Measuring capacity to use evidence-based interventions in community-based organizations: A comprehensive, scoping review

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Abstract

Introduction: Community-based organizations (CBOs) are well-positioned to incorporate research evidence, local expertise, and contextual factors to address health inequities. However, insufficient capacity limits use of evidence-based interventions (EBIs) in these settings. Capacity-building implementation strategies are popular, but a lack of standard models and validated measures hinders progress in the field. To advance the literature, we conducted a comprehensive scoping review. Methods: With a reference librarian, we executed a comprehensive search strategy of PubMed/Medline, Web of Science Core Collection, and EBSCO Global Health. We included articles that addressed implementation science, capacity-building, and CBOs. Of 5527 articles, 99 met our inclusion criteria, and we extracted data using a double-coding process. Results: Of the 99 articles, 47% defined capacity explicitly, 31% defined it indirectly, and 21% did not define it. Common concepts in definitions were skills, knowledge/expertise, and resources. Of the 57 articles with quantitative analysis, 48 (82%) measured capacity, and 11 (23%) offered psychometric data for the capacity measures. Of the 99 studies, 40% focused exclusively on populations experiencing inequities and 22% included those populations to some extent. The bulk of the studies came from high-income countries. Conclusions: Implementation scientists should 1) be explicit about models and definitions of capacity and strategies for building capacity, 2) specify expected multi-level implementation outcomes, 3) develop and use validated measures for quantitative work, and 4) integrate equity considerations into the conceptualization and measurement of capacity-building efforts. With these refinements, we can ensure that the necessary supports reach CBO practitioners and critical partners for addressing health inequities.

Introduction

As trusted local actors, community-based organizations (CBOs) are well-positioned to incorporate research evidence, local expertise, and contextual factors to improve health [1–4]. These organizations often fill important gaps in reaching populations served ineffectively by traditional healthcare channels and offer a unique opportunity to promote health equity [4,5]. The scale of their potential impact is substantial – CBOs delivered about $200 billion in services in the US in 2017 [6]. The term CBOs refers to mission-driven organizations that address community needs and reflect community values, which are typically nonprofit and led by a board of members, and deliver services in coordination with community stakeholders [7]. While CBOs can be core implementation channels for evidence-based interventions (EBIs), they face several challenges in this regard. Barriers include insufficient training and skills to use EBIs, competing priorities, balancing capacity-building and service delivery, insufficient organizational supports for the use of EBIs, and a lack of clarity around how to sustain successful EBIs [8–12]. These challenges are particularly relevant for CBOs working with communities that have been and/or are currently being marginalized and excluded from opportunities for health and wellbeing, where resource constraints are often heightened [5,9]. Building capacity for EBI use is a critical element of designing for dissemination and implementation, for example, as highlighted by Interactive Systems Framework and the push-pull-capacity model [13,14]. Capacity to use EBIs is a driver of implementation outcomes and, ultimately, health impact and is thus a critical area of focus [10]. Capacity-building to implement EBIs has attracted a fair amount of attention, with successes in increasing the adoption and implementation of EBIs, for example, among the staff of local health departments, policymakers, and some community-based settings [15,16,10].

It is difficult to capitalize on the capacity-building literature given a lack of consensus regarding the definition of capacity as a concept. The World Health Organization describes capacity as...
the “knowledge, skills, commitment, structures, systems, and leadership to enable effective health promotion” [17]. This is echoed by an influential synthesis of the literature on capacity-building for EBI use, which describes capacity as having sufficient structures, personnel, and resources to utilize EBIs [10]. Further expanding potential conceptualizations, frameworks such as the Interactive Systems Framework attend to capacity in the systems integral to putting EBIs into practice, emphasizing general capacity and EBI-specific capacity [14].

Another limitation in the field is a shortage of validated measures of capacity generally [18,19] and for use in CBOs [10]. While the use of reliable and valid measures is integral to advancing knowledge regarding the capacity-building implementation strategies that warrant further attention, most measures have been inadequately assessed for psychometric properties [10,20]. Where validated measures exist, they were often developed for non-CBO practitioners, such as health department staff, and include items that would be irrelevant in CBOs, for example, items that ask about consultations with staff epidemiologists [21]. The measurement gaps matter, as limited data describe the link between capacity-building strategies, capacity, and implementation outcomes [22]. Burgeoning efforts to bridge this measurement gap have yielded essential assessment tools to improve the implementation of EBIs in local settings [21,23]. A final potential gap in the literature relates to the need to tailor capacity-building interventions to adjust for the context in which an EBI will be implemented. On one hand, CBOs serving marginalized populations are recognized as prime partners for delivering EBIs to advance health equity [4,5]. On the other, our previous work highlights a disconnect that practitioners working with marginalized populations perceive between capacity-building interventions and their needs and expertise [24]. We were unable to find an assessment of the extent to which these organizations are present in the capacity-building literature, prompting further attention. Given the importance of increasing CBO capacity to utilize EBIs in the service of improved population health and health equity, we conducted a scoping review to examine the available literature and identify important research gaps. Our study focused on researchers addressing capacity-building for EBI use in CBOs and asked 1) how is capacity defined and conceptualized, 2) to what extent are validated measures available and used, and 3) to what extent is equity a focus in this work? The inquiry is grounded in a systematic review of capacity-building for EBI use in community settings by Leeman and colleagues, which defines capacity as the general and program-specific awareness, knowledge, skills, self-efficacy, and motivation to use an EBI. The review also identified several capacity-building strategies shown to increase adoption and implementation, such as providing technical assistance in addition to training and tools [25]. We have adapted this work to serve as the conceptual framework for this review, as summarized in Fig. 1.

