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State-of-the-science on prevention of elder abuse and lessons learned from child abuse and domestic violence prevention: Toward a conceptual framework for research

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Abstract

The goal of this review is to discuss the state-of-the-science in elder abuse prevention. Findings from evidence-based programs to reduce elder abuse are discussed, drawing from findings and insights from evidence-based programs for child maltreatment and domestic/ intimate partner violence. A conceptual measurement model for the study of elder abuse is presented, and linked to possible measures of risk factors and outcomes. Advances in neuroscience in child maltreatment and novel measurement strategies for outcome assessment are presented.

Keywords

Conceptual framework; elder abuse; intervention; measurement; prevention; research

The science of elder abuse prevention is in its infancy. The evidence-base is poor, and findings are either anecdotal or based on poorly designed and executed studies (Dong, 2015; Lachs & Pillemer, 2015; Pillemer, Burnes, Riffin, & Lachs, 2016; Pillemer, Connolly, Breckman, Spreng, & Lachs, 2015; Ploeg, Fear, Hutchison, MacMillan, & Bolan, 2009). In part, the lack of evidence is a result of significant challenges in designing and executing rigorous studies of the phenomenon. In October 2015 a workshop, Multiple Approaches to Understanding and Preventing Elder Abuse and Mistreatment, was convened by the National Institutes of Health to gather expert opinions regarding multiple facets of the science of elder abuse. The third panel of this workshop addressed prevention. The aims of this article are to: (a) present the scant evidence extant in elder abuse prevention; (b) present the evidence from domestic violence and child abuse that may inform the development of interventions to prevent elder abuse; (c) discuss the challenges to the study of prevention programs from the perspective of measurement and design issues; (d) provide a conceptual framework for intervention research in elder abuse, linking causally prior socio-cultural and environmental factors to mediating risk factors predicting outcomes; and (e) present novel measurement strategies for examining risk factors and outcomes. The overall goal of this review is to present the state-of-the-science on elder abuse prevention to inform intervention research. Because other papers in this series address definition, prevalence, and risk factors, these topics are presented only briefly as contextually necessary in the discussion of facets of elder abuse prevention.

Elder abuse research and definitions

Elder abuse research tends to be subdivided into typologies based on community or institutional living. These groupings represent conceptually distinct contexts and sub-populations of older adults that require different methodological and theoretical considerations. Because the prevalence of abuse in these settings differs, more focus is placed on different aspects of abuse in each setting. For example, several components of abuse have been identified in community settings; categories of abuse include physical, sexual, emotional (verbal), financial, as well as neglect. Financial abuse has been observed to be highly prevalent. In institutions, the most common form of abuse has been identified as resident-to-resident, estimated to occur in 20% of residents (Lachs et al., 2016). Although not as common, another form of abuse in institutional settings is staff-to-resident abuse (Pillemer & Moore, 1989). Finally, the phenomenon of resident-to-staff aggression has been studied recently (Lachs et al., 2013). In that study it was found that the prevalence of staff-reported physical and verbal aggression by residents directed toward staff was high, with 15.6% of residents reported to direct aggressive behavior toward staff, 8% of which was physical.

Definitional Issues: Although defining abuse was the topic of a separate panel, provided here are some definitions of elder abuse in community and institutional settings to inform the discussion of elder abuse prevention research, the focus of this paper. Elder abuse may involve both formal and informal caregivers as well as resident-to-resident mistreatment. An issue in determining abuse in both the community and institutional setting is cognitive capacity and intent. People who are cognitively intact or mildly impaired have decision-making capacity (Marson, Chatterjee, Ingram, & Harrell, 1996) and many with moderate

impairment are able to make decisions such as to appoint a health care proxy (Mezey, Teresi, Ramsey, Mitty, & Bobrowitz, 2000), consent to an extended interview, and report and engage in abuse (Lachs et al., 2016). For example, in the study by Lachs et al., about half of those engaged in resident-to-resident mistreatment had no or mild cognitive impairment and another fifth were only moderately cognitively impaired.

Community Settings: Definitions of elder abuse, domestic violence, and child maltreatment have been proffered by numerous sources, including the National Research Council, the World Health Organization and the Centers for Disease Prevention and Control (CDC). There are no standard, accepted definitions of these terms; as acknowledged, abuse is poorly defined and the definition varies across agencies (CDC, 2013). Because the focus of this article is on elder abuse more definitional detail is presented. Other articles in this series focus on definitional issues in other areas of abuse. The CDC (2013) provides the following definitions. Physical abuse occurs as a result of hitting, kicking, pushing, slapping, burning, or other show of force; this may result in injury. Sexual abuse implies forcing a sexual act when the elder does not or cannot consent. Emotional or verbal abuse includes verbal and other threats to a person's self-worth or emotional well-being, such as name calling, embarrassing, destroying property, or preventing an older person from visiting with friends and family. Financial abuse is illegally misusing an elder's money, property, or assets. Additionally, neglect is a form of abuse resulting from failure to meet basic needs such as food, housing, clothing, and medical care.

Despite a history of inconsistent definition in the field of elder abuse, general consensus is now emerging on an accepted definition. Broadly, elder abuse is defined as actions or omissions of care occurring in a relationship of trust, which cause harm or serious risk of harm (whether or not harm is intended) to a vulnerable older adult or that deprive an older adult of basic needs (National Research Council, 2003).

Institutional Settings: In terms of resident-to-resident mistreatment (R-REM), the following definition is based on that of Pillemer (IOM, 2014a; McDonald et al., 2015; Pillemer et al., 2011). R-REM is defined as: Negative and aggressive physical, sexual, or verbal interactions between long-term care residents that would likely be construed as unwelcome in a community setting and have high potential to cause physical and/or psychological distress in the recipient. It is important that several components are considered in this definition. As discussed in Pillemer et al. (2011), the act cannot just be a behavior (e.g., calling out). There must be a target, and the act must be directed at one or more individuals in close proximity. The act may not always be acknowledged by the target recipient (e.g., screaming or verbal insults directed toward a person who does not respond). The act may cause psychological and/or physical harm to residents, resulting in quality of life decrements. R-REM may have a negative impact on occupational outcomes among staff because staff intervening in violent interactions between residents may get injured themselves. It can also be damaging to long-term care facilities, which may incur state and federal sanctions or become liable in civil lawsuits for failing to protect residents who are victims of R-REM. An issue in relation to resident-to-resident mistreatment is the appellation. For example, in other contexts, such as cohabitating adults in community settings, it has been suggested that violence committed by

a non-cognitively impaired person towards another non-cognitively impaired person be classified as domestic violence (Acierno et al., 2010).

State-of-the-science related to abuse prevention: Application to elder abuse and mistreatment

As reviewed in several recent articles, the evidence in support of elder abuse prevention is woefully lacking (Dong, 2015; Pillemer et al., 2016; Ploeg et al., 2009). Because there is more prevention research in the fields of domestic and intimate partner violence and child maltreatment, selected findings from this body of literature may help to inform prevention programs in elder abuse and mistreatment. The following review of domestic and intimate partner violence and child maltreatment interventions is not exhaustive because it targets primarily programs that may inform elder abuse prevention research.

Domestic/ intimate partner violence (IPV): Lessons learned

Intervention strategies from domestic and intimate partner violence (IPV) reviewed by Wolfe and Jaffe (1999) may have relevance for elder abuse. These include: legal programs (arrest, protection order, court intervention, prosecution, batterer intervention program); medical interventions; services (housing, e.g., shelters); training (violence prevention, assertiveness); resistance training and skill enhancement and practice (Rowe, Jouriles, & McDonald, 2015); and multicomponent models. Some of these interventions, those most relevant to elder abuse prevention are discussed below.

