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Primary Prevention of Child Physical Abuse and Neglect: Gaps and Promising Directions

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Reviews on primary prevention have identified effective strategies to prevent child maltreatment but have ignored potentially promising interventions that have not yet been evaluated as well as gaps in the development of programs. The goal of this review was to identify these gaps and recommend future directions for developing interventions from a public health perspective. To this end, a systematic review of the literature for 1980-2004 utilizing existing databases and found 188 primary prevention interventions that addressed a broad range of risk factors was conducted. However, few had been rigorously evaluated, and only a handful demonstrated impact on child maltreatment or its risk factors. From a public health perspective, interventions that target prevalent and neglected risk factors such as poverty, partner violence, teenage pregnancy, and social norms tolerating violence toward children need to be developed and evaluated. In addition, more attention should be given to low cost interventions delivered to the public, by society, or that require minimal effort from recipients.

Keywords: *child maltreatment; policy; prevention; research*

Many child maltreatment experts have recently called for greater attention to primary prevention (Becker et al., 1995; Donnelly, 1999; Lutzker, 1998; Melton, 2002; Whitaker, Lutzker, & Shelley, 2005; Wolfe, 1991). The aim of primary prevention efforts is to prevent abuse before it occurs (Modeste & Tamayose, 2004). Recent reviews have focused on identifying programs or strategies that have been effective in preventing child abuse or neglect (Cook, Repucci, & Small, 2002; Geeraert, Van den Noortgate, Grietens, & Onghena, 2004; Godenzi & De Puy, 2001; Hahn et al., 2003; MacLeod & Nelson, 2000; MacMillan, 2000; Nelson, Laurendeau, & Chamberland, 2001). To add to these efforts, the goal of this review was to identify gaps and future directions for developing and evaluating interventions from a public health perspective.

Public health focuses mainly on primary preventive interventions and develops these based on known, modifiable risk factors (Mercy, Rosenberg, Powell, Broome, & Roper, 1993). Preventive interventions targeting risk factors that are highly prevalent in a population will generate a greater impact on the problem at the population level than targeting factors that are less prevalent (Kelsey, Thompson, & Evans, 1986, p. 41). Given equal impact, interventions that are delivered by individuals to individuals (vs. delivered by society to individuals, society, or to the environment) or that require more individual involvement or effort or repeated doses tend to be more costly (Warner, 1979), and thus less attractive from a public health perspective.

This article presents results from a review of primary prevention programs for child physical abuse and neglect to identify new opportunities for tackling the problem from a public health perspective. To organize what is known about primary prevention,

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programs are presented in a variety of ways to address a number of questions. First, the characteristics of primary prevention programs for child maltreatment, including unevaluated and evaluated programs, are described. Literature reviews typically focus only on evaluated programs as often the goal is to quantitatively summarize the results via meta-analysis (e.g., Geeraert et al., 2004). However, it is also instructive to identify programs that may have been implemented but not evaluated, some of which may be widely implemented despite the lack of evaluation data, and others that may be theoretically relevant and thus ripe for evaluation.

Given the recent reviews of effective programs, we do not mention these here. Instead, we categorize identified primary prevention programs by known risk factors. Ideally, primary prevention efforts for child abuse would be based on known causes of abuse. However, because causality is difficult to establish (and to our knowledge, has not been established for any particular factor), prevention efforts are directed toward modifying risk or protective factors consistently associated with maltreatment (consistency of an association is supportive of the association being causal). Public health justifies intervening on risk or protective factors despite the lack of evidence of causality when there is an urgency to intervene given the magnitude and seriousness of the problem and there is a coherent mechanism by which that factor might be causally related. Grouping prevention programs by the risk and protective factors on which they attempt to intervene can advance our understanding of where gaps in the field may be. For example, there may be known risk or protective factors that no intervention program has targeted. In addition, if a number of prevention programs with positive impacts on maltreatment targets a particular risk factor, we would have greater confidence that the targeted risk factor may be an important mediator of behavior change. Interventions are organized by risk factor targeted using a social-ecological perspective (Bronfenbrenner, 1986). Belsky's (1980, 1993) application of the social-ecological model to child maltreatment suggests factors from four different, interacting levels contribute to child physical abuse: individual, family, community, and society. Risk factors considered for this analysis are based on existing reviews of modifiable factors consistently associated with increased risk of child physical abuse and neglect in empirical studies (e.g., Black, Heyman, & Slep, 2001; Connell-Carrick, 2003; Freisthier, Merritt, & LaScala, 2006; Milner & Dopke, 1997; Schumacher, Slep, & Heyman, 2001). Risk factors that have not been targeted and are highly prevalent in the United States are highlighted in our discussion.

