

# Health Outcomes and Costs of Social Work Services: A Systematic Review

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**Background.** Efforts to reduce expensive health service utilization, contain costs, improve health outcomes, and address the social determinants of health require research that demonstrates the economic value of health services in population health across a variety of settings. Social workers are an integral part of the US health care system, yet the specific contributions of social work to health and cost-containment outcomes are unknown.

The social work profession's person-in-environment framework and unique skillset, particularly around addressing social determinants of health, hold promise for improving health and cost outcomes.

**Objectives.** To systematically review international studies of the effect of social work-involved health services on health and economic outcomes.

**Search Methods.** We searched 4 databases (PubMed, PsycINFO, CINAHL, Social Science Citation Index) by using "social work" AND "cost" and "health" for trials published from 1990 to 2017.

**Selection Criteria.** Abstract review was followed by full-text review of all studies meeting inclusion criteria (social work services, physical health, and cost outcomes).

**Data Collection and Analysis.** Of the 831 abstracts found, 51 (6.1%) met criteria. Full text review yielded 16 studies involving more than 16 000 participants, including pregnant and pediatric patients, vulnerable low-income adults, and geriatric patients. We examined study quality, health and utilization outcomes, and cost outcomes.

**Main Results.** Average study quality was fair. Studies of 7 social work-led services scored higher on quality ratings than 9 studies of social workers as team members. Most studies showed positive effects on health and service utilization; cost-savings were consistent across nearly all studies.

**Conclusions.** Despite positive overall effects on outcomes, variability in study methods, health problems, and cost analyses render generalizations difficult. Controlled hypothesis-driven trials are needed to examine the health and cost effects of specific services delivered by social workers independently and through interprofessional team-based care.

**Public Health Implications.** The economic and health benefits reported in these studies suggest that the broad health perspective taken by the social work profession for patient, personal, and environmental needs may be particularly valuable for achieving goals of cost containment, prevention, and population health. Novel approaches that move beyond cost savings to articulate the specific value-added of social work are much needed. As health service delivery focuses increasingly on interprofessional training, practice, and integrated care, more research testing the impact of social work prevention and intervention efforts on the health and well-being of vulnerable populations while also measuring societal costs and benefits is essential. (*Am J Public Health.* 2017;107:S256–S266. doi: 10.2105/AJPH.2017.304004)

## PLAIN-LANGUAGE SUMMARY

Social work is well positioned to play an increasingly significant role in improving people's health through prevention, integrated health care, and improving the social determinants of health (e.g., housing, employment). We reviewed almost 3 decades of international research to understand whether services provided by social workers as leaders or

as team members improved health outcomes and reduced costs. The 16 published studies showed that social work services had positive benefits for both health and economic outcomes for vulnerable adults, children, pregnant women, and older adults. The quality of the research was higher when social workers were leaders of the health services rather than members of a team. Unfortunately, there were

too few studies to draw clear conclusions. To better understand the potential benefits of social work services for improving health, more research is needed on various health problems to understand the effects of both prevention and intervention efforts. This will help policymakers and funders invest in strategies that have a positive, lasting impact on the health and well-being of vulnerable populations.

Traditional models of health care delivery in the United States are disease-focused tertiary-level models of care.<sup>1</sup> With its “triple aim” of improving patient care, reducing costs, and improving population health outcomes, the 2010 Patient Protection and Affordable Care Act (ACA; Pub L No. 111-148) embodied a radical shift away from traditional medical treatment models and toward an expanded continuum of care. Such care includes interprofessional teams, care coordination, management of chronic disease, and primary and secondary prevention.<sup>2,3</sup>

Social workers are particularly well positioned to address this shift in emphasis given their focus on improving health service delivery and health outcomes for vulnerable populations who are often disadvantaged by multiple social determinants of health.<sup>4</sup> The social work profession’s biopsychosocial perspective and person-in-environment framework focus particularly on the social determinants of health and therefore hold promise for improving health outcomes. In the behavioral health arena, social work services have demonstrated such positive outcomes,<sup>5,6</sup> for example, in providing mental health services<sup>7</sup> and disseminating early detection interventions for substance abuse.<sup>8</sup> Less is known about the benefits of interventions delivered by social workers in the physical health arena.

The ACA’s call for cost containment and implementation of efficacious and effective interventions did not include social work among the professions specifically named in the legislative document. This omission may have been attributable to limited data on utility, role, and cost-effectiveness of social work interventions,<sup>9,10</sup> and limited social work leadership in illness prevention and health service delivery.<sup>11</sup> Efforts to reduce expensive health service utilization, contain costs, improve health outcomes, and address the social determinants of health require research that demonstrates the economic value of social work services in population health and across community and health settings.<sup>10,12</sup>

Current literature indicates that social workers practice in diverse settings and assume various roles within the health care system, such as case management, care

coordination, and provision of direct behavioral health services to medically ill patients. Social workers typically work within interprofessional provider teams of nurses, doctors, and allied health professionals.<sup>13,14</sup> Although they are an integral part of the US health care system, social workers’ specific contributions to health and cost-containment outcomes are unknown.<sup>15</sup> Most literature reviews examining social work activities and health services have focused on geriatric populations,<sup>14,16</sup> although one review examined hospital-based intervention with pediatric patients.<sup>17</sup> The sole systematic review of social work service effects and costs yielded promising findings but focused only on services for older adults.<sup>16</sup> Clearly, there is a critical need for research evidence that clarifies the economic value of direct social work services on health outcomes across a broader array of populations.<sup>10,12</sup>

The goal of the present study was to critically review the research literature on the potential benefits of social work interventions on health and cost, including study quality.<sup>18</sup> To our knowledge, this is the first systematic review of such research. Our aim was to determine the potential value of providing and reimbursing health-related social work services across populations and settings, especially for chronic disease, where collaboration across health disciplines including social work has the potential to improve both quality of care and health outcomes while containing costs.