**Materials and Methods**

**Design**

A team of researchers conducted this review. Two of the authors (SR and HMB) have been studying the use of EBIs in community settings for more than 15 years. Three members of the team were students (of public health, medicine, and psychology) (MW, ML, SK), one member manages implementation science projects (SLM), and one member (CM) is a research librarian at Harvard Medical School’s Countway Library. The team had the necessary complementary expertise to conduct the review. We did not register the scoping review given its exploratory nature. The researchers adapted the process described by Katz and Wandersman [26]. We utilized the PRISMA checklist for scoping reviews to support reporting [27] and have provided details as Supplemental File 1.

**Step 1**: Identify the research questions. 1) How are researchers defining and conceptualizing “capacity” and related outcomes to support the use of EBIs in CBOs? 2) To what extent are validated measures available and used? 3) To what extent are capacity-building studies attending to health equity?

**Step 2**: Conduct the search. Relevant studies were identified by searching the following databases: PubMed/Medline (National Library of Medicine), Web of Science Core Collection (Clarivate), and Global Health (C.A.B. International, EBSCO), on August 13, 2021. Controlled vocabulary terms (i.e., MeSH or Global Health thesaurus terms) were included when available and appropriate. The search strategies were designed and executed by a research librarian (CM). No language limits or year restrictions were applied, and bibliographies of relevant articles were reviewed to identify additional studies. We sought articles at the intersection of three core areas: 1) CBOs, 2) evidence-based practice, and 3) capacity-building. The search strategy used in PubMed included the combination of MeSH terms and keywords searched within the title and abstract was as follows:

**Fig. 1. Conceptual framework for the review, adapted from Leeman and colleagues [25].**

**EBI = evidence-based intervention**

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The diagram shows the conceptual framework for the review, adapted from Leeman and colleagues [25]. The framework includes the following components:

- **Capacity-building interventions**
  - Strategies (e.g., training, tools, etc.)
  - Structure (e.g., orientation, dosage)

- **Practitioner-level, general-and EBI-specific capacity**
  - Awareness
  - Knowledge
  - Skills
  - Self-Efficacy
  - Motivation
  - Resources

- **Intervention Planning Behaviors**
  - Assess context
  - Engage team
  - Select EBI
  - Adapt EBI
  - Integrate EBI
  - Evaluate
  - Sustain

- **EBI implementation**

- **Improved population health and health equity**

The framework illustrates the iterative process of planning, implementing, and evaluating EBIs in the context of capacity-building interventions.
pairs of researchers double-coded data for each article, and the first review articles to examine conceptualizations of capacity-building was utilized for the review of full-text articles. We included stage as a team, with mediation by the lead author. The research team reviewed and resolved conflicts at this (editor). The research team reviewed and resolved conflicts at this stage as a team, with mediation by the lead author. The research team reviewed and resolved conflicts at this stage as a team, with mediation by the lead author.

Exclusion criteria were as follows: 1) did not address the capacity of practitioners targeted (e.g., CBO staff), health focus (e.g., obesity prevention), and extent to which the study focused on health equity. We also coded for whether a definition of capacity was offered (directly, indirectly, or not at all). We coded for whether or not capacity was measured. For articles in which capacity was measured quantitatively, we assessed whether or not psychometric data were provided. Finally, we extracted the identified outcomes of capacity-building highlighted by the article.

A few categories deserve further explanation. To describe the health equity focus, the team coded presence or absence of an emphasis on at least one of the following: 1) For US studies, NIH-designated US health disparity populations as defined by NIMCHD [28], including Blacks/African Americans, Hispanics/Latinos, American Indians/Alaska Natives, Asian Americans, Native Hawaiians, and other Pacific Islanders, socioeconomically disadvantaged populations, underserved rural populations, and sexual and gender minorities; 2) other underserved populations from high-income countries (e.g., medically underserved communities, incarcerated populations, disabled populations); and 3) populations from low- and middle-income countries. For articles with a focus on these populations, we also coded whether the study included these populations (e.g., including racial and ethnic minorities as part of a general recruitment effort) or focused on them (e.g., a study that delivered a capacity-building intervention to organizations serving low-income communities).