Unfortunately, these existing reviews identified very few factors considered to be protective, that is, factors moderating the impact of risk (Rutter, 1985), and none was found to be protective in more than one study. In consequence, we were unable to include protective factors in this analysis.

Finally, unevaluated but theoretically attractive prevention programs from a cost-containment perspective utilizing Warner's (1979) classification schema are identified. This schema considers three main variables. First is the "publicness" of the delivery: Programs delivered by individuals (e.g., health care providers) are more expensive than those delivered by public institutions (e.g., sanitation). Second is the "publicness" of the recipient: Preventive programs delivered to groups or, better still, to the entire community (i.e., universal or environmental interventions) may be less expensive per recipient, even more so if they avoid the expenses of identifying and reaching those at high risk. However, the cost savings of the latter may be offset by the costs of delivering the intervention to a larger population. A third variable is the degree of effort required by the recipient: Interventions that require less effort (i.e., fewer doses, less initiative) are less expensive and more appealing than those requiring greater effort. In sum, programs delivered by the public or to the public or that require the least effort by individuals are considered theoretically appealing and, therefore, worthy of further attention.

METHOD

The publications reviewed here were part of a project to identify interventions (preventive and therapeutic) for any type of child maltreatment. Interventions were located through a search of Medline, PsycINFO, ERIC (1980-2004), National Criminal Justice Reference Service, National Child Abuse and Neglect Clearinghouse, Inside Conferences (1993-2003), Conference Papers Index (1973-2003), Google, and Youth Tree USA using the search terms *child* and (*abuse* or *maltreatment* or *neglect*) and (*prevention* or *program* or *treatment* or *intervention*). The search identified 7,208 abstracts from which 369 were selected for retrieval because they appeared to either describe an intervention or review the literature. Dissertations were judiciously ordered because of the expense involved in obtaining them. References cited in literature reviews published in the past 5 years were reviewed manually to identify any missing relevant publications.

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For this review on primary prevention interventions targeting physical abuse or neglect, publications were included if (a) they described an intervention that had been implemented before any abuse or maltreatment had occurred in at least 50% of the population included in the study and (b) the objective of the intervention was to prevent the occurrence of child physical abuse, neglect, or unspecified child maltreatment (although they may not have measured abuse as an outcome) or whose impact on child maltreatment was assessed (although this may not have been the objective of the intervention). Publications were excluded if the intervention targeted a risk factor for abuse (e.g., parent–child interactions, discipline) but did not mention child abuse or maltreatment as a problem, target, or outcome; focused on training of professionals or adult survivors of child maltreatment; or described a screening or diagnostic procedure.

With these selection criteria, 140 publications describing 188 programs were included for review and coded by the first author. The variables coded included type of abuse targeted, whether the program was universal or targeted those at high risk, targeted risk factors, program content and components, staff delivering the program, and, if evaluated, evaluation design and impact on risk factors or abuse observed.

Programs replicated in different sites were counted as one program (e.g., Healthy Families America; Daro & Harding, 1999) as well as various publications describing the same program (e.g., MELD; Culbertson & Schellenbach, 1992; Ellwood, 1988). Various programs in the same publication were counted separately. When information on targeted risk factors was missing, program components or outcomes measured were used to infer the risk factor targeted (e.g., if empathy was measured as an outcome then it was included as a targeted risk factor; home visits were expected to provide social support). Only interventions evaluated with a randomized controlled trial, controlled trