rating* or score*)) or "hospital compare" or "Star Rating Program" or "Star Ratings Program" or "Hospital Consumer Assessment of Healthcare Providers and Systems").ti,ab,kf. (1248)
- 18 ((chronic adj3 (care or condition* or disease* or illness* or cardiovascular* or condition* or disease* or heart or illness* or kidney or lung or pulmonary or renal or respiratory)) or alzheimer* or cancer* or diabet* or stroke*).ti,ab,kf. or chronic.hw. (3307733)
- 19 (cleanliness or communicat* or care or discharg* or quietness or responsive* or transition*).ti,ab,kf. (2361226)
- 20 (high or higher or improv* or increas* or five-star or 5-star or four-star or 4-star).ti,ab,kf. (10334021)
- 21 or/19-20 (11485439)
- 22 and/17-18,21 (183)
- 23 22 not (surg*.ti. or -S-CAHPS.ti,ab,kf. or su.fs.) (151)

Business Source Premier (EBSCOHost)

Date searched: December 23, 2019

S6 S1 AND S2 AND S5 (9)

S5 S3 OR S4 (3,536,570)

S4 TI ((high or higher or improv* or increas* or five-star or 5-star or four-star or 4-star)) OR AB ((high or higher or improv* or increas* or five-star or 5-star or four-star or 4-star)) (2,844,811)

S3 TI ((cleanliness or communicat* or care or discharg* or quietness or responsive* or transition*)) OR AB ((cleanliness or communicat* or care or discharg* or quietness or responsive* or transition*)) (902,510)

S2 TI (((chronic N3 (care or condition* or disease* or illness* or cardiovascular* or condition* or disease* or heart or illness* or kidney or lung or pulmonary or renal or respiratory)) or alzheimer* or cancer* or diabet* or stroke*)) OR AB (((chronic N3 (care or condition* or disease* or illness* or cardiovascular* or condition* or disease* or heart or illness* or kidney or lung or pulmonary or renal or respiratory)) or alzheimer* or cancer* or diabet* or stroke*)) (97,433)

S1 TI ((((CMS or Medicare or MA plan or CAHPS or HCAHPS) N5 (HOS or "health outcome survey" or rating* or score*)) or "hospital compare" or "Star Rating Program" or "Star Ratings Program" or "Hospital Consumer Assessment of Healthcare Providers and Systems")) OR AB ((((CMS or Medicare or MA plan or CAHPS or HCAHPS) N5 (HOS or "health outcome survey" or rating* or score*)) or "hospital compare" or "Star Rating Program" or "Star Ratings Program" or "Hospital Consumer Assessment of Healthcare Providers and Systems")) (486)

Value

We assessed the nomination for value. We considered whether or not the clinical, consumer, or policymaking context had the potential to respond with evidence-based change; and if a partner organization would use this evidence review to influence practice.

Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes, the nomination relates to the U.S. Medicare population.
1b. Is the nomination a request for an evidence report?	Yes, the nomination is a request for an evidence product to inform the health system on improving patient self-reported health outcomes as measured by the VR-12/SF-12 in the CMS Medicare Health Outcomes Survey.
1c. Is the focus on effectiveness or comparative effectiveness?	Yes, the nomination focuses on the effectiveness of interventions in changing health status.
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes, previous literature has explored the impact of intervention strategies for improving patient-reported outcomes. The Health Outcomes Survey is a component of the Medicare Star Rating System for Medicare Advantage plans, which is used to calculate performance assessment.
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	In 2018, 17.8% of U.S. Americans were covered by Medicare. Total Medicare spending in 2018 was \$740.6 billion. Projected enrollment in Medicare in 2060 is 96.1 million people. ³³
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population	Yes, Medicare provides health insurance to older adults and disabled people.
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes, the topic will explore changes, both positive and negative, in patient-reported health status.
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Yes. In 2012, Medicare households spent \$4,722 on health care issues, whereas non-Medicare households spent \$2,772. ³³
3. Desirability of a New Evidence Review/Absence of Duplication	
3. A recent high-quality systematic review or other evidence review is not available on this topic	No existing high-quality systematic reviews were identified. One literature review was identified which covered the scope of this nomination ¹ . However, only one database was searched and did not perform a quality assessment of included studies. This review gives an indication of the scope and yield of the literature that an evidence map would cover, if such an evidence map was based on the nominators internal evidence review question and PICO. Excluding medicinal and surgical interventions (which were not of interest to the nominator) this review identified 206 studies published between 2000-2017.
4. Impact of a New Evidence Review	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	Yes, there are no guidelines about how healthcare systems can improve patient-reported health status as measured by the HOS and therefore improve patient outcomes and health systems Star ratings.
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	Yes, there is likely variation in the interventions that are implemented between healthcare systems.