Violence prevention across the life span: Jaffe and Wolfe (2003) and Wolfe and Jaffe (1999) recommended considering violence prevention by life stage, e.g., home visitations for infants (0 to 5); school-based awareness and skill development for school-aged (6-12) and adolescents (13-18); and public education (media, promoting awareness of domestic violence and providing information about local resources), service provision, and intensive legal (police, court, and community) services for adults. As reviewed in Jaffe and Wolfe (2003), primary prevention programs delivered in high schools may include activities to increase knowledge about relationship violence. Programmatic features may include plays, videos, or didactic presentations with content aimed at attitude and behavior change, or peer support groups. Some school-based programs have resulted in youth-initiated prevention activities such as theatrical presentations to younger children or public awareness campaigns and marches and other social protests against violence (Jaffe & Wolfe, 2003). Such programs have been evaluated in terms of process outcomes such as attitudes and knowledge (Pacifi, Stoolmiller, & Nelson, 2001). Such educational and public awareness programs as well as peer support may be useful in elder abuse prevention.

The Domestic Violence Prevention Enhancement and Leadership (Delta) program targeting IPV was developed by the CDC (2002). Other programs are coordinated community representativeness aimed at reduction of risk factors in order to reduce occurrences of IPV. Successful treatments target those at risk for abuse such as new parents and young children, particularly low income groups, with a focus on parenting risk factors such as alcohol, substance abuse, domestic violence, and mental illness (e.g., Benedetti, 2012). In elder

abuse, targeting might focus on cognitive impairment and mental illness. For example, caregivers to cognitively impaired individuals might be targeted for caregiver support interventions focused on educating caregivers about the stressors and challenges of caring for a person with cognitive impairment, and how such conditions can potentiate a propensity to mistreat. An intervention focus could be on protective steps to help mitigate these risks.

As reviewed above, educational and training programs in the community have been successful. Other programs with merit and applicability to elder abuse prevention include behavioral interventions, such as cognitive behavioral therapies to treat the parent-child or caregiver-elder dyad. In the area of child maltreatment, home visits (e.g., nurse-family partnership visits during pregnancy and early childhood) have a stronger evidence base. Thus, in the area of elder abuse, social worker elder mistreatment specialists embedded within primary physician practices could spend time with older adult or high-risk perpetrator patients to conduct screening, provide education, or potentially make connections with other services.

Another potentially effective intervention is embedding specialists within physician practices. Technologies, including iPhone applications for monitoring quality of home visits, and screening interventions that are theory-driven and target a limited number of causal factors, have been found to be more successful. Thus, the use of home visitors, embedded abuse specialists, and technological applications may hold promise in elder abuse prevention.

Child maltreatment

Parents who are at greater risk of perpetrating child maltreatment (CM) are more emotionally and physiologically reactive, and are more likely to have mental health problems and developmental histories of harsh caregiving (Barth, 2009). Mental health issues of depression, anxiety, and substance abuse have all been associated with higher risk for CM perpetration, perhaps because these difficulties leave parents less able to be positively engaged with their children, and quicker to irritability, anger, and withdrawal under stress (Kolko, 2002). CM parents may display more negative affect, greater physiological reactivity, and tend to emotionally distance or cutoff from others under stress (Casanova, Domanic, McCanne, & Milner, 1992; Skowron, Kozlowski, & Pincus, 2010).

Caregiver perceptions and abuse: Caregiver perceptions and attributions characterized as “threat-sensitive parenting” may result in heightened risk for CM (Bugental, 2009). For example, CM parents are more likely to see themselves as victims of their children. Challenges experienced in the caregiving context are perceived as threats from the child, and may lead CM caregivers to take self-protective, harsh stances toward their children (Bugental, 2009) resulting in coercive and authoritative parenting (e.g., Baumrind, Larzelere, & Owens, 2010; Granic & Patterson, 2006). Thus threat-sensitive caregivers with “low control” attributions are more likely to rely on patterns of harsh and coercive caregiving. A parallel exists in the area of staff (home health care or certified nursing assistant) elder abuse prevention. Caregiver training often includes methods for diffusing threatening situations through understanding of the underlying motivation for behaviors that staff find distressing. These include for example, explanations related to the disease process and stages of

dementia that may produce different behavioral manifestations. Training in best responses to specific behaviors has been effective in reducing negative interactions (Hagen & Sayers, 1995; Maxfield, Lewis, & Cannon; 1996; Montes & Ferrano 1989; Pillemer & Hudson, 1993). One such evidence-based program offers training in treatment and prevention of resident-to-resident mistreatment: the Support, Evaluate, Act, Report, Care plan and Help to avoid (SEARCH) approach (Teresi et al., 2013). This program provides specific steps for response and amelioration of R-REM incidents. This three module training focuses on etiology, prevalence and possible treatment options, and is offered as a continuing nursing education (CNE) online learning activity (Ellis et al., 2014).

Prevention of child maltreatment: There exist a number of cost-effective parenting programs that prevent the onset of child abuse and neglect (e.g., Aos et al., 2011; MacLeod & Nelson, 2000; Prinz, Sanders, Shapiro, Witaker, & Lutzker, 2009; Stagner & Lansing, 2009). Similar to IPV, approaches to CM prevention include: public awareness campaigns; parent and child education programs geared at increasing understanding of CM; home visitation programs that specifically target a family's risk factors; and family resource centers (Cicchetti & Toth, 2005; Stagner & Lansing, 2009). A recent review of programs focusing on child maltreatment prevention can be found in Merrick and Latzman (2014).

Research on evidence-based programs designed to prevent the onset of child maltreatment and promote nurturing parenting has identified five protective factors common across all effective CM prevention programs. These effective prevention programs all: (a) develop nurturing, supportive attachments among family members; (b) support acquisition of new knowledge of parent and child development; (c) enhance parent emotional competence; (d) strengthen social connections for parents; and (e) build tangible/concrete supports for parents and families (Stagner & Lansing, 2009). Moreover, CM prevention programs often utilize a home visitation model because high-risk families possess limited resources and are often hard to reach and difficult to engage. However, research indicates that less than half of the home visitation programs studied to date show a discernible benefit to the participants, with the most effective programs offering 12 or more visits and at least a 6-month program duration (Olds & Kitzman, 1993; Stagner & Lansing, 2009).

These findings suggest that prevention programs for elder abuse should target individuals at risk perhaps through cognitive or financial capacity screening programs for example, and offer both general and specific skills training in caregiving as well as supportive interventions. Home visitation may also be a promising intervention; however, a lesson learned from the child maltreatment literature is that interventions with home visitation components should be designed to provide a sufficient "dose" in terms of number of sessions and duration to be effective in preventing abuse. Public awareness and education is also an important method for abuse prevention.

Elder abuse and prevention in community settings

As reviewed by Wolfe (2003), elder abuse intervention programs target three areas: education and prevention; integrated and coordinated (legal, medical, and psychological) community services, modeled after domestic violence programs; and legislative, including statutory adult protective service programs, modeled after child abuse initiatives.

Intervention falls into two broad categories, including primary prevention efforts designed to forestall initial onset of mistreatment and secondary prevention interventions aimed at reducing the risk of revictimization among substantiated cases.