## METHODS

In this systematic review, we used the methodological standards for Cochrane Intervention Reviews.<sup>19</sup> The research team searched 4 databases (PubMed, PsycINFO, CINAHL, Social Science Citation Index) by using the search terms “social work” AND

“cost” AND “health.” Two reviewers with graduate social work and public health degrees (A. R., M. W.) independently classified studies on inclusion and exclusion criteria; disagreements were resolved through discussion and consultation with the first author (G. S.). Figure 1 depicts the PRISMA diagram for this study. The search yielded 831 unique records published in English between January 1, 1990, and May 1, 2017. Of these, 51 abstracts (6.1%) met 3 required criteria: (1) evaluation of interventions delivered by social workers, (2) reported physical health outcomes, and (3) reported economic evaluation (e.g., cost savings, cost-effectiveness or health service utilization). Full text review eliminated 35 articles that lacked the required information. Among excluded articles, 8 reviews of the literature were also scanned for additional studies that were not generated by the database search process, but none met criteria for inclusion. The final sample contained 16 unique studies that met all inclusion criteria.

## Measures and Procedures

We used the Quality of Health Economic Studies (QHES<sup>20</sup>) to assess the quality of the economic analyses. It contains 16 dichotomous items (yes or no), each assigned points ranging from 1 to 9. Items assessed

1. the clarity of stated objectives and data abstraction methods,
2. the rigor of study design and timeline,
3. the appropriateness of measures (e.g., health indices, cost units) and analyses,
4. the adequacy of methods employed to reduce bias, and
5. the consistency of conclusions drawn from results.<sup>21</sup>

We awarded items receiving “yes” responses the complete point value, whereas we awarded items receiving “no” responses no points. We combined item values to generate

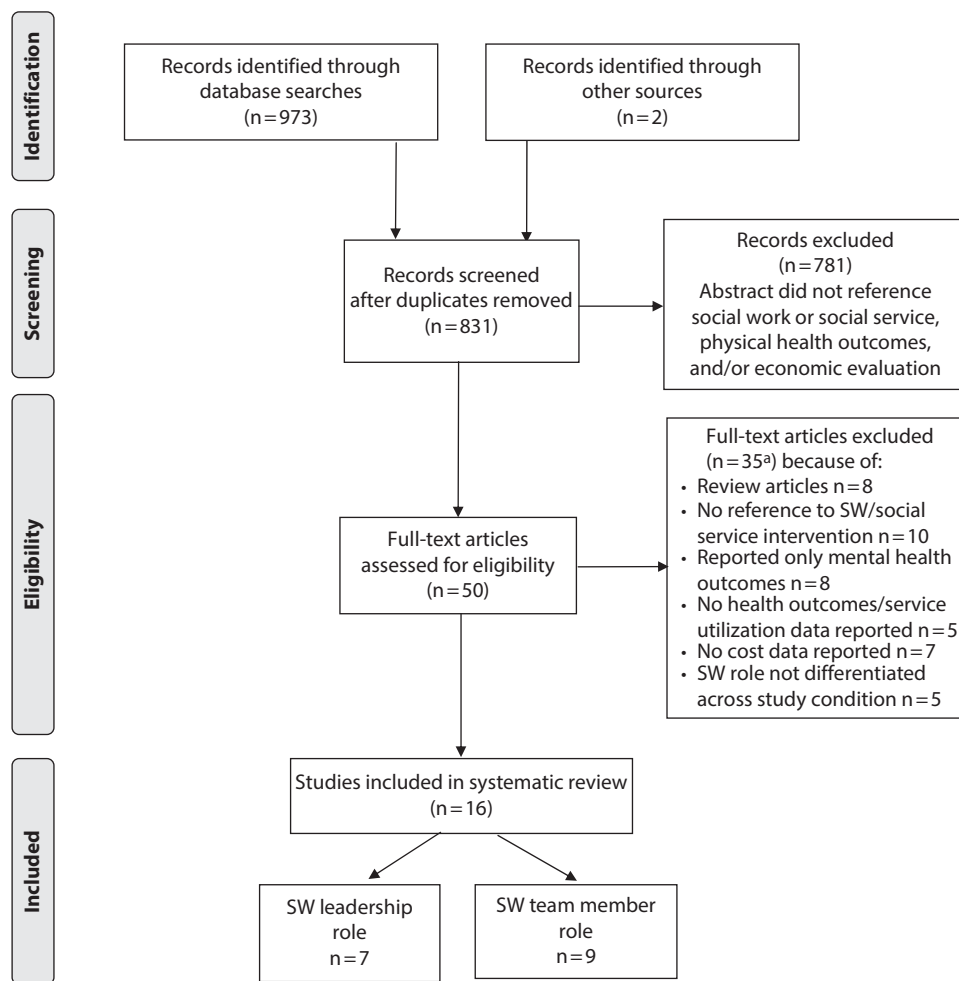
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Note. SW = social work.

<sup>a</sup>Eight articles met multiple exclusions.

**FIGURE 1—PRISMA Study Flow for Research on Social Work Services, Health Outcomes, and Economic or Cost Evaluation**

a total score ranging from 0 to 100; higher scores indicate higher study quality. Reliability and validity of the QHES has been established in studies of nurses and physicians.<sup>20,21</sup> For this study, 2 raters (A. R., M. W.) independently rated all studies by using previously established scoring conventions.<sup>21</sup> Raters achieved perfect agreement on 9 of 16 QHES items; κ coefficients<sup>22</sup> for the remaining items ranged from 0.60 (95% confidence interval [CI] = 0.13, 1.07) to 0.85 (95% CI = 0.56, 1.14). Discrepancies were resolved through consensus to yield a single QHES score for each study. We used total QHES scores to classify each study into quartiles per Spiegel et al.<sup>23</sup> (high: 75–100; fair: 50–74; poor: 25–49; extremely poor: 0–24).