Selection Criteria	Assessment
5. Primary Research	
5. Effectively utilizes existing research and knowledge by considering: <ul style="list-style-type: none"> - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies) 	The targeted literature search from the last five years identified 28 randomized trials reporting various interventions and populations and a VR/SF self-reported health outcome. 13 of the studies reported an exercise-based intervention. Populations across the studies were heterogeneous.
6. Value	
6a. The proposed topic exists within a clinical, consumer, or policy-making context that is amenable to evidence-based change	Yes, MAOs are given a Star rating based on the results of the HOS, which is used to determine eligibility for bonus payments. Health systems are therefore amenable to making changes in practice and policy based on the evidence.
6b. Identified partner who will use the systematic review to influence practice (such as a guideline or recommendation)	Yes, the nominator is a health system who will use the evidence product to implement change within their health system.

Abbreviations: AHRQ=Agency for Healthcare Research and Quality; CMS=Centers for Medicare and Medicaid Services; HOS=Health Outcomes Survey; MAOs=Medicare Advantage Organizations

Appendix C. Correlation Analysis of Stars Ratings dataset

An analysis was conducted on the publicly available 2020 Star Ratings Data (available from <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/PerformanceData>)

Simple correlations were conducted among the Part C Measures using data from 592 Local Coordinated Care Plans (CCPs). Table C1 below provides a summary of the significant correlations that were identified between measures C04 (improving physical health), C05 (improving mental health) and the other Part C measures. A full list of Part C measures can be found in Table C2 below. There was very little overlap between measures C04 and C05 and the other Part C measures. Pathways between statistically significant relationships were not clinically obvious. These results may suggest that a generic self-reported measure of overall health status is influenced by factors indirectly influencing health perceptions or reporting biases. The extent of missing data and lack of a clear model to limit the numbers of factors examined did not support further analysis.

Table C1. Part C STAR Domain and Measures: Exploratory Examination of Part C Measures' Relationships to Improving Physical Health and Mental Health

	C4-Improving Physical Health	C5-Improving Mental Health
Domain 1 (C1-C7)-- Staying Healthy: Screening, Tests and Vaccines		
C1-Breast Cancer Screening	.182** (n=316)	ns
C2-Colorectal Cancer Screening	.159** (n=318)	ns
C3-Annual Flu Vaccine	ns	.213** (n=311)
C6-Monitoring Physical Health	.176** (n=315)	
Domain 2 (C8-C21)—Managing Chronic (Long-term) Conditions		
C12-Osteoporosis Management in Women who had a Fracture	ns	-.202 ** (n=212)
C13-Diabetes Care-Eye Exam	.134* (n=317)	ns
C14-Diabetes Care-Kidney Disease Monitoring	ns	-.124* (n=310)
C15-Diabetes Care-Blood Sugar Controlled	.125* (n=317)	.146** (n=317)
C17-Reducing the Risk of Falling	ns	-.166** (n=306)
Domain 3 (C22-C27)—Member Experience with Health Plan		
C23-Getting Appointments and Care Quickly	-.143* (n=311)	.185** (n=311)
C27-Care Coordination	ns	.117* (n=308)
Domain 4 (C28-C30)--Member Complaints and Changes in the Health Plan's Performance		
Domain 5 (C31-C33)—Health Plan Customer Service		

Notes: Data set included 592 Local CCPs. Rank correlation measured by Spearman's rho.
*p<.05; **p<.01

Table C2. Star Ratings Part C Measures

Measure ID	Measure Name
C01	Breast Cancer Screening
C02	Colorectal Cancer Screening
C03	Annual Flu Vaccine
C04	Improving or Maintaining Physical Health
C05	Improving or Maintaining Mental Health
C06	Monitoring Physical Activity
C07	Adult BMI Assessment
C08	Special Needs Plan (SNP) Care Management

Measure ID	Measure Name
C09	Care for Older Adults – Medication Review
C10	Care for Older Adults – Functional Status Assessment
C11	Care for Older Adults – Pain Assessment
C12	Osteoporosis Management in Women who had a Fracture
C13	Diabetes Care – Eye Exam
C14	Diabetes Care – Kidney Disease Monitoring
C15	Diabetes Care – Blood Sugar Controlled
C16	Rheumatoid Arthritis Management
C17	Reducing the Risk of Falling
C18	Improving Bladder Control
C19	Medication Reconciliation Post-Discharge
C20	Plan All-Cause Readmissions
C21	Statin Therapy for Patients with Cardiovascular Disease
C22	Getting Needed Care
C23	Getting Appointments and Care Quickly
C24	Customer Service
C25	Rating of Health Care Quality
C26	Rating of Health Plan
C27	Care Coordination
C28	Complaints about the Health Plan
C29	Members Choosing to Leave the Plan
C30	Health Plan Quality Improvement
C31	Plan Makes Timely Decisions about Appeals
C32	Reviewing Appeals Decisions
C33	Call Center – Foreign Language Interpreter and TTY Availability