Step 5. Analyze and summarize the data. Once the dataset was finalized, the data were summarized using descriptive statistics. All analyses were conducted using Microsoft Excel.

Results

Search Results

As seen in Fig. 2, the initial search yielded 5527 articles, 285 full-text articles were screened, and a pool of 99 articles was retained for the review. This process is visualized according to the PRISMA reporting standards [29].

Core attributes of the 99 included articles are presented in Table 1.

As seen in Table 1, the included studies were published between 1997 and 2021. About half (47%) were published between 1997 and 2014 and the remainder from 2015 to August 2021. A total of 80 were based in the US, 9 were from other high-income countries, 2 explicitly referenced findings in low- and middle-income countries, and 8 did not specify.

Question 1: How Did Researchers Define Capacity in the Context of CBO Practitioners using EBIs?

Of the 99 articles, 47 defined capacity explicitly (47%), another 31 defined it indirectly (31%), and 21 did not define it at all (21%). Of those that offered direct or indirect definitions, 34 concepts were described, with an average of 3.3 per article. Common concepts included practitioner-level attributes, for example, knowledge and skills, organization-level attributes, for example, leadership and fiscal resources, and system-level attributes, for example, partnerships and informal systems. Among the concepts that were infrequently mentioned, a few related to the broader functioning of groups, communities, or the larger political environment. Overall, 162 concepts (64% of total) were at the practitioner level, 80 (30%) were at the organization level, and 14 (5%) were at the system-level attributes. Concepts mentioned five or more times are presented in Table 2.

We also examined how researchers linked practitioner capacity and capacity-building efforts to key outcomes at multiple levels and across short- and long-term timeframes (Fig. 3).

Question 2: To What Extent Did Quantitative Studies Measure Capacity, and to What Extent were Psychometric Data Provided?

A total of 57 articles (57%) included quantitative analytic components, and of those, 48 (82%) measured capacity and 11 (23%)
offered psychometric data for the capacity measures. The foci and types of psychometric data presented are summarized below.

1. Acosta and colleagues [30] used a combination of a Getting to Outcomes approach and the Consolidated Framework for Intervention Research [31,32] in this study of positive youth development. They defined practitioner prevention capacity in terms of perceived efficacy (ability to complete necessary tasks on one’s own) and behaviors (conducting the necessary implementation tasks, both related to the approach broadly and the intervention specifically. They offered reliability data for each core capacity scale and drew on previously utilized scales.

2. Allen and colleagues [33] conducted a survey that emphasized the importance of skills, availability of skilled staff, organizational supports, and use of research evidence before and after receiving training on evidence-based decision-making. The team scored the perceived importance of each of the ten key skills and the availability of staff members with that skill. Additionally, measures included frequency of using research evidence and work unit and agency expectations and supports for evidence-based decision-making. Finally, a list of steps taken to enhance capacity for evidence-based decision-making was utilized. The measures were validated through five rounds of review by an expert panel, cognitive testing with former state chronic disease directors, and test-retest reliability assessment with state health department staff.

3. Brock and colleagues [34] examined the capacity for a community advisory board (including CBO representatives) to implement an evidence-based obesity program using participatory processes. They used a 63-item survey to capture 13 domains, including capacity efforts (decision-making, conflict resolution, communication, problem assessment, group roles, and resources); capacity outcomes (trust, leadership, participation and influence, collective efficacy); and sustainability outcomes (sustainability, accomplishments, and community power). They reported reliability data for the survey items.

4. Brown and colleagues [35] described measures as part of a protocol for a hybrid, Type 3 cluster-randomized trial examining coalition and prevention program support through technical assistance. Their measure of coalition capacity included cohesion (e.g., sense of unity and trust) and efficiency (e.g., focus and work ethic) for internal team processes.

5. Chinman and colleagues [31] conducted a study based on the Getting to Outcomes framework. For the capacity assessment, they use 23 items to measure self-efficacy (in terms of how much help would be needed) for Getting to Outcomes activities (e.g., conducting a needs assessment). They conducted a factor analysis and assessed the internal consistency reliability of this scale. A separate set of 16 items examined attitudes towards steps of the program process, for example, conducting a formal evaluation. They conducted a factor analysis and calculated internal consistency reliability.

6. Chinman and colleagues [36] conducted a study with the Getting to Outcomes framework and examined prevention capacity as knowledge and skills. The Knowledge Score averaged seven items and examined how much help the respondent would need to carry out a given prevention activity, for example, supporting program sustainability. Internal consistency reliability data were presented. The Skills Score averaged six items and assessed respondents’ frequency of engaging in the prevention activities; internal consistency reliability data were presented.

7. Chinman and colleagues [37] conducted a trial drawing on the Getting to Outcomes framework and key capacity measures focused on efficacy. A five-item efficacy scale focused on
| Citation | Country and US State(s) if applicable | Target Practitioners | Health focus | Capacity measured | Measure psycho-metrics presented | Health equity focus (None / Close to None, Included, Primary) |
|----------|--------------------------------------|----------------------|--------------|------------------|----------------------------------|-------------------------------------------------------------|
| Acosta et al. 2013 [30] | US - ME | Program staff | Positive youth development | Yes | Yes | None |
| Ai et al. 2021 [62] | US - KS | Program staff | Positive youth development | No | No | None |
| Allen et al. 2015 [63] | US - MA | FBO staff | Cancer control | Yes | No | Primary |
| Allen et al. 2016 [64] | US - MA | FBO staff | Cancer control | No | No | Primary |
| Allen et al. 2018 [33] | US - GA | Multiple | Chronic disease prevention | Yes | Yes | None |
| Allen et al. 2020 [65] | US - MA | FBO staff | Cancer control | Yes | No | Primary |
| Ayala et al. 2007 [66] | US - Western region | CBO staff | HIV prevention | Yes | No | Primary |
| Ayer et al. 2020 [67] | US - NY | Program staff | Mental health | Yes | No | Included |
| Bach-Mortensen et al. 2018 [9] | Multiple countries | Program staff | Multiple | No | No | None |
| Berman et al. 2018 [68] | US - KS, MO | Multiple | Childhood obesity | No | No | Included |
| Bravo et al. 2019 [69] | US - CA | Program staff | Clinical preventive services | No | No | Primary |
| Brock et al. 2019 [34] | US - NC, VA | Community partners | Childhood obesity | Yes | Yes | Primary |
| Brodowski et al. 2013 [70] | US - KS, NE | Program staff | Child abuse and neglect prevention | No | No | None |
| Brown et al. 2005 [72] | US - CA | CBO staff | STI prevention | No | No | Included |
| Brown et al. 2010 [73] | US - PA | Coalition members, Program staff | Risky behavior prevention in youth | Yes | No | Included |
| Brown et al. 2015 [74] | US - PA | Coalition members, Program staff | Crime prevention | Yes | No | Included |
| Brown & Akin 2021 [75] | Scotland | Program staff | General health promotion | Yes | No | Included |
| Cannon et al. 2017 [76] | France | Multiple | Multiple | No | No | None |
| Carroll-Scott & al. 2012 [78] | US - CA | Program staff | Substance abuse prevention | Yes | No | Included |
| Chilenski et al. 2016 [79] | US - IA, PA | Multiple | Not specified | Yes | No | Included |
| Chilenski et al. 2018 [80] | US - IA, PA | Multiple | Youth substance abuse and problem behaviors | Yes | No | Primary |