### Analysis

**Study classification.** The substantial variability in study designs, populations, interventions, and reported outcomes prevented the use of meta-analytic methods. Accordingly, we employed the PICOS framework<sup>24</sup> (population/problem, intervention, comparison, outcomes, and study design). PICOS has been widely used for meta-analyses and evidence-based approaches for identifying research gaps during systematic reviews.<sup>25</sup> Two raters (A. R., M. W.) independently classified studies on PICOS variables, including population or problem studied; social work intervention role (leader vs interdisciplinary team member); type of comparison group; health, utilization, and

cost or economic outcomes; and study design. We classified cost analyses as cost savings (decreases or increases in program costs), cost-effectiveness (program costs in relation to intended outcomes), and cost-benefit (comparison of program costs to the monetary value of measured program benefits, including intended outcomes).<sup>26</sup>

**Comparative quality assessment analyses.** We compared study quality via general linear modeling for population or problem groups (maternal and child, adult, elders) and via independent sample *t* test for level of social worker involvement in services (leader vs team member). We conducted all analyses in SPSS version 24.0 (IBM, Somers, NY).

## RESULTS

Studies included in this review represented 3 main population or problem areas: maternal and child health (4 studies), vulnerable low-income adults (8 studies), and geriatric (4 studies). Table 1 is organized accordingly and within each population or problem, studies are ordered by social work leader versus team role, and then by QHES score. Table 1 provides information about study design, sample demographics and settings, interventions compared, economic assessment methods, study quality ratings, and health, utilization, and cost outcomes. Table A (available as a supplement to the online version of this article at <http://www.ajph.org>) provides brief summaries of each study.

### Study Designs and Methods

As Table 1 shows, 12 (75%) of the 16 studies used controlled comparison designs: 7 were randomized controlled trials comparing patients who received the intervention with those receiving usual care, and 5 studies used rigorous designs with a usual care or matched comparison group (prospective cohort study,<sup>28</sup> cross-sectional retrospective matched comparison,<sup>29,30,32</sup> randomized controlled cohort trial<sup>41</sup>). Overall, these were reasonably strong designs. All of the maternal and child and geriatric studies used controlled comparisons, but only 4 of 8 vulnerable adult studies compared interventions with usual care or matched controls. The remaining 4 used cross-sectional<sup>36</sup> or longitudinal<sup>37</sup> retrospective comparisons, a prospective cohort design,<sup>34</sup> and an open pilot trial.<sup>33</sup> Study duration and follow-up assessments varied from a few months to 5 years for assessment of cost outcomes.

It is noteworthy that more than half ( $n = 9$ ) of the studies did not report specific health outcomes, relying instead on use of services (hospital or clinic) as a proxy for health outcomes. Among those that did report actual health outcomes, 3 maternal and child studies assessed number of asthma symptom-free days,<sup>27</sup> number of births,<sup>28</sup> and birth weight as well as newborn Apgar scores.<sup>30</sup> Four studies of vulnerable adults and geriatric patients examined mortality rates,<sup>32,35</sup> rates of serious infections,<sup>37</sup> and number of symptoms.<sup>41</sup> In contrast to the limited reporting of health status, all but 1 study<sup>28</sup> reported

utilization outcomes, with several using these data to compute cost savings.<sup>18,31,36,38</sup> Most utilization outcomes focused on the frequency of care utilization with the goal of reducing clinic and emergency department visits, hospital admissions, and length of stay. Two studies sought to increase utilization (e.g., of vocational rehabilitation services<sup>34</sup> and case management services<sup>40</sup>) to decrease other health costs.

Cost savings was used in 13 (81%) of the 16 studies, with 2 studies each using cost-effectiveness<sup>18,27</sup> or cost-benefit analysis,<sup>28,34</sup> and only 1 study<sup>28</sup> used both cost-benefit and cost-savings analyses. The majority of studies ( $n = 10$ ) examined cost from the provider perspective; 2 employed a patient perspective,<sup>35,39</sup> and 1 reported from a societal perspective.<sup>34</sup> Three studies analyzed multiple perspectives (patient and provider<sup>31,36</sup>; societal and provider<sup>34</sup>). Half of the study sample reported person-level costs, and the remainder reported aggregate costs of a specific program or savings to society over a specified length of time.

### Sample Demographics and Study Settings

The 16 studies spanned a wide range of populations and problems. The 4 studies of maternal and child health interventions focused on asthma management in young children,<sup>27</sup> pregnancy prevention,<sup>28</sup> and reducing neonatal health problems among high-risk pregnant women<sup>29</sup> and pregnant adolescents.<sup>30</sup> The 8 studies of vulnerable adult samples examined medical or social problems, including homelessness among those with chronic medical illness,<sup>31</sup> mild stroke,<sup>18</sup> chronic illness-related work absences,<sup>34</sup> soft tissue infections,<sup>37</sup> under- or uninsured adults using medication assistance,<sup>36</sup> risk for admission to skilled nursing facilities,<sup>35</sup> and high rates of use of inpatient<sup>32</sup> and emergency<sup>33</sup> services. Studies of elderly patients examined interventions for hospitalized medical patients<sup>38</sup> and previously hospitalized high-risk patients treated in the community.<sup>39,40,41</sup>

Sample sizes also ranged widely from a low of 12 to a high of more than 6000. Four studies examined fewer than 105 participants, 6 studies had samples from 200 to 600, and 6 studies had very large samples exceeding

1000 participants. Hospital settings were the most frequent location for service delivery, source of referral, or both for 10 of these 16 studies aimed at reducing health costs. Six studies delivered services through managed or primary care outpatient clinics and several provided services in multiple locations, including community and home and school settings.