As summarized in the Institute of Medicine (IOM) and National Research Council (NRC) report on elder abuse and its prevention (IOM, 2014a), interventions should be focused on the dyad (initiator and victim), and be targeted to different **types** of abuse and neglect, e.g., physical, financial; **settings** (community, institution); **characteristics** of the initiator and victim, e.g., cognitive and mental state; **relationships** of initiator and recipient (e.g., family, neighbor, roommate, staff); **roles** (e.g., caregiver, intimate partner); and **cultures** (different ethnic groups). Additionally, interventions should be linked to services, and there is a need for involvement of the community that considers cultural competency and targets those at risk, e.g., cognitively impaired persons or those with impaired financial decision-making capacity. Finally, a multidisciplinary and multidimensional approach should be considered. Extrapolating from successful interventions in CM and IPV, several interventions may be useful in elder abuse, including risk screening, training, behavioral interventions, home visits, helplines, and technology.

Evidence for elder abuse prevention interventions

Existing prevention interventions in elder abuse are described in Table 1. Although there is little formal evidence associated with any of these programs, they are rank-ordered according to evidence recently presented to the World Health Organization (Pillemer et al., 2016). Based on this review, the evidence presented in Table 1 was categorized in levels corresponding to that of the Kirkpatrick (1998) four-level evaluation model which provides a context for evaluating intervention programs. Level 1 process outcomes refer to attitudes and satisfaction, e.g., satisfaction with multidisciplinary team (MDT) meetings and members' assessment of team effectiveness. Level 2 refers to enhanced knowledge, e.g., increased caregiver skills or public awareness of abuse. Level 3 practice or process outcomes refer to recognition, reporting, recommendations, and actions taken on behalf of cases, and Level 4 outcomes include more distal outcomes such as reduction in caregiver stress, enhanced quality-of-life, reduced risk of revictimization, and reduced physical ramifications such as injuries, ER visits and hospitalizations, and in the case of MDTs, orders of protection and evictions.

Another framework for evaluation is that from the evidence-based practice literature that helps rank levels of evidence; for example the Cochrane reviews (Cochrane, 2007) or evidence-based practice guidelines (Melnik & Fineout-Overholt, 2005). The latter method examines seven levels from highest (Level 1) that includes multiple randomized controlled trials (RCTs) with consistent findings to lowest (Level 7) reflecting only opinions of clinical experts. Level 2 (one RCT provides evidence) is the highest level associated with abuse literature, and that is rare. Most abuse research is at the lowest level or Levels 5 and 6, indicative of descriptive, observational studies or qualitative design. We chose to incorporate the Kirkpatrick model because few Cochrane reviews exist, and there would be little variation among the levels, given that nearly all elder abuse interventions are assigned to lower tiers in the framework.

In the following section, discussed briefly are elder abuse interventions categorized according to broader aims of primary or secondary prevention. As presented above, secondary prevention is aimed at reducing risks, while primary prevention efforts are designed to forestall initial onset of mistreatment. Because greater supporting evidence relates to secondary prevention, these have higher associated levels of evidence, and are presented first.

Secondary preventions

Adult Protective Services (APS): In places with mandatory reporting laws, APS programs are typically centrally administered at the state or regional/county level as the regulated authority to receive mandated referrals of suspected elder mistreatment. In general, APS is tasked with conducting formal investigation and substantiation of elder mistreatment and developing a service plan to eliminate or reduce the risk of revictimization. In some jurisdictions, the service plan and intervention phase is contracted out to external service providers. All states in the United States offer some form of APS; however, there is significant variation from state to state and even within states across regions/counties. Although there are studies of APS, there is a paucity of research on the effectiveness of APS interventions (Ernst et al., 2013; Ramsey-Klawnsnik, Quinn, & Brownell, 2016).

Decentralized community-based programs: In places without a formal APS system, elder mistreatment response efforts are typically characterized by decentralized, informal, and potentially uncoordinated community-based programs that may be housed within larger organizations serving older adults. Unlike APS programs, decentralized community-based elder mistreatment programs are typically not required to pursue a formal investigation of suspected elder mistreatment referrals but rather conduct an assessment with willing older adults that is characterized as more collaborative in nature. Similar to APS, however, community-based elder mistreatment programs seek to develop a service plan and intervene on substantiated elder mistreatment cases towards the overall goal of revictimization risk alleviation (Burnes, 2016). Research based on case review analysis provides preliminary support for community-based elder mistreatment programs in alleviating revictimization risk by empowering victims to take action to stop the cycle or remove themselves from the abusive situation (Cripps, 2001; Lithwick, Beaulieu, Gravel, & Straka, 2000; Rizzo, Burnes, & Chalfy, 2015). Cripps used a rights focused advocacy model, which enabled victims to stop abuse in 50% of the cases and take action in 34% of the situations, while Lithwick et al. suggested a harm-reduction model to guide interventions.

Evidence suggests that programs integrating a multidisciplinary approach such as incorporating social services and criminal justice systems have merit because they can reduce revictimization risks (Brownell & Wolden, 2002; Rizzo et al., 2015). For example, Rizzo et al. evaluated a social worker-lawyer intervention model using a multivariate approach, and showed that client retention, program fidelity, and exposure to MDT were related to reduced mistreatment risk at case closure. Recently, a randomized controlled trial pilot study found that an adapted problem-solving therapy and anxiety management intervention embedded within a community-based elder mistreatment program resulted in reduced symptoms of depression and elevated levels of self-efficacy (Sirey et al., 2015), the

latter of which represents a process outcome that could potentially impact revictimization. Such programs warrant further rigorous evaluation.

Multidisciplinary teams and forensic centers: Most research on forensic centers and MDTs is at lower levels of evaluation. Wiglesworth, Mosqueda, Burnight, Younglove, and Jeske (2006) performed a Level 1 evaluation showing improved attitudes toward the efficiency and effectiveness of an elder abuse forensic center. MDTs modeled after programs in domestic violence interventions appear to be successful in terms of Level 1 satisfaction and attitudes, and Level 3 recognition of abuse, referral to protective services, money management and housing services, review by the District Attorney's Office, and higher rates of prosecution and conviction (Navarro, Gassoumis, & Wilber, 2013; Rizzo et al., 2015; Teaster, Nerenberg, & Stansbury, 2003).

One study incorporating both Level 3 and 4 evaluation was of the New York City Center for Elder Abuse (NYCCEA; Breckman, Callahan, & Solomon, 2014). That evaluation of an MDT (Ramirez et al., 2012) examined Level 3 and 4 outcomes. These authors found resolution of specific issues related to abuse, including establishment of home care, removal of clients to a different residence, services secured for substance abuse, home health aide, adult day care treatment for mental health, and shelter placement. Other Level 3 outcomes include arrest, prosecution, and eviction of the abuser. The Level 4 evaluation examined differences in case and comparison group members using multivariate logistic regression and Poisson models to control for the number of presenting problems and other covariates. The results showed that those cases reviewed within the MDT paradigm when compared to non-MDT cases were 14.8 times more likely (95% CI; 2.24, 67.5) to receive recommended actions ($p = 0.001$). A caveat is that revictimization data were not collected; however, the majority of actions taken were to remove the abused person from the abusive environment or setting, and orders of protection and eviction, likely resulting in prevention of further victimization. A statistical caveat is because of skewed outcome distributions, sparse data, and resultant model assumption violations, large confidence intervals around estimates were observed. Therefore, it is recommended that these results be replicated with a larger sample. More complete reviews of MDTs can be found in Pillemer et al. (2016) and Stahl (2015).