(Continued)
| Citation               | Country and US State(s) if applicable | Target Practitioners | Health focus                        | Capacity measured | Measure psycho-metrics presented | Health equity focus (None / Close to None, Included, Primary) |
|-----------------------|---------------------------------------|----------------------|-------------------------------------|-------------------|-----------------------------------|------------------------------------------------------------|
| Chinman et al. 2005   | US                                    | Program staff        | Substance abuse prevention          | No                | No                                | None                                                       |
| Chinman et al. 2008   | US - CA, SC                           | Program staff        | Substance abuse prevention          | Yes               | Yes                               | None                                                       |
| Chinman et al. 2012   | US - ME                               | CBO staff            | Substance abuse prevention          | Yes               | Yes                               | None                                                       |
| Chinman et al. 2012   | US - Northeast region                  | Program staff        | Mental health, Homelessness         | No                | No                                | Primary                                                    |
| Chinman et al. 2013   | US - AL, GA                           | Program staff        | STI prevention, Pregnancy prevention| Yes               | No                                | Primary                                                    |
| Chinman et al. 2013   | US - ME                               | Coalition members,   | Positive youth development          | Yes               | Yes                               | None                                                       |
| Chinman et al. 2016   | US - AL, GA                           | Program staff        | STI prevention, Pregnancy prevention| Yes               | No                                | Primary                                                    |
| Chinman et al. 2018   | US - CA                               | Program staff        | Substance abuse prevention          | No                | No                                | Primary                                                    |
| Claussen et al. 2017  | Canada                                | Multiple             | Domestic violence                   | No                | No                                | None                                                       |
| Collins et al. 2006   | US - Multiple                         | Program staff        | HIV prevention                      | No                | No                                | Included                                                   |
| Collins et al. 2007   | US                                    | CBO staff            | HIV prevention                      | No                | No                                | Included                                                   |
| Collins & Sapiano    | US                                    | Program staff        | HIV prevention                      | No                | No                                | Included                                                   |
| Crowley et al. 2012   | US - IA, PA                           | Multiple             | Youth substance abuse prevention    | Yes               | No                                | Primary                                                    |
| Douglas et al. 2019   | US - OK                               | Program staff        | Chronic disease prevention          | Yes               | No                                | Primary                                                    |
| Duffy et al. 2012     | US - SC                               | Program staff        | Pregnancy prevention                | Yes               | No                                | None                                                       |
| Escoffery et al. 2012 | US - GA                               | Multiple             | Chronic disease prevention, Cancer control | Yes               | No                                | None                                                       |
| Escoffery et al. 2015 | US                                    | Program staff        | Cancer control                      | No                | No                                | Included                                                   |
| Exner-Cortens et al.  | Canada                                | Teachers and community facilitators | Domestic violence | Yes               | No                                | None                                                       |
| Fazelipour & Cunningham 2019 | Australia, Canada, New Zealand | Multiple             | Multiple                            | No                | No                                | Primary                                                    |
| Feinberg et al. 2008  | US - PA                               | Coalition members,   | Youth problem behaviors and positive youth development | No                | No                                | None                                                       |
| Fernández et al. 2014 | US - Multiple                         | Multiple             | Cancer control                      | Yes               | No                                | Included                                                   |
| Flaspohler et al. 2008 | Broadly applicable                    | Not specified        | Multiple                            | No                | No                                | None                                                       |
| Florin et al. 2012    | US - RI                               | Program staff        | Substance abuse prevention          | Yes               | No                                | None                                                       |
| Gandelman et al. 2006 | US                                    | Program staff        | HIV prevention                      | Yes               | No                                | Included                                                   |
| Citation                  | Country and US State(s) if applicable | Target Practitioners | Health focus               | Capacity measured | Measure psycho-metrics presented | Health equity focus (None / Close to None, Included, Primary) |
|--------------------------|--------------------------------------|----------------------|-----------------------------|------------------|-----------------------------------|----------------------------------------------------------------|
| Genat et al. 2016 [101]  | Australia                            | Program staff        | Nutrition                   | No               | No                                | Primary                                                        |
| Gregory et al. 2012 [102]| US - MD                               | CBO staff            | Multiple                    | No               | No                                | Primary                                                        |
| Haggerty et al. 2017 [103]| US - WA                               | CBO staff            | Positive youth development  | No               | No                                | Included                                                       |
| Hannon et al. 2010 [104] | US - Multiple                         | Coalition members, Program staff | Cancer control | Yes | No                                | Included                                                       |
| Harshbarger et al. 2006  | US                                   | CBO staff            | HIV prevention              | No               | No                                | Primary                                                        |
| Hawe et al. 1997 [105]   | Broadly applicable                    | Program staff        | Not specified               | Yes              | No                                | None                                                           |
| Haynes et al. 2014 [106] | US - GA                              | Multiple             | Cancer control              | No               | No                                | Primary                                                        |
| Homel et al. 2015 [107]  | Australia                             | Not specified        | Crime prevention            | No               | No                                | Primary                                                        |
| Honeycutt et al. 2012 [108]| US - GA                              | Multiple             | Nutrition                   | No               | No                                | Primary                                                        |
| House et al. 2017 [38]   | US - Multiple                         | Program staff        | Pregnancy prevention        | Yes              | Yes                               | Primary                                                        |
| Hunter et al. 2009 [109] | US - Multiple                         | Program staff        | Substance abuse prevention  | Yes              | No                                | Primary                                                        |
| Katz & Wandersman 2016 [26]| Multiple countries                   | Not specified        | Not specified               | No               | No                                | None                                                           |
| Kegeles & Rebchook 2005 [110]| US - Multiple                      | Multiple             | HIV prevention              | No               | No                                | Primary                                                        |
| Kegeles et al. 2015 [111]| US - Multiple                         | CBO staff            | HIV prevention              | No               | No                                | Primary                                                        |
| Kelly et al. 2000 [112]  | US - Multiple                         | CBO staff            | HIV prevention              | No               | No                                | Included                                                       |
| Kietzman et al. 2019 [113]| US - CA                              | CBO staff            | Multiple                    | No               | No                                | Primary                                                        |
| Leeman et al. 2015 [25]  | Multiple countries                   | CBO staff            | Not specified               | Yes              | No                                | None                                                           |
| Leeman et al. 2017 [114] | Multiple countries                   | CBO staff            | Not specified               | No               | No                                | None                                                           |
| Leyva et al. 2017 [115]  | US - MA                              | FBO staff, CBO staff | Cancer control              | Yes              | No                                | Primary                                                        |
| MacGregor et al. 2013 [116]| Canada                             | Multiple             | Youth violence prevention   | Yes              | No                                | Included                                                       |
| MacLean et al. 2003 [117]| Canada                              | Multiple             | Cardiovascular disease      | Yes              | No                                | None                                                           |
| Mainor et al. 2018 [118] | US - NC, OR                          | Program staff        | General health promotion    | No               | No                                | None                                                           |
| Martinez et al. 2014 [119]| US - PR                             | CBO staff            | Multiple                    | Yes              | No                                | Primary                                                        |
| Matheson et al. 2020 [120]| New Zealand                        | Not specified        | Multiple                    | Yes              | No                                | Primary                                                        |
| Miller et al. 2012 [121] | US - MI                              | CBO staff            | Strengthening families for youth with incarcerated parents | No               | No                                | Primary                                                        |
| Citation                  | Country and US State(s) if applicable | Target Practitioners | Health focus                                      | Capacity measured | Measure psycho-metrics presented | Health equity focus (None / Close to None, Included, Primary) |
|---------------------------|---------------------------------------|----------------------|---------------------------------------------------|-------------------|-----------------------------------|-------------------------------------------------------------|
| Mitchell et al. 2002 [122]| US - Multiple                         | CBO staff            | General health promotion                         | No                | No                                | None                                                        |
| Mueller et al. 2017 [123] | US - Multiple                         | CBO staff            | Pregnancy prevention                             | No                | No                                | None                                                        |
| Naples et al. 2013 [124] | US                                     | CBO staff            | General health promotion                         | No                | No                                | Primary                                                     |
| Nargiso et al. 2013 [39]  | US - RI                                | Coalition members    | Substance abuse prevention                       | Yes               | Yes                               | None                                                        |
| Nu'Man et al. 2007 [125]  | US                                     | Program staff        | HIV prevention                                   | Yes               | No                                | Included                                                    |
| Owczarak 2012 [126]       | US - WI                               | CBO staff            | HIV prevention                                   | No                | No                                | Included                                                    |
| Palinkas et al. 2020 [40] | US                                     | Program staff        | Mental health, substance abuse prevention        | Yes               | Yes                               | None                                                        |
| Peterson et al. 2015 [127]| US - WI                               | Multiple             | Preventing falls among older adults              | No                | No                                | None                                                        |
| Pettman et al. 2013 [41]  | Australia                              | Multiple             | General health promotion                         | Yes               | Yes                               | None                                                        |
| Porteny et al. 2020 [126] | US - MA, NY, FL, PR                   | Program staff        | Mental and physical disability prevention        | Yes               | Yes                               | Primary                                                     |
| Ramanadhan et al. 2012 [129]| US - MA                              | CBO staff            | Cancer control                                   | No                | No                                | Primary                                                     |
| Ramanadhan et al. 2017 [130]| US - MA                              | CBO staff            | Cancer control                                   | Yes               | No                                | Primary                                                     |
| Ramanadhan et al. 2021 [24]| US - MA                              | Program staff        | General health promotion                         | No                | No                                | Primary                                                     |
| Roeseler et al. 2011 [131]| US - CA                               | Multiple             | Tobacco control                                  | No                | No                                | Included                                                    |
| Sauaia et al. 2016 [132]  | US - CO                               | Program staff        | General health promotion                         | Yes               | No                                | None                                                        |
| Schoenberg et al. 2021 [133]| US - KY                              | Program staff        | General health promotion                         | No                | No                                | Primary                                                     |
| Serrano et al. 2020 [134] | Worldwide                             | Program staff        | Not specified                                    | Yes               | Yes                               | None                                                        |
| Sherman & Steiner 2018 [135]| US - MI                              | CBO staff            | Dementia                                         | No                | No                                | None                                                        |
| Veniegas et al. 2009 [136]| US - CA                               | CBO staff            | HIV prevention                                   | Yes               | No                                | Included                                                    |
| Villanuel et al. 2010 [137]| US - AZ, CO, MI                       | CBO staff            | HIV prevention                                   | No                | No                                | Primary                                                     |
| Whitaker et al. 2021 [136]| US - GA                               | Program staff        | Mental health                                    | No                | No                                | Primary                                                     |
| Wilcox et al. 2013 [139]  | US                                     | Multiple             | Healthy aging                                    | No                | No                                | None                                                        |
| Williams et al. 2019 [140]| US - Multiple                         | Program staff        | Chronic disease prevention                       | No                | No                                | Primary                                                     |
| Wingfield et al. 2012 [141]| US - GA, NC, SC                       | FBO staff, CBO staff | Cancer control                                   | No                | No                                | Primary                                                     |
| Yost et al. 2016 [142]    | Canada                                | Multiple             | General health promotion                         | Yes               | No                                | None                                                        |

CBO = community-based organization; FBO = faith-based organization.
respondents’ comfort with engaging in program activities related to asset development. The second efficacy scale focused on comfort implementing the 10-step Getting to Outcomes process. Internal consistency reliability was reported for both scales.

8. House and colleagues [38] drew on the Getting to Outcomes framework and assessed change in capacity for program partners to use EBIs. Relevant items focused on knowledge and confidence in using the Getting to Outcomes process for EBI implementation. Scale reliability data were presented.

9. Nargiso and colleagues [39] examined general capacity of a prevention-focused coalition grounded in the Systems Prevention Framework. Coalitions rated themselves on a 5-point scale for ten items across five domains of capacity: mobilization, structure, task leadership, cohesion, and planning/implementation. They also had an overall coalition capacity score which was a standardized average across the scores. Experts also rated the coalitions regarding leadership, turnover, meetings, visibility, and technological capacity. Inter-rater reliability between participants and experts was calculated.

10. Palinkas and colleagues [40] created a measurement for program sustainment that includes a section on “infrastructure and capacity to support sustainment.” Seven items address relevant concepts and data for inter-item reliability, convergent validity, and discriminant validity were presented.

11. Pettman and colleagues [41] measured capacity in terms of implementation behaviors, knowledge, confidence, and attitudes. Although they did not provide psychometric data in the report, they reported using adapted versions of previously validated items.

**Table 2.** Concepts that appeared in five or more articles, among the 78 studies that offered explicit or indirect definitions of capacity, ordered by decreasing frequency

| Concept                                      | Number of articles | Percent |
|----------------------------------------------|--------------------|---------|
| Skills (e.g., for actions needed to use EBIs) | 51                 | 65%     |
| Knowledge/expertise (e.g., information about the program) | 42                 | 54%     |
| Resources (e.g., constraints or supports on action) | 25                 | 32%     |
| Attitudes (e.g., stance on using EBIs) | 14                 | 18%     |
| Motivation (e.g., drive to seek EBIs) | 12                 | 15%     |
| Self-efficacy/confidence (e.g., a sense that the implementer can take the needed action) | 11                 | 14%     |
| Implementation behaviors (e.g., conducting a step in the EBI) | 11                 | 14%     |
| Ability (e.g., being capable of implementation) | 11                 | 14%     |
| Infrastructure (e.g., formal systems in the organization) | 7                  | 9%      |
| Sufficient workforce (e.g., the number and type of needed staff) | 7                  | 9%      |
| Leadership (e.g., ability to generate enthusiasm for the EBI) | 7                  | 9%      |
| Social networks (e.g., connections among implementers) | 7                  | 9%      |
| Organization culture/support (e.g., perceived interest in EBIs at the organization level) | 6                  | 8%      |
| Technical/technology (e.g., necessary hardware and software) | 5                  | 6%      |
| Readiness (e.g., willingness to address the issue at hand) | 5                  | 6%      |

EBI = evidence-based intervention.

**Table 3.** Populations of focus as described in reviewed studies, with some studies addressing the needs of multiple populations (n = 99 articles)

| Population                                      | Number |
|-------------------------------------------------|--------|
| Hispanic/Latino                                  | 18     |
| African American                                 | 16     |
| Underserved (no specifics provided)               | 21     |
| Low-income                                       | 15     |
| Lesbian, gay, bisexual, transgender, queer (LGBTQ+) | 10     |
| Racial/ethnic minorities (no specifics provided) | 9      |
| Native American                                  | 5      |
| Unhoused                                         | 3      |
| Rural                                            | 4      |
| Asian or Pacific Islander                        | 1      |
| Incarcerated                                     | 1      |
| Aboriginal                                       | 1      |
| People with disabilities                         | 2      |

Of the 99 studies, 40 focused exclusively on populations experiencing inequities (40%), 22 included those populations (22%), and 37 did not focus on populations experiencing inequities (37%). As shown in Table 3, the most commonly studied populations included Hispanics/Latinos, African Americans, populations described in the article as “underserved” or low-income, and LGBTQ + populations. We note that the reference to underserved populations did not always include a description of how that was operationalized. Several other priority populations were only represented by one or a small number of studies, for example, people living in rural areas or with disabilities.

**Question 3: To What Extent were Studies Focused on Health Equity?**

This scoping review used a comprehensive search strategy to examine how the capacity for EBI use in CBOs is defined and measured. Broadly, our work highlights the need for those addressing capacity-building for EBI use in CBOs to 1) be explicit about models and definitions of capacity-building as implementation strategies, 2) specify expected impacts and outcomes across multiple levels, 3) develop and use validated measures for quantitative work, and 4) integrate equity considerations into the conceptualization and measurement of capacity-building efforts.

**Discussion**

This scoping review used a comprehensive search strategy to examine how the capacity for EBI use in CBOs is defined and measured. Broadly, our work highlights the need for those addressing capacity-building for EBI use in CBOs to 1) be explicit about models and definitions of capacity-building as implementation strategies, 2) specify expected impacts and outcomes across multiple levels, 3) develop and use validated measures for quantitative work, and 4) integrate equity considerations into the conceptualization and measurement of capacity-building efforts.
First, our results emphasize the need for researchers to be more explicit about their definitions of capacity as a target and capacity-building as a means to support implementation. We found that fewer than half of the articles reviewed offered an explicit definition of capacity. Core concepts covered in definitions centered on practitioner-level attributes, including skills, knowledge, and self-efficacy, though these were not always defined either. At the same time, discussions of practitioner capacity also included organization- and system-level attributes. The variation illustrates the lack of consensus in the field regarding the core dimensions of practitioner capacity [10,42]. Understanding capacity-building efforts as implementation strategies may help prompt reporting that includes details about the involved actors, actions, targets of action, temporality/ordering, dose, expected outcomes, and justification for selection [43].

In terms of expected impact, the overall takeaway was that capacity-building is a long-term, dynamic, system-oriented process that transforms resources into short- and long-term change at multiple levels. Expected impacts ranged from community member/client and practitioner outcomes to organization- and system-level change, echoing other recent reviews of capacity-building [19]. In the context of an outcomes model, such as the Proctor model [44], we might think of short-term impacts of capacity-building as driving implementation outcomes and longer-term outcomes that include a system’s increased ability to utilize research evidence and address new challenges [45]. Viewing capacity-building in the context of professional development prompts the addition of evaluation not only of practitioner skills, knowledge, etc., but also attitudes towards EBIs, job satisfaction and tenure, and other essential supports for EBI delivery in community settings [46]. As summarized in Fig. 4, the review offers a number of extensions to both the dimensions of capacity that warrant further attention as well as to the organization- and system-level outcomes that may result.

The results also highlight a need to improve the use and reporting of validated measures for quantitative assessments. While most quantitative studies measured capacity (48 of 57), only 11 (or 23%) offered psychometric data for these measures. This relates to a broader gap in implementation science highlighted by Lewis and Dorsey, that too few measures have psychometric data, most measures are not applied in different contexts or for different populations, and there are no minimal reporting standards for measures [47]. By increasing the testing of capacity measures for reliability and predictive validity, researchers can address gaps identified through this and previous reviews [20,48]. Other useful potential additions to the literature include identifying “gold standard” measures, determining how and when to measure capacity, gathering data from multiple levels and dynamic systems, and capturing change over time [49]. There is a particular opportunity for implementation scientists to ensure that reporting offers a detailed description of context related to the multiple levels involved in capacity-building, going beyond the required elements to expand on information central to advancing health equity [50–52].

Last, we saw that several studies addressed health inequities, with 62 of the 99 studies focusing or including populations experiencing health inequities. Our work and the broader literature emphasize supporting CBOs in EBI delivery to address health inequities [24,53,54]. At the same time, almost all of the studies that specified a location were grounded in high-income countries. Given that capacity-building is intended to be quite context-specific, this suggests an important gap in the peer-reviewed literature. Stakeholders and researchers in low- and middle-income countries have highlighted gaps in the availability, depth and breadth, support, and local customization based on in-country expertise of capacity-building interventions for EBI use [55,56]. As these gaps are addressed, it may be useful to draw on recent advances in implementation science frameworks that provide guidance on how to operationalize the incorporation of equity goals into implementation planning [57–60].

As with any study, we must ground our findings in the context of a set of limitations. First, we coded data from peer-reviewed articles, many of which had strict word limits. Thus, an activity may have taken place (e.g., validation of a measure) separately from article content. Second, the review focused exclusively on peer-reviewed literature. We are aware of many capacity-building initiatives undertaken by national and international organizations that would not have been included based on our search parameters. Third, we did not examine the details of qualitative assessments of capacity in this analysis but will do so in future work. Finally, although we attempted to build a comprehensive search strategy, we may not have found all of the relevant articles in the field. We tried to reduce this risk by relying on the expertise of a professional librarian. At the same time, several strengths outweigh these weaknesses. First, to our knowledge, this is the first comprehensive review of capacity-building measures for...
CBOs. Given the importance of CBOs for EBI delivery in support of health equity, this is a significant contribution. Second, we used duplicated screening and coding processes throughout to maintain rigor. Finally, the experience of the team with implementation science, health equity, and CBOs allowed for thoughtful consideration of the research questions and also the interpretation of results.

As measures for capacity among CBOs are strengthened, it will be critical to ensure that the definitions and models resonate with implementers and supporting systems. This may prompt the addition or broadening of some conceptualizations. As noted by Trickett, capacity-building has typically focused on building support for a given research-based resource, but if the goal is sustained use of research evidence, evaluations should also question how this work builds towards other goals in practice and community settings [61]. Through clear specification of capacity-building implementation strategies, use of validated measures for multi-level outcomes, and an intentional equity frame, we can develop high-impact supports for CBO practitioners, a set of critical institutions for addressing health inequities.

**Supplementary material.** To view supplementary material for this article, please visit https://doi.org/10.1017/cts.2022.426

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