### Social Work Services

Raters determined that study interventions involving social workers fell into 2 main categories, with social workers as lead or primary service provider ( $n = 7$ ) or interdisciplinary team member ( $n = 9$ ). In the first category, social workers were the main or only intervention provider or coordinated a team of providers to achieve the intervention goals. For example, social workers served as early detection specialists, care coordinators, and case managers, and led child and caregiver education groups in a study of child asthma.<sup>27</sup> In a pregnancy prevention intervention for adolescent mothers, social workers led support groups, provided intensive case management with home visits and phone contact, and coordinated services with the primary care physician.<sup>28</sup> Other lead roles included facilitating intervention groups and providing hospital and housing-based case management for homeless adults with chronic diseases<sup>31</sup> and providing all services for adults with mild stroke, including assessment, problem solving around services, advocacy, counseling, caregiver support, and referral.<sup>18</sup> In some cases, social workers led an integrated care team, collaborating with medical staff, caregivers, and community providers, and assessing risk and developing an integrated health plan for frequently hospitalized adults<sup>32</sup> and adults with high rates of use of medical services.<sup>33</sup>

As core members of interprofessional teams providing preventive interventions and innovations to improve delivery of care, social workers provided an array of case management services in conjunction with nurses, physicians, physician assistants, pharmacists, and in some cases specialized (e.g., substance abuse) counselors and administrative staff.<sup>37</sup> They completed risk and needs assessments, planning and goal formulation, education, direct outreach to patients at

TABLE 1—Characteristics of International Studies Published From 1990 to May 2017 on Effects of Social Work Services on Health and Cost Outcomes

Study	Study Design and Study Duration	Sample Demographics and Study Setting	Intervention and Comparison Groups	Economic Method	OHES Score and Quartile	Health Outcomes	Utilization Outcomes	Cost Outcomes
<b>Pediatric and maternal and child health populations (4 studies)</b>								
Social worker-led Sullivan et al. <sup>27</sup>	RCT 2 y	Children aged 5–11 y with asthma and their families n = 1032 (n = 515 intervention; n = 518 control); hospital and community	Asthma education and environmental control to facilitate community resource referrals, identify asthma triggers, improve access to care, and educate families about physician's asthma care plan; usual care	Cost-effectiveness <sup>3</sup>	87 (high)	Intervention led to more symptom-free days than usual care (565.1 vs 538.1)	Yes—used to compute cost-savings analysis; no significant differences between groups in rate of physician visits, hospital admissions, and ED visits	Costs were \$245/person higher for children in the intervention compared with control group in the first year
Key et al. <sup>28</sup>	Prospective cohort study 2–3 y	Adolescent mothers n = 314 (n = 63 intervention; n = 252 control); school and home-based	School based intervention and home-visits (group meetings, CM, coordinated medical care); propensity-matched comparison group	Cost-benefit; cost savings	58 (fair)	Intervention led to fewer births compared with control group (17% vs 33%)	Not reported	Intervention led to \$19 097 cost savings per birth avoided (\$5055 per month)
<b>Social worker on interdisciplinary team</b>								
Stankaitis et al. <sup>29</sup>	Cross-sectional; retrospective chart review comparison 4 y	High-risk pregnant women (n = 6000 live births over 6 y); Medicaid managed care program	Identification and stratification of high-risk women via health risk assessment form, multidisciplinary outreach, managed care; usual care	Cost savings	57 (fair)	Not reported	Intervention reduced NICU admissions more than usual care (56.7 vs 107.6 per 1000 births)	Program enhancements led to 4-y cost NICU overall savings of \$1 875 463 and ~\$2 return on investment per \$1 spent
Blackhurst et al. <sup>30</sup>	Cross-sectional retrospective comparison 1 y	Adolescent mothers n = 1233 (n = 922 intervention; n = 311 control); hospital and home	1-y TPP; parent neonatal classes, nutrition counseling, SW evaluation, CM, postpartum home visit; usual care	Cost savings	41 (poor)	TPP led to improved 5-min Apgar scores < 8 (4.3% vs 6.6%) and birth weight < 2500 g (12.2% vs 21.5%)* vs usual care	TPP reduced NICU admissions rate compared with usual care (10.5% vs 16.4%)	TPP led to overall cost savings of \$894 195

Continued

TABLE 1—Continued

Study	Study Design and Study Duration	Sample Demographics and Study Setting	Intervention and Comparison Groups	Economic Method	OHES Score and Quartile	Health Outcomes	Utilization Outcomes	Cost Outcomes
<b>Vulnerable adult populations (8 studies)</b>								
Social worker-led Basu et al. <sup>31</sup>	RCT 18 mo	Homeless adults with chronic medical illness n = 407 (n = 207 intervention; n = 206 control); hospital and community	CM plus HF services; usual care	Cost savings <sup>a</sup>	81 (high)	Not reported	Yes—used to compute cost-savings analysis	CM/HF showed annual savings of \$6307/person; most savings for chronically homeless (\$9809/person) and HIV patients (\$6622/person)
Claiborne <sup>18</sup>	RCT 10 mo	Adults with diagnosis of mild stroke n = 28 (n = 16 intervention; n = 12 control); hospital	Care coordination and treatment (mental health assessment, crisis intervention, caregiver support, CM); usual care	Cost-effectiveness	59 (fair)	Not reported	Yes—used to compute cost-savings analysis	Intervention led to average cost savings of \$1339/person compared with usual care in 1-y
Weerahandi et al. <sup>32</sup>	Retrospective cohort study 2 y	Adult high user inpatients (≥1 in past month or ≥2 in past 6 mo); n = 1158 (n = 579 intervention; n = 579 control); community	PACT: collaborative care team to reduce 30-d hospital readmission rates; matched controls	Cost savings	58 (fair)	Within 30 d of enrollment, 1 death in PACT patients vs 13 in controls	Significantly reduced readmission rates at 30, 60, and 90 d, but not 180 d	Intervention led to overall cost savings of \$900 000; lower 30-d costs for PACT (\$2.7 million) vs controls (\$3.6 million)
Rose et al. <sup>33</sup>	Open pilot trial 3 y	High-risk adults frequenting ED (n = 12 completers); family practice	ED-based collaborative care planning intervention	Cost savings	57 (fair)	Not reported	Pre-post inpatient visits decreased from 98 to 50 (49%); ED visits decreased from 66 to 63 (5%)	Overall cost savings of \$107 808/y for combined hospitalization and ED visits
Social worker on interdisciplinary team Timpka et al. <sup>34</sup>	Prospective cohort study 1 y	Adults with minor illness and long-term absence from work (n = 239); outpatient tertiary care hospital	Tertiary care team-based clinical CM for vocational rehabilitation	Cost-benefit <sup>a</sup>	71 (fair)	Not reported	Vocational rehab rate was 20.5% at 1 y and 11.3% at 5 y	Team-based CM led to £2 500 000 cost savings to society after 5 y

Continued

TABLE 1—Continued

Study	Study Design and Study Duration	Sample Demographics and Study Setting	Intervention and Comparison Groups	Economic Method	OHES Score and Quartile	Health Outcomes	Utilization Outcomes	Cost Outcomes
Eggert et al. <sup>35</sup>	RCT 2 y	Adults aged older than 18 y at risk for admission to SNF (n = 563 (n = 273 intervention; n = 203 control); community and home	Neighborhood team CM model plus direct services (assessment, nursing care, education, counseling, reassessment) Individual CM as usual (assessment, care plan, reassessment) by hospitals and home health agencies	Cost savings	61 (fair)	No differences in mortality rates between groups (41% vs 47%); trend toward lower mortality rate for team vs individual CM group year 2	No significant differences in no. of admissions between groups; one third shorter length of stay for team cases vs controls (19 vs 28 d per admission)	Team CM group averaged \$9.81/ person (14%) lower estimated costs vs controls
Weiner et al. <sup>36</sup>	Cross-sectional; retrospective comparison study 6 mo	Under- or uninsured adults utilizing a medication assistance program (n = 231); hospital	Medication assistance program for patients who lack insurance coverage or resources to pay for medications	Cost savings	28 (poor)	Not reported	Yes—used to compute cost-savings analysis	Medication program led to overall \$237 985 savings (13% from pharmaceutical companies; 63% from Medicaid)
Harris and Young <sup>37</sup>	Longitudinal cohort study; retrospective comparison study 1 y	Adults with soft tissue infections (n = 2861); hospital	ISIS clinic (coordinated surgical intervention and wound care, substance abuse counseling, social services)	Cost savings	28 (poor)	ISIS reduced number of infections requiring surgery by 70% (977 preclinic vs 286 postclinic)	ISIS reduced costs of ED visits (33.9%), surgical admissions (47.3%), inpatient bed days (33.7%), OR use (71%)	ISIS led to \$8 765 200 overall cost savings over 1 y
<b>Geriatric populations (4 studies)</b>								
Social worker-led Toseland and Smith <sup>38</sup>	RCT 2 y	Spouse or caregivers of hospitalized elders who had various health concerns (n = 105); HMO setting	Caregiver HEP emotion-focused coping, education, and support; 8 weekly group sessions and 10 monthly follow-ups; usual care	Cost savings	68 (fair)	Not reported	Yes—used to compute cost-savings analysis	HEP caregivers and recipients overall cost savings was \$309 461 for 2 y

Continued



TABLE 1—Continued

Study	Study Design and Study Duration	Sample Demographics and Study Setting	Intervention and Comparison Groups	Economic Method	OHES Score and Quartile	Health Outcomes	Utilization Outcomes	Cost Outcomes
Social worker on interdisciplinary team Rich et al. <sup>39</sup>	RCT 1 y	High-risk previously hospitalized for congestive heart failure n = 282 (n = 142 intervention; n = 140 control); hospital and community	Community-based comprehensive patient and family education, social-service consultation and early discharge planning, review of medications, intensive follow-up; usual care	Cost savings	56 (fair)	Not reported	Intervention group had significant (56.2%) reduction in 90-d readmission rate*	Intervention reduced total care cost by \$460/person compared with usual care
Boult et al. <sup>40</sup>	RCT 1 y	High-risk elders enrolled in Medicare Choice insurance plans n = 6409 (n = 3480 intervention; n = 2929 control); in 35 primary care practices	IEI program (1-y screening and referral); usual care (no screening)	Cost savings	50 (fair)	Not reported	IEI program used significantly more CM services	IEI program reduced average payments for health care by \$107/person vs usual care
Sommers et al. <sup>41</sup>	Randomized controlled cohort trial 2 y	Elders with chronic illnesses n = 583 (n = 280 intervention; n = 263 control); in 18 primary care practices	SCC program: in-home risk screening, risk-reduction plan, ongoing telephone monitoring, small group meetings or home visits every 6 weeks; usual care	Cost savings	32 (poor)	SCC group had fewer symptoms (17.9–18.9 vs 17.2–17.7) and slight (nonsignificant) health improvement	SCC decreased readmissions (6% to 4%) vs usual care increase (4% to 9%)*; office visits fell by 1.5 visits	SCC led to cost savings of \$90/person in 1 y

Note. CM = case management; ED = emergency department; HEP = health education program; HF = Housing First; HMO = health management organization; IEI = identification and early intervention; ISIS = Integrated Soft Tissue Infection Services; NICU = neonatal intensive care unit; OR = operating room; PACT = Preventable Admissions Care Team; QHES = Quality of Health Economic Studies; RCT = randomized controlled trial; SCC = Senior Care Connections; SNF = skilled nursing facility; TPP = teen pregnancy program.

\*Sensitivity analysis included.

\* P < .05.



care settings, communicating with health practitioners on behalf of clients, discharge planning and referrals for needed services, ongoing monitoring, and advocacy. These roles were not dissimilar to those in the social worker–led services, but were shared across members of the team. These studies examined neighborhood service delivery models, and often included home visits for assessment and intervention. Unfortunately, 5 studies<sup>29,34,35,37,39</sup> did not report the specific roles and tasks of social workers implying that although there was some division of labor, tasks were not discipline–specific. What is clear from both social work–led and team participation is that social workers engaged in a wide variety of tasks and roles.

### Study Quality

Across all studies, the average total QHES scores demonstrated fair study quality (55.25; SD = 17.08) with a range from 87 (good) to 28 (poor; Table 1). Two studies were rated good quality (top quartile),<sup>27,31</sup> 10 were rated fair (second quartile),<sup>18,28,29,32–35,38–40</sup> and 4 were poor (third quartile)<sup>30,36,37,41</sup>; none was rated very poor (bottom quartile). A comparison of mean scores of the studies in each population group (maternal and child, adult, geriatric) using general linear modeling indicated no significant differences among study populations ( $P = .76$ ; range = 47–58.5). However, average QHES scores were significantly higher in the 7 studies with social workers as leaders or sole providers (mean = 66.85; SD = 12.40; range = 57–87) compared with the 9 studies with social workers as team members (mean = 46.22; SD = 14.91; range = 28–71;  $t(14) = 2.95$ ;  $P = .011$ ).

### Health and Service Utilization Outcomes

All studies evaluating maternal and child interventions indicated positive health or utilization outcomes. This was evident in symptom–free days for an asthma intervention program; children with more severe symptoms showed lower utilization compared with controls.<sup>27</sup> Interventions for adolescent and at-risk mothers increased contraception use and reduced births compared with controls,<sup>28</sup> improved neonatal birth weight and functioning scores,<sup>30</sup> and

reduced NICU admission rates<sup>29</sup> compared with controls. Findings from the 3 vulnerable adult studies reporting specific health outcomes included a much reduced death rate (1 vs 13) for frequently hospitalized adults compared with matched controls<sup>32</sup> and 70% fewer serious tissue infections,<sup>37</sup> but no improvement in 1-year mortality rates for adults at risk for nursing home admission.<sup>35</sup> Reduced service utilization was fairly common among studies of adults, evident for homeless chronically ill adults,<sup>31</sup> survivors of mild stroke,<sup>18</sup> underinsured adults needing medication assistance,<sup>36</sup> and those with soft tissue infections.<sup>37</sup> However, findings for emergency department, inpatient, and nursing home use were mixed, with 2 studies showing early gains that did not persist,<sup>32,34</sup> another indicating reductions in inpatient admissions but not emergency visits,<sup>33</sup> and a third reporting shorter stays but no reduction in nursing home admissions.<sup>35</sup> For geriatric patients, 3 studies showed declines in postintervention care utilization for patients with severe heart conditions,<sup>39</sup> elders with chronic diseases,<sup>41</sup> and caregivers of hospitalized elders.<sup>38</sup> In the fourth study, increased use of case management services helped reduce health care costs and increase satisfaction and quality of life compared with usual care.<sup>40</sup> Thus, although there was some variability, overall, the findings for health care utilization were positive.

### Cost Outcomes

Nearly all studies reported improved cost savings attributed to the interventions. Three maternal and child health studies reported substantial cost savings for at-risk pregnant women and adolescents<sup>28–30</sup> with benefits rising into the millions for large-scale studies. Although the asthma management showed higher costs after intervention, the social work–led intervention significantly improved asthma symptoms for a relatively modest increase in costs.<sup>27</sup> All 8 studies of vulnerable adults reported cost savings, cost-effectiveness, or positive benefit–cost ratios from intervention programs; only 1 showed limited gains (approximately \$10 per person) for adults at risk for nursing home placement.<sup>35</sup> Examples of savings included a housing program that included case management services, which saved more than

\$6000 per person per year in health, housing, and respite care costs and annual savings of nearly \$10 000 for chronically homeless patients.<sup>31</sup> Other studies showed high aggregate cost savings of prevention and intervention efforts compared with controls ranging from \$230 000 over 6 months<sup>36</sup> to \$1 million over 1 month<sup>32</sup> and \$8.76 million for 1 year.<sup>37</sup> Similar cost savings were reported in geriatric studies. Per-patient cost reductions in 3 studies ranged from \$90 per patient over 1 year<sup>41</sup> to \$460 over a 3-month follow-up period.<sup>39</sup> In the latter study, control group hospital readmission costs were more than \$1000–per-patient higher over the same time period.

### DISCUSSION

This systematic review of research over the past 27 years sheds some light on social work roles and outcomes in services provided for health problems. Expanding upon earlier reviews by Rizzo et al. with elderly populations,<sup>9,16</sup> the current review also included social work–involved interventions for high-risk children, pregnant women, and vulnerable adults, most with chronic health conditions. In these studies, social workers delivered a variety of direct services as the primary or sole provider or leader or as a core team member. The diversity of social work roles and tasks within and across health interventions and practice settings was amply illustrated in the many and varied services provided, often expanding upon traditional social work services to manage disease (e.g., case management, discharge planning). Unfortunately, 5 of the studies failed to specify the unique aspects of the social workers' activities, making it difficult to provide direct guidelines to clinicians and researchers for replicating positive health and cost outcomes.<sup>42</sup> It is noteworthy that most interventions were predominantly secondary rather than primary prevention efforts designed to prevent disease progression and reduce the use of costly health services.

To our knowledge, this study is the first of its kind to include study quality ratings using a reliable and valid tool (QHES<sup>20</sup>). Per established guidelines,<sup>23</sup> most of these studies ( $n = 10$ ) were classified as “fair,” with 2 rated “good” and 4 “poor.” Interestingly,

a recent review of nursing interventions employing the QHES<sup>21</sup> yielded more studies, but they appeared to be classified as “poor” and “very poor” more often than these social work studies. However, our scoring system may have inflated some QHES scores as service utilization was awarded full points for the QHES item assessing the adequacy of the study timeframe to evaluate health outcomes.<sup>21</sup> Overall, allied health professionals could benefit from cross-disciplinary efforts to increase methodological rigor in assessing service effects on health and economic outcomes.