Shelters: Lower levels of evidence are available for shelters (Heck & Gillespie, 2013; Reingold, 2006). Shelters within institutional or other congregate living settings, sometimes modeled after shelters for women and children from abused relationships, may provide temporary shelter for individuals. There is some Level 1 and 2 evidence of enhanced satisfaction and recognition of abuse. However, the potential value (or consequences and cost) of such placement may only be assessed after the final disposition.

Primary preventions

Caregiver intervention: Risk factors for caregiver mistreatment have been studied (Beach et al., 2005), and caregiver interventions identified. Two such programs are reviewed in Table 1. Caregiver interventions have been found to enhance quality of life, reduce caregiver distress and delay institutional placement (e.g., Belle et al., 2006; Luchsinger et al., 2012; Mittelman, Roth, Clay, & Haley, 2007). Such interventions remain a promising avenue for research, particularly examining their performance in different cultural and ethnic groups,

and with specific focus on elder mistreatment. The inclusion of stress biomarkers and allostatic load will help to advance the science by including more objective measures of risk factors and outcomes. Inclusion of objective measures will potentially allow for a more in depth understanding of the role of stress in abuse promotion or prevention.

Training: Training programs remain a critical intervention for child maltreatment, domestic partner violence, and elder abuse, particularly in targeting process outcomes. Strong Level 1 and 2 evidence exists for most programs, as reviewed by Alt, Nguyen, and Meurer (2011); some Level 3 evidence exists in terms of enhanced recognition and reporting (see Cooper, Selwood, & Livingston, 2009). Level 4 evidence is rare in the literature on abuse. In the area of resident-to-resident mistreatment, as reviewed by McDonald et al., 2015, there is only one evidence-based intervention extant. This is a training program for nursing staff that was found to enhance Level 2 and 3 process outcomes such as knowledge, recognition, and reporting (Teresi et al., 2013). A recent review of elder abuse in residential settings (Castle, Ferguson-Rome, & Teresi, 2015) underscores the paucity of prevention research in this area.

Helplines: Helplines have also been found to result in benefits such as Level 2 and 3 increased awareness and mitigation of abusive situations (Sethi et al., 2011; van Bavel, Janssens, Schakenraad, & Thurlings, 2010).

Other interventions (financial assistance and screening): Other interventions with less evidence of benefit include financial management (Nerenberg, 2003; Sacks et al., 2012), and screening for abuse (Cooper, Manela, Katona, & Livingston, 2008).

Methodological challenges for research

A review of the literature reveals several design deficiencies that prevent construction of a solid evidence base. As reviewed by Ploeg, Fear, Hutchison, MacMillan, and Bolan (2009) and Pillemer et al. (2016), there are few if any evidence-based programs. Studies are inadequate, with poor designs. There are few randomized controlled trials. Studies have small sample sizes and are underpowered. Compliance with interventions is poor and little or no information about randomization and blinding procedures is given. Response rates and follow-up rates are poor. Analyses are often inadequate, failing to adjust for missing data and lack of balance between groups. Measures are poor, and often no psychometric properties are provided. As reviewed by McDonald et al., (2015), there is a paucity of reliable and valid measures appropriate for elder abuse prevention research.

An important methodological challenge is that barriers to RCTs are often constructed based on the view that it is unethical to deny services. However, it can be argued that if there is little or no evidence base, and the benefits (or harm) associated with the intervention are unknown (e.g., Ploeg et al., 2009), then an RCT or quasi-experimental design may be warranted. If randomization is not possible and only comparison groups are available, then analytic methods, e.g., propensity score methods must be used to construct balanced groups (Rosenbaum & Rubin, 1983). However, this type of design then requires the measurement of as many variables as possible, because unmeasured variables are a threat to the validity of results using such methodology.

Ethical challenges to research

An important lesson learned from other (non-elder) abuse literature is that interventions can be harmful. For example, some interventions have focused on identification of a perpetrator. However, there is a parallel between elder abuse and IPV in identification of a codependent group of individuals. Disrupting that dyad or removal of a person from their living arrangement may have deleterious effects. Moreover, identifying one of the codependent persons as the “abuser” or “perpetrator” may have the effect of silencing the “victim”. There may be a need for a different type of language to describe the initiator of the abuse.

While some screening measures exist (e.g., McDonald & Collins, 2000), screening efforts may have untoward effects (Pillemer et al., 2016), over-identifying individuals. Such false positives could result in placement of older persons in institutional settings (Wolfe, 2003) or in premature dependency resulting from decreased autonomy and financial decision making. In the context of CM, removal of a child from the home could result in harm (Wolfe & Jaffe, 1999). However, new screening measures for physical findings in the emergency room (Rosen, Hargarten, Flomenbaum, & Platts-Mills, 2016) or for financial vulnerability (Lichtenberg, 2016) may show promise as interventions.

Conceptual model for research on elder abuse

Several conceptual models of elder abuse exist for framing multi-level prevention intervention. For example, Teaster (National Institute of Justice [NIJ], 2014) proposed an ecological model that includes family, relationships, community and peers, and societal and structural components. The National Academies (NAS, 2003) proposed a sociocultural model, with the following potentially causally prior components contributing to abuse: social embeddedness and individual-level factors such as social status, physical health, personality, and beliefs and attitudes. Intervening or mediating variables include relationship-level status inequality, dependency, living arrangement, and type of relationship. This model predicts outcomes such as recurrent elder mistreatment, emotional and health status, and caregiving continuity. A recent review (Castle et al., 2015) summarizes theoretical contexts in which elder abuse has been studied, each providing frameworks that include risks and protective factors with which to organize preventive interventions and programmatic efforts. These include for example, caregiver stress, risk and vulnerability, social learning, power and control, ecological theory, dependency, situational, and exchange theory. Many of these conceptual frameworks include elements shown in the model in Figure 1.

Related to interventions, Burnes (2016) proposed a conceptual model to guide research and practice in community-based secondary prevention programs (e.g., APS, decentralized programs) that work directly with cognitively intact elder abuse victims. Anchored in core values of voluntariness and older adult self-determination, this model approaches elder abuse intervention from a post-modern/constructivist lens that accepts different, individually constructed realities regarding what the problem means, the definition of a successful case outcome, and the intervention path required to achieve success. The model emphasizes practitioner-client relational skills, such as engagement and therapeutic alliance, to enhance

the likelihood of service acceptance and willingness to entertain the possibility of change towards reducing the risk of revictimization.

In IPV and CM, there is a movement away from deviance models to stress models (Wolfe, 1999; Wolfe, 2003). Although caregiver stress is not considered a key element in elder abuse, such stress models are common in the elder caregiver literature, and may offer a strong heuristic model for elder abuse. While there are many models that one may construct to describe the role of abuse in predicting outcomes of intervention research, a modification of the caregiver stress and distress model may be appropriate in this context. Such a model is recommended for prevention intervention research because it is linked to specific measures and can be tested in longitudinal latent variable models that include mediator and moderator variables in addition to the intervention.

A stress model based on a conceptualization of the relationships among risk factors, abuse, adverse health effects, and distal outcomes may be used as the theoretical framework for the study of causal pathways of elder abuse. It builds on the work of Pillemer and Finkelhor (1988), Pillemer and Hudson (1993), and Pillemer, et al. (2011) on aggression in nursing homes, and incorporates elements from the Pearlin, Mullan, Semple, and Skaff (1990) caregiving stress model, and of a theoretical path model predicting institutional placement and service use proposed by Teresi, Toner, Bennett, and Wilder (1988). This model posits mediators and possible moderators of these relationships. A prevention intervention would be a moderator variable in this model. The model posits that events such as abuse constitute stressful life experiences, leading to adverse health effects and directly and indirectly to proximal and distal outcomes such as falls, fractures, lacerations, and injuries that may require emergency room visits and hospitalization, as well as to depression, anxiety, functional decline, and decrements in quality of life. Causally prior (antecedent) variables include characteristics of the environment (living arrangement) and social structure (social support) and of the victim and the perpetrator. Potential moderator variables are resources. For example, individuals with more financial and psychological resources and those with more training and skills related to abuse as well as caregiving may have different outcomes than those with less of each. Similarly, acculturation and ethnicity may confer advantages or disadvantages that moderate relationships in the model.

As reviewed by Pillemer et al. (2016), a prominent risk factor for abuse is dementia, and rates of physical violence have been found to be higher in caregiver/ care recipient dyads when the recipient has dementia (see Dong, Chen, & Simon, 2014, for a review). Additionally, rates are higher in settings which house such individuals, for example, assisted living (Castle & Beach, 2013) and nursing homes (Castle, 2012; Lachs, et al., 2016). Dementing illness and psychiatric and neurological disorders are precipitating conditions that can lead both directly as well as indirectly to mistreatment through stress-inducing symptoms such as behavior disorders and functional dependence. Substance and alcohol abuse may also be both a cause and result of stressful events such as abusive relationships. Stress inducing symptoms and stressful events might be bidirectional, with mistreatment both resulting from factors such as substance abuse and also leading to negative behaviors. Health conditions can be exacerbated by stress, but also contribute to negative outcomes independently. These include allostatic load, for example, an index that includes blood

pressure, glucose metabolism, lipid levels, and adiposity, which can result in adverse health outcomes.

Adhering to this model, abuse interventions are posited to impact outcomes directly and indirectly through the reduction of abuse-related stress and of adverse health effects.

Recognition of abuse and judicious reporting are potential process outcomes (not shown in Figure 1) that may be important in improving efforts to protect older persons and enhancing their quality-of-life.

Measurement issues

Shown in Table 2 are salient risk factors and potential measures arrayed as covariates, moderators, and mediators that may relate to outcome variables of interest. These include measures of social structure and the environment, including social support and living arrangement. Resources include social determinants and socio- demographic variables, e.g., financial reserve; cultural factors, such as race/ethnicity and acculturation; knowledge and skills; and psychological reserve, e.g., self-esteem, and coping. Training and skills, including health literacy are also resources that may impact the experience of stress, mistreatment, and outcomes, and as such require measurement. They can also be targeted for change as a process variable in an intervention model, and thus require quantification. Precipitating conditions include diagnoses, comorbidity, and multimorbidity. Several stress-inducing symptoms such as function, cognition, and behavior can be measured by well-validated measures shown in Table 2, including those of the Patient Reported Outcomes Measurement Information System (PROMIS®) short forms and item banks (Cella et al., 2007; Reeve et al., 2007), as well as the National Institutes of Health Toolbox (Gershon et al., 2010) neuropsychological and other cognitive measures.

Outcome measurement

Secondary prevention outcomes: As it relates to secondary prevention, the central outcome of interest is the extent to which a program prevents/reduces the risk of revictimization because this is the main objective for APS and other community-based response programs (National Adult Protective Services Association Education Committee, 2013). Change in mistreatment severity (e.g., behavioral frequency/multiplicity, perceived seriousness) represents a key clinical outcome, given the reality that most clients seek to reduce, not eliminate, their risk of revictimization (Burnes, Pillemer, & Lachs, 2016). Important secondary prevention program/process outcomes (not shown in Figure 1) include substantiation accuracy/consistency (Mosqueda et al., 2015), client-clinician engagement and alliance (Burnes, 2016), client retention and extent of service utilization (Burnes, Rizzo, Gorroochurn, Pollack, & Lachs, 2014), and recidivism (Ernst & Smith, 2012). Distal Level 4 outcomes can be measured with self- and informant-reported mistreatment and abuse assessments (e.g., Ramirez et al., 2013; Teresi et al., 2014). Specific physical measures of abuse such as lacerations, malnutrition and other indicators can be documented through physical assessments, e.g., Rosen, Hargarten, Flomenbaum, and Platts-Mills (2016).

Primary prevention outcomes: Represented in the conceptual model and shown in Table 3 are process and distal outcomes that may be important in elder abuse research, classified in

terms of formal and informal caregivers as well as the older individuals who are the recipients of abuse.

Staff and other formal caregivers: These include those at the level of the health professional or staff such as changes in attitudes, knowledge, and recognition as well as reporting, care planning and case resolution.

Informal caregiver: At the level of the family and informal caregiver, process Level 3 outcomes include reduced anger, and increased caregiver skills. Outcomes specific to caregivers include for example, self-reported caregiver burden (which can be process outcomes or mediators in some analyses), measured with the Zarit caregiver burden interview (ZCBI; Zarit, Reever, & Bach-Peterson, 1980).

Informal caregivers and abuse recipients: Distal outcomes common to both caregivers and abuse recipients include, for example, reductions in (a) fatigue, anxiety, and depression symptomatology, measured with the PROMIS short forms and item banks; and (b) self-reported stress and biomarkers of physiologic stress, measured with salivary cortisol. Distal Level 4 outcomes in some studies may include reduction in health risks such as allostatic load.

As shown in Table 3, many of the constructs can be measured with PROMIS or other well-validated self-report measures. However, there is a need to move beyond self-reported assessments to biomarkers. Biomarkers of stress include hair and salivary cortisol. Biomarkers of allostatic load may be an important mediating risk factor or process outcome. Allostatic load is an index that is measured with five main components (glucose metabolism, lipid metabolism, adipose tissue deposition, cardiovascular, and hypothalamic-pituitary-adrenal axis) with several parameters (e.g., hemoglobin, high density lipoprotein, waist circumference measured at the level of the umbilicus, systolic blood pressure, and diastolic blood pressure). This allostatic load index or modifications (e.g., Seeman, Singer, Rowe, Horwitz, & McEwen, 1997) have been used to study metabolic syndrome and physiologic stress, considering stress as an intermediate outcome or mediator (Roepke et al., 2011).

Distal outcomes also include reduction in financial costs to the caregiver, and ultimately visits to emergency rooms, hospitalization, institutional placement, and mortality. Finally, societal and programmatic costs of interventions and their incremental cost effectiveness are important outcomes.

Future measurement approaches

Goal Attainment Scaling (GAS; Kiresuk & Sherman, 1968): GAS is used to measure multifarious outcomes, which means that the outcome of interest occurs in more than one form. GAS is a client-centered or “clinometric” measure of client change (or change in case status) over the course of intervention. Each case is assessed on a different, individualized set of goal items, yet a standardized summary *t*-score is generated to allow for comparison across cases. Goal items are established collaboratively between the practitioner and client to reflect the client’s objectives and construction of success. GAS has been proposed as a suitable elder abuse program intervention outcome measure because older adult clients have

individually self-determined notions of what a successful case outcome resembles (Burnes & Lachs, 2015). In this case, GAS is a measure of client change on a unique set of needs towards the overall goal of reducing risk of revictimization.

Item banking: A future goal may be to construct an item banking project similar to PROMIS or to NIH Toolbox, in which a set of items is constructed and parameters banked for use in assessment of risk factors, other covariates, and outcomes. Given the need for inclusion of patient-reported outcomes, this type of effort may be promising. Such an effort requires both qualitative and quantitative work. Items must be collected and reviewed by content experts; focus groups are used and cognitive interviews conducted. Item response theory (Lord & Novick, 1968) is used to calibrate items and to examine the measurement equivalence of the measures as well as to estimate reliability, precision, and information at varying points along the latent construct continuum. Ultimately, a computerized adaptive testing approach could lead to reduced measurement burden because items targeted to individual levels of the trait can be selected and administered, resulting in more efficient assessment. Such a project would be very ambitious; however, beginning steps could be taken in terms of examining selected existing measures. Additionally, for some domains, existing item banks or short forms could be used, e.g., PROMIS measures, as shown in Tables 2 and 3.

Future directions for prevention research

As noted earlier, clinical research has led to the development of many evidence-based programs that successfully prevent the onset of child maltreatment and neglect. Further, among families in which child maltreatment has already occurred, effective intervention programs have been developed for children exposed to CM, in terms of documented improvements in post-traumatic stress symptoms, self-regulation deficits, and behavior problems, to name a few (e.g., Chaffin et al., 2004; Deblinger, Mannarino, Cohen, & Steer, 2006; Hurlburt, Barth, Leslie, Landsverk, & McRae, 2007). These programs, shown to be effective for improving CM-exposed children's functioning share a focus on (a) strengthening positive aspects of parent-child interactions, (b) reducing parent use of directives and harsh commands, (c) training parents in the use of specific behavioral approaches to parenting, including (d) providing detailed materials that support parents' skill building, (e) home practice, (f) monitoring changes in parenting processes (i.e., assessment-driven intervention), (g) reliance on extensive use of in vivo and role play practice, and (h) delivery over a period of six months or longer (see Hurlburt et al., 2007, for a review).

While there has been success in developing programs that prevent child abuse, far less success has been achieved with parents who have already begun to abuse or neglect their children. The IOM (2014b) suggests several avenues for further research. One idea gaining traction is that the aversive parenting observed in CM parents is fueled by deficits in parent self-regulation, which trigger acts of CM. To the extent that positive parenting reflects underlying efforts of CM parents to inhibit dominant/typical responding and exert self-control (Skowron, Cipriano-Essel, Benjamin, Pincus, & Van Ryzin, 2013), it may be that CM parents deplete their self-regulatory capacities more quickly than do low-risk parents, thus leading to overreliance on harsh, controlling parenting that may be experienced as less demanding.

In fact, research on the physiological response in the context of parenting suggests that CM parents may experience the act of parenting as more (physiologically) stressful than do their lower risk peers. Specifically, it has been found that lower maternal vagal tone (i.e., lower respiratory sinus arrhythmia) in physically abusive mothers is associated with increased positive parenting in the moment, but subsequent increases in hostile control then immediately follow (Skowron et al., 2013). In contrast with abusive parents, divergent patterns of physiology—behavior associations were observed in non-abusive, neglectful mothers. Among neglectful mothers, warm, nurturing parenting led to greater vagal tone (i.e., physiological calm), whereas reliance on more harsh, aversive control parenting led to significant declines in maternal vagal tone (i.e., greater physiological arousal; Skowron et al., 2013).

These findings may have direct relevance to elder abuse. The patterns of significant coupling in physiology and behavior suggest that it may be more physiologically taxing for abusive mothers and caregivers to older persons to provide care in positive ways and more physiologically reinforcing to engage in strict hostile control of one's child or older care recipient. To the extent that reliance on harsh parenting or caregiving is reinforcing, this may explain why abusive parenting or caregiving is resistant to many interventions. It suggests that interventions aimed at increasing positive caregiving may need to target parent and caregiver regulatory capacities in the context of parent-child and caregiver-recipient interactions. As presented above, measurement of physiological stress may be useful in both child and elder mistreatment research.

These recent findings from the field of CM research suggest fruitful avenues of inquiry for the field of elder abuse prevention, and support a biobehavioral approach to understanding and intervening to prevent elder abuse and neglect. This includes the use of stress models and biomarkers as outlined above. Given the patterns of biobehavioral concordance among neglectful parents observed; it is theorized that use of "light touch" interventions comprised of caregiver education, training, and support may be sufficient for producing effective change, given the patterns of physiology seen to support positive caregiving. Conversely, for abusive parents and caregivers to older persons it may be that more intensive interventions to strengthen caregiver self-regulation and decouple links between positive caregiving and physiological arousal may be essential to the success of interventions that are effective for reducing recidivism.

Barriers to successful interventions: As future directions in elder abuse prevention are contemplated, it is worthwhile to consider three important and unique barriers to success that will likely hamper the transposition of successful models of child maltreatment to elder abuse: ageism, extreme social isolation, and the high prevalence of cognitive impairment in victims as well as abusers. Any successful intervention strategy must address these obstacles.

Ageism is pervasive in society and in the practice of medicine; news of a child abuse death is headline grabbing because "children are not supposed to die". Elder abuse deaths are often not met with the same sense of social injustice by the general public or forensic criticality by physicians, coroners, and other health care professionals. Any prevention strategy in elder

abuse will need to make the case that even subtle abusive behaviors (e.g., delays in seeking medical care, isolation of an older person) are not normative.

Social isolation is common in all forms of domestic violence but it especially complicates elder abuse prevention. Younger victims of domestic violence are more likely to have their situation detected by teachers, classmates, or co-workers. Often the world of the elder abuse victim comes to involve only the abuser-victim dyad, with no outside party to detect incipient abuse or a high risk situation. Any preventative strategy will have to target venues and professionals who infrequently encounter putative victims.

Finally, the high prevalence of cognitive impairment in victims (and sometimes abusers) adds another layer of complexity for those wishing to create prevention strategies for elder abuse. Dyads so afflicted may not be able to make use of the “better parenting” types of interventions successful in preventing child maltreatment, may be unable to access preventive services even if they exist in a community, and may not even perceive themselves to be abused or at risk.

These are but a few of the more vexing challenges that confront elder abuse researchers as they attempt to create interventions to prevent abuse.

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Figure 1.

Heuristic elder abuse/mistreatment intervention research model: stress model positing elder abuse/mistreatment as a stressor and the intervention as a moderator with potential mediators, other moderator variables, and outcomes.

Table 1Intervention strategies for elder abuse prevention by evaluation evidence level.^a

PROGRAM	DESCRIPTION	LEVEL	EVIDENCE
Multidisciplinary Teams (MDTs)	Modified from domestic violence programs (with teams comprised of legal services, child protection, shelters, service providers, educators)	3-4	Breckman, Callahan, and Solomon, 2014; Ramirez et al., 2012: Community elderly who were victims of abuse – 78% sons and daughters living with client. Level 1 evaluation of attitudes of team members was positive; Level 3 evaluation of action plans was significant; Level 4 evaluation of actions performed was positive Level 3 recommendations and actions taken on behalf of cases: referral to protective services, financial (money management, power of attorney), housing (shelter referral) Level 4 (home care established, removal of clients to a different residence, services secured in terms of substance abuse, home health aide, adult day care treatment for mental health, shelter placement) services secured – home health aide at home to relieve stress. Arrest and prosecution of abuser, eviction of abuser. Relocation of abuser. Poisson regression model with log link showed that the MDT group was more likely than the non-MDT group to receive targeted actions. Other evaluations: Navarro, Gassoumis, and Wilber, 2013; Rizzo, Burnes, and Chalfy, 2015; Teaster, Nerenberg, and Stansbury, 2003
Caregiver Interventions	(modeled after interventions for dementia and other disorders)	3-4	General – Nahmiash and Reis, 2001
1.The Resources for Enhancing Alzheimer's Caregiver Health (REACH)	The focus of this intervention is on problem solving techniques and the development of written action plans. Elements include: problem definition; goal setting; brainstorming and selection of solutions; developing and implementing action plans. Skill sets taught to the caregivers: education about the disease, caregiving, and stress; staying healthy, keeping the home safe, maintaining emotional well-being; behavior management and enhancing social support.		Wisniewski et al., 2003; Beach et al., 2005 Effective in reducing depression and burden in studies of caregivers; however, the program has not been evaluated in terms of elder abuse.
2.The New York University Caregiver Intervention (NYUCI)	Three components: 1) Individual and family counseling sessions, the content of which is determined by the needs of the caregiver and family members (e.g., learning techniques for management of troublesome patient behavior, and promoting communication among family members); 2) participation in a support group to provide emotional support and education; 3) continuous availability of counselors to help with crises and symptoms over the course of the disease.		Mittelman, Roth, Clay, and Haley, 2007; Luchsinger et al., 2012 The program has been effective in delaying institutional placement.
3.Cognitive Behavioral Therapy	This form of therapy draws on the premise that all perceptions are based on the way we think. It focuses on		Effective for working with people with mild dementia who still have the capacity to understand and respond to verbal directions

PROGRAM	DESCRIPTION	LEVEL	EVIDENCE
	changing a person's thinking and associated depression-related behavior.		and questions (Beck, 1967, 1993; McDonnell, 1980; Teri & Gallagher-Thompson, 1991)
4.Support groups			
5.Stress reduction			
6.Coping strategies			Coping– Livingston et al., 2013; Psychological – Reay and Browne, 2002;
7.Anger Management			
8.Role Playing			
9.Education/enhancing skills and problem solving			
10.Care Coordination			
Helplines/Hotlines	Trained volunteers staff helplines to provide advice, assistance and referrals	3	Immediate referral and intervention to stop abuse documented Sethi et al., 2011; van Bavel, Janssens, Schakenraad, and Thurlings, 2010
Training professionals (first responders, service providers, lawyers, postal workers, home-delivered meals, doorpersons, bank employees, staff in institutions)	Anetzberger et al. (2000) Ellis et al., 2014; Rosen, et al., 2015 (staff in institutions)	2-3	See Alt, Nguyen, and Meurer (2011) for a review of training programs. A cross training program for Adult Protective Services, including a screen for use by Alzheimer's Association staff and handbooks for caregivers increased knowledge and reporting of elder abuse in persons with dementia. Nursing home staff training resulted in increased knowledge, recognition and reporting in the intervention as contrasted with the control group in a cluster RCT (Teresi et al., 2013).
Volunteer and buddy advocates		2	
Money Management	Daily money management programs	2	Nerenberg, 2003; Sacks et al., 2012
Home Visits (modeled after child abuse programs)		2	
Adult Protective Service (APS)/ Forensic Centers (Modeled after child protective services)	Various programs aimed at examining referrals to APS, formal reporting; descriptive studies comparing various characteristics of APS clients and community-dwelling non-APS adults; examination of community awareness; partnerships with law enforcement agencies Forensic Centers with multi-disciplinary collaborative relationships among APS, law enforcement, the district attorney's office, mental and medical health responders	1	Although there are studies of APS, there is a paucity of research on the effectiveness of APS interventions (Ramsey-Klawnsnik, Quinn, & Brownell, 2016). Level one evaluation of attitudes toward the efficiency and effectiveness of the elder abuse forensic center. (Wiglesworth, Mosqueda, Burnight, Younglove, & Jeske, 2006).
Emergency Shelters (modeled after shelters for battered women)	Shelters within institutional or congregate living settings that permit	1-2	Heck and Gillespie, 2013; Reingold, 2006

PROGRAM	DESCRIPTION	LEVEL	EVIDENCE
	older people temporary shelter from abuse		Attitudinal evidence of satisfaction; enhanced screening and recognition of abuse.
Technology-based programs	Smart phone applications for tracking financial fraud; for monitoring quality of home visits; for measuring stress and behavior	None	
Screening	Screening for elder abuse in various settings (e.g., Cohen, 2011; Fulmer, Guadagno, Bintondo Dyer, & Connolly, 2004; Moyer, 2013; Yaffe, Wolfson, Lithwick, & Weiss, 2008)	None	May be deleterious
Mandatory Reporting	Reporting to local, state and federal agencies	None	
Other advocacy service organizations			

^aThe evidence levels correspond to the Kirkpatrick (Kirkpatrick, 1998) four-level evaluation model described in the text. Numbers indicate the highest levels of evidence provided in the literature.

Table 2

Risk factor and variable classification measures according to the conceptual model of elder abuse and mistreatment (asterisks indicate the level of evidence: ***strong, **moderate, and *weak).

Variable Class	Domain/Subdomain	Possible (Example) Measures
SOCIAL STRUCTURE ENVIRONMENTAL (Moderator variable in some analyses)	*** <i>Level of social support</i> *** <i>Living arrangement</i> ** <i>Gender</i> ** <i>Age</i>	Stokes Social Network Scale (Stokes, 1983) Lubben Social Network Scale (LSNS; Lubben, 1988) and short forms (LSNS-18; Lubben & Girona, 2003; LSNS-6; Lubben et al., 2006) Social Support Questionnaire Short Form (SSQSR; Sarason, Sarason, Shearin, & Pierce, 1987) Family Environment Scale (Moos & Moos, 1986). Contains 90 true-and-false items that measure 10 different dimensions (9 items each) of one's social environment (Moos, 1987). Schaie and Willis (1995) modified eight of the Moos scales by selecting five items per scale and changing the response format to a Likert scale. The Arizona Social Support Interview Schedule (ASSIS; Barrera, 1980) assesses types of informal social support caregivers receive from friends and family.
RESOURCES (May be treated as a moderator in some models)		
1. Socio-Demographic/Cultural and other Social Determinants	** <i>Income</i> (is a low risk factor) * <i>Unemployment</i> (of perpetrator) ** <i>Financial co-dependency</i> ** <i>Race/ethnicity</i> * <i>Cultural/family values</i> * <i>Acculturation</i> ** <i>Relationship to care recipient</i> (spouse, child, child in-law [is a risk factor in some countries]) (moderator in some analyses)	Acculturation (Marín, Sabogal, Marín, Otero-Sabogal, & Perez-Stable, 1987; Marín & Gamba, 1996)
2 Psychological Resources (may be targeted process outcomes in some studies)	<i>Self esteem</i> <i>Degree of co-dependence</i> (can be a risk or protective factor) <i>Personality constructs</i> <i>Coping mechanisms</i> <i>Caregiver mastery</i>	Rosenberg Self-Esteem scale (RSE; Rosenberg, 1965); State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991) The Ways of Coping-Revised questionnaire (Folkman & Lazarus, 1988) is a 67-item instrument which asks individuals to rate on a 4-point Likert scale the degree to which they use particular strategies in dealing with conflicts or stressful situations. COPE (Carver, Scheier, & Weintraub, 1989). Caregiving Mastery Scale (6 items; Lawton, Kleban, Moss, Rovine, & Glicksman, 1989)
3. Training/skills (may be targeted process outcomes in some studies)	<i>Health literacy</i>	Rapid Estimate of Adult Literacy in Medicine (REALM; Bass, Wilson, & Griffith, 2003; Davis et al., 1993) Test of Functional Health Literacy in Adults (TOFHLA; Baker, Williams, Parker, Gazmararian, & Nurss, 1999) The Newest Vital Sign (NVS; Weiss et al., 2005)
PRECIPITATING CONDITIONS AND ADVERSE HEALTH EFFECTS	*** <i>Dementing illness</i> *** <i>Psychiatric diagnoses, and mental health disorders</i> *** <i>Neurological disorders</i> <i>Other medical diagnoses</i> (comorbidity, multimorbidity)	Diagnoses Charlson Comorbidity Index (Charlson, Pompei, Ales, & MacKenzie, 1987); Elixhauser Comorbidity (Elixhauser, Steiner, Harris, & Coffey, 1998)
STRESS INDUCING SYMPTOMS (possible mediators)	*** <i>Functional dependence</i> *** <i>Cognitive impairment/memory impairment and executive dysfunction</i> *** <i>Substance abuse/alcohol dependency</i> *** <i>Delusions/hallucinations</i> *** <i>Behavioral disorder</i>	PROMIS Physical Function (Fries et al., 2014; Rose, Bjorner, Becker, Fries, & Ware, 2008) NIH Toolbox (Gershon et al., 2010) The Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005) Functional Assessment Staging (FAST; Reisberg, Ferris, de Leon, & Crook, 1982; Reisberg, 1988; Teresi, Morris, Mattis, & Reisberg, 2000) Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE; Jorm, 2004) SCID-CT (for DSM-IV- Clinical Trials Version; First, Williams, Spitzer, & Gibbon, 2007) Behave-AD (Reisberg et al., 1987) Revised Memory and Behavior Problems Checklist (Teri et al., 1992)
STRESSFUL EVENTS (possible mediators)	<i>Abuse/maltreatment</i>	Screening scale review (Cohen, 2011; Wigglesworth et al., 2010)

Variable Class	Domain/Subdomain	Possible (Example) Measures
		R-REM (Pillemer & Moore, 1989; Ramirez et al., 2013; Teresi et al., 2014)

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Table 3

Outcome domains and measures corresponding to the elder abuse/mistreatment conceptual model.

Targeted Person	Evaluation Level	Domain/Subdomain	Measure
Professional Staff/Formal Caregiver	Process Level 1	<i>Attitudes</i>	
	Process Level 2	<i>Knowledge Recognition</i>	
	Process Level 3	<i>Reporting Referral to APS/forensic centers Public guardianship Care planning Case resolution</i>	Reporting (Gassoumis, Navaro, & Wilber, 2015) Reporting (Teresi et al., 2013)
	Process Level 4	Reduced <i>formal caregiver stress</i> Increased <i>staff morale</i>	Nurse Aides General Measure (Ramírez, Teresi, & Holmes, 2006; Ramírez, Teresi, Holmes, & Fairchild, 1998)
	Distal Level 4	Reduced <i>turnover</i>	
Family/Informal Caregiver	Process Level 1	<i>Attitudes</i>	
	Process Level 2	<i>Knowledge Recognition</i>	
	Process Level 3	Reduced <i>Anger</i> Increased <i>caregiver skills</i>	PROMIS Anger (Pilkonis, et al., 2011)
	Distal Level 4	<i>Health risks</i> Reduced <i>caregiver burden/strain</i> (mediator in some analyses) Reduced <i>stress/distress biomarkers and self-report</i> Reduced <i>caregiver anxiety</i> <i>Depression</i> <i>Fatigue</i> Increased <i>quality of life</i> (affect/subjective well-being) Reduced <i>incidents/recurrence of: psychological, verbal, financial, physical</i> (accidents, injuries), <i>sexual abuse</i> Reduced <i>neglect</i> Reduced <i>costs</i> (e.g., out-of-pocket costs of care)	Allostatic load (e.g., High Sensitivity C-Reactive Protein, Hemoglobin [HbA1C], Lipids Cholesterol [TC] HDL, resting blood pressure) (Noble et al., 2010) Zarit Burden Interview/ The Burden Interview (BI; Zarit, Reever, & Bach-Peterson, 1980; Zarit & Zarit, 1982); Global Role Strain Scale (Archbold, Stewart, Greenlick, & Harvath, 1990); Caregiving Burden (Montgomery, Stull, & Borgatta, 1985) Biomarkers (salivary, hair cortisol) Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983); Caregiving Impact Measure (Poulshock & Deimling, 1984) PROMIS Anxiety and Depression (Pilkonis et al., 2011; Teresi et al., 2009; Teresi, Ocepek-Welikson, Kleinman, Ramirez, & Kim, 2016a, b) Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001) PROMIS Short Form — Fatigue (Cella et al., 2010; Garcia et al., 2007; Reeve et al., 2016) Short Form-36 Health Survey (SF-36; Ware & Sherbourne, 1992); Sickness Impact Profile (SIP; Bergner, Bobbitt, Carter, & Gilson, 1981) McGill Quality of Life Questionnaire (Cohen, Mount, Strobel, & Bui, 1995) R-REM measure (Teresi et al., 2014) Lichtenberg Financial Screening Measure (Lichtenberg, 2016) Rosen, Hargarten, Flomenbaum, & Platts-Mills, 2016
Recipient/Client	Process Level 2	<i>Knowledge</i>	
	Distal Level 4	Reduced <i>stress/distress</i> Reduced <i>anxiety</i> <i>Depression</i> Increased <i>quality of life</i> (affect and subjective well-being)	Pearlin Mastery Scale (Pearlin, Mullan, Semple, & Skaff 1990;) PROMIS Depression and Anxiety (Pilkonis et al., 2011; Teresi et al., 2009; Teresi et al., 2016a, b)

Targeted Person	Evaluation Level	Domain/Subdomain	Measure
		Reduced <i>incidents/recurrence of:</i> <i>psychological, verbal, financial, physical</i> (accident, injuries) <i>sexual abuse</i> Reduced <i>neglect</i> Urgent care/ER visits; Hospitalizations, Readmissions; Service use; Mortality	Geriatric Depression Scale (GDS; Yesavage et al., 1982) Feeling Tone Questionnaire (FTQ; Toner, Teresi, Gurland, & Tirumalasetti, 1999) Dementia Quality of Life Instrument (DQoL; Brod, Stewart, Sands, & Walton, 1999) Activity and Affect Indicators of QoI (Albert et al., 1996; Albert et al., 1999) Conflict Tactics Scale (Straus et al., 1998) R-REM (Teresi et al., 2014) Castle (2012) Financial competency (Lichtenberg, 2016) Abrasions, lacerations (Rosen, Hargarten, Flomenbaum, & Platts-Mills, 2016) Injuries of the head, neck and upper arms, jaw and zygomatic fractures; differential reports of etiology and evidence of abuse (Lachs & Pillemer, 2015) Neglect (malnutrition, dehydration, poor hygiene, decubitus ulcers; Lachs & Pillemer, 2015)
Costs and Cost Effectiveness	Distal Level 4	Cost per outcome measure, e.g. quality of life unit (Incremental cost effectiveness ratio and QUALY's)	EQ-5D (EQ-5D Resource Page. EuroQol; Group Web Site. Available at http://www.euroqol.org .) EuroQol Visual Analogue Scale (Brazier, Jones, & Kind, 1993)