With regard to social work roles, 2 studies in the top quartile included interventions led by social workers,<sup>27,31</sup> whereas in all of the studies classified as “poor quality,” social workers functioned as interdisciplinary team members. Moreover, average QHES scores were significantly higher for the 7 studies in which social workers led compared with the 9 studies in which social workers were team members. While encouraging, these results must be interpreted with caution. The QHES instrument assesses study quality only; effect sizes or margins of economic gain were not evaluated. Thus, conclusions about the magnitude of health gains or economic efficiency attributable to social workers or their care roles cannot be drawn from these statistical analyses.

Overall, findings from this review indicated that interventions involving social workers, whether through sole delivery, team leadership, or core membership on interprofessional teams, had positive effects on health outcomes and were less costly than usual care that did not include substantial social work services. These findings held across populations, health problems, and settings. With regard to health effects, 11 of the 16 studies indicated positive outcomes or reduced utilization of services for the identified problem. Five reported mixed effects, and none reported negative health outcomes. Cost outcomes were particularly positive, as 15 of the 16 studies indicated positive economic effects of interventions involving social workers. Future research might include social work–led interventions in stepped-care approaches, as well as corrective interventions for those with various levels of illness severity.

The economic and health benefits reported in these studies suggest that the broad

purview of the social work discipline with regard to patients’ personal and environmental needs may be particularly valuable for achieving original ACA goals of cost containment, prevention, and population health. The diversity of roles across these studies speaks to the versatility of social workers in addressing emotional, behavioral, and cognitive needs of patients and family members to reduce illness and promote health. At the same time, this range of skills challenges efforts to develop standardized metrics to assess activities that contribute to patient and population-level outcomes. Research is needed to develop such metrics and to specify outcomes that are applicable across health settings to facilitate cross-study comparisons. In fact, none of these studies directly compared social work involvement in care to the absence of social work involvement. This is not surprising given that team-based care is germane to social work.<sup>43</sup> Two basic hypotheses remain to be tested on behalf of the profession:

1. Clinical health services led by social workers provide added benefit beyond services that do not involve a social work leader.
2. Inclusion of social workers on interprofessional care teams enhances health and cost outcomes beyond care provided without social worker involvement.

Such studies will require considerably greater specificity in measurement of tasks and roles across health disciplines.

Among the limitations of this review is the absence of direct measures of health outcomes and the limited methodology for cost analyses. Many studies reported service utilization data as a proxy for either health outcomes or cost calculations, and the lack of consistency introduces confusion about the findings. For example, number of outpatient visits may indicate higher costs or worse health outcomes in some studies, but also appropriate use of lower-cost services that reduce use of more expensive services. In addition, the use of mainly cost-savings analyses does not account for inflation, and consistency in reporting both per-person and aggregate costs is needed for ease of comparison.

This systematic review was intentionally restricted to an examination of social work

services and our methodology therefore used the search term “social work.” Efforts to locate additional studies through related terms (e.g., case management) did not yield more articles that met criteria. Accordingly, we are reasonably confident that this relatively limited body of research is representative of published studies of social work involvement in delivering health services, although publication bias and self-censorship may limit access to relevant research. Unfortunately, although social workers have been encouraged to take leadership roles in translational research in behavioral health,<sup>5</sup> only 4 of the studies included here were authored by social workers. Clearly, a similar call is needed to encourage social work researchers to take the lead in developing and testing intervention and prevention efforts to improve health outcomes and costs. As health service delivery focuses increasingly on interprofessional training and practice and integrated care, it behooves the profession to aggressively test the impact of those efforts on the health and well-being of vulnerable populations and the associated costs and benefits to society. **AJPH**

#### CONTRIBUTORS

G. Steketee conceptualized the research questions and oversaw conduct of the research, and wrote the majority of the content. A. M. Ross and M. K. Wachman conducted article search, ratings, analyses, and review. All authors contributed to the writing of the article.

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Human participant protection was not required because this study did not include human participants.

#### REFERENCES

1. Sekhri NK. Managed care: the US experience. *Bull World Health Organ.* 2000;78(6):830–844.
2. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff (Millwood).* 2008; 27(3):759–769.
3. Koh HK, Sebelius KG. Promoting prevention through the Affordable Care Act. *N Engl J Med.* 2010;363(14): 1296–1299.
4. Golden RL. Coordination, integration, and collaboration: a clear path for social work in health care reform. *Health Soc Work.* 2011;36(3):227–228.

5. Brekke J, Ell K, Palinkas L. Translational science at the National Institute of Mental Health: can social work take its rightful place. *Res Soc Work Pract.* 2007;17(1):123–133.
6. Mullen E, Shuluk J. Outcomes of social work intervention in the context of evidence-based practice. *J Soc Work.* 2011;11(1):49–63.
7. Olsson M, Marcus SC, Druss B, Pincus HA. National trends in the use of outpatient psychotherapy. *Am J Psychiatry.* 2002;159(11):1914–1920.
8. Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, Brief Intervention, and Referral to Treatment (SBIRT): toward a public health approach to the management of substance abuse. *Subst Abuse.* 2007;28(3):7–30.
9. Rizzo V, Rowe J. Studies of the cost-effectiveness of social work services in aging: a review of the literature. *Res Soc Work Pract.* 2006;16(1):67–73.
10. Shier G, Ginsburg M, Howell J, Volland P, Golden RL. Strong social support services, such as transportation and help for caregivers, can lead to lower health care use and costs. *Health Aff (Millwood).* 2013;32(3):544–551.
11. McGregor J, Mercer S, Harris F. Health benefits of primary care social work for adults with complex health and social needs: a systematic review. *Health Soc Care Community.* 2016;(1):1–13.
12. Keefe RH. Health disparities: a primer for public health social workers. *Soc Work Public Health.* 2010;25(3):237–257.
13. Bristow DP, Herrick C. Emergency department case management: the dyad team of nurse case manager and social worker improve discharge planning and patient and staff satisfaction while decreasing inappropriate admissions and costs: a literature review. *Lippincott Case Manag.* 2002;7(6):243–251.
14. Popejoy LL, Moylan K, Gambos C. A review of discharge planning research of older adults (1990–2008). *West J Nurs Res.* 2009;31(7):923–947.
15. Manthorpe J, Martineau S. Followers or leaders? What is the role of social work practitioners in annual health checks for adults with learning disabilities? *J Intellect Disabil.* 2010;14(1):53–66.
16. Rizzo V, Rowe J. Cost-effectiveness of social work services in aging: an updated systematic review. *Res Soc Work Pract.* 2016;1:1–15.
17. Shields L, Zhou H, Pratt J, Taylor M, Hunter J, Pascoe E. Family-centered care for hospitalized children ages 0–12. *Cochrane Database Syst Rev.* 2012;10:CD004811.
18. Claiborne N. Efficiency of a care coordination model: a randomized study with stroke patients. *Res Soc Work Pract.* 2006;16(1):57–66.
19. Higgins J, Lasserson T, Chandler J, Tovey D, Churchill R. Methodological expectations for the conduct of Cochrane Intervention Reviews (MECIR). Version 2.2. London, England: The Cochrane Editorial Unit; 2016.
20. Ofman JJ, Sullivan SD, Neumann PJ, et al. Examining the value and quality of health economic analyses: implications of utilizing the QHES. *J Manag Care Pharm.* 2003;9(1):53–61.
21. Marshall D, Donald F, Lacny S, et al. Assessing the quality of economic evaluations of clinical nurse specialists and nurse practitioners: a systematic review of cost-effectiveness. *Nursing Plus Open.* 2005;1:11–17.
22. Cohen J. A coefficient of agreement for nominal scales. *Educ Psychol Meas.* 1960;20(1):37–46.
23. Spiegel BM, Targownik LE, Kanwal F, et al. The quality of published health economic analyses in digestive diseases: a systematic review and quantitative appraisal. *Gastroenterology.* 2004;127(2):403–411.
24. Higgins J, Green S. *Cochrane Handbook for Systematic Reviews of Interventions.* Version 5.1.0. London, England: The Cochrane Collaboration; 2011.
25. Robinson KA, Saldanha IJ, McKoy NA. Development of a framework to identify research gaps from systematic reviews. *J Clin Epidemiol.* 2011;64(12):1325–1330.
26. Cellini S, Kee J. Cost-effectiveness and cost-benefit analysis. In: Wholley J, Hatry H, Newcomer K, eds. *Handbook of Practical Program Evaluation.* 3rd ed. San Francisco, CA: Jossey-Bass; 2010:493–530.
27. Sullivan SD, Weiss KB, Lynn H, et al. The cost-effectiveness of an inner-city asthma intervention for children. *J Allergy Clin Immunol.* 2002;110(4):576–581.
28. Key JD, Gebregziabher MG, Marsh LD, O'Rourke KM. Effectiveness of an intensive, school-based intervention for teen mothers. *J Adolesc Health.* 2008;42(4):394–400.
29. Stankaitis JA, Brill HR, Walker DM. Reduction in neonatal intensive care unit admission rates in a Medicaid managed care program. *Am J Manag Care.* 2005;11(3):166–172.
30. Blackhurst DW, Gailey TA, Bagwell VC, et al. Benefits from a teen pregnancy program: neonatal outcomes potential cost savings. *J S C Med Assoc.* 1996;92(5):209–215.
31. Basu A, Kee R, Buchanan D, Sadowski LS. Comparative cost analysis of housing and case management program for chronically ill homeless adults compared to usual care. *Health Serv Res.* 2012;47(1 pt 2):523–543.
32. Weerahandi H, Lipani M, Kalman J, et al. Effects of a psychosocial transitional care model on hospitalizations and cost of care for high utilizers. *Soc Work Health Care.* 2015;54(6):485–498.
33. Rose SM, Hatzenbuehler S, Gilbert E, Bouchard M, McGill D. A population health approach to clinical social work with complex patients in primary care. *Health Soc Work.* 2016;41(2):93–100.
34. Timpka T, Leijon M, Karlsson G, Svensson L, Bjurulf P. Long-term economic effects of team-based clinical case management of patients with chronic minor disease and long-term absence from working life. *Scand J Soc Med.* 1997;25(4):229–237.
35. Eggert GM, Zimmer J, Hall WJ, Friedman B. Case management: a randomized controlled study comparing a neighborhood team and a centralized individual model. *Health Serv Res.* 1991;26(4):471–507.
36. Weiner S, Dischler J, Horvitz C. Beyond pharmaceutical manufacturer assistance: broadening the scope of an indigent drug program. *Am J Health Syst Pharm.* 2001;58(2):146–150.
37. Harris HW, Young DM. Care of injection drug users with soft tissue infections in San Francisco, California. *Arch Surg.* 2002;137(11):1217–1222.
38. Toseland R, Smith T. The impact of a caregiver health education program on health care costs. *Res Soc Work Pract.* 2006;16(1):9–19.
39. Rich MW, Beckham V, Wittenberg C, Leven CL, Freedland KE, Carney RM. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. *N Engl J Med.* 1995;333(18):1190–1195.
40. Boulton C, Rassen J, Rassen A, Moore RJ, Robison S. The effect of case management on the costs of health care for enrollees in Medicare Plus Choice plans: a randomized trial. *J Am Geriatr Soc.* 2000;48(8):996–1001.
41. Sommers LS, Marton KI, Barbaccia JC, Randolph J. Physician, nurse, and social worker collaboration in primary care for chronically ill seniors. *Arch Intern Med.* 2000;160(12):1825–1833.
42. Fraser M, Lombardi B, Wu S, Zerden L, Richman E, Fraher E. Social work in integrated primary care: a systematic review Health Workforce Policy Brief. Chapel Hill, NC: Carolina Health Workforce Research Center; 2016.
43. Proctor EK, Landsverk J, Aarons G, Chambers D, Glisson C, Mittman B. Implementation research in mental health services: an emerging science with conceptual, methodological, and training challenges. *Adm Policy Ment Health.* 2009;36(1):24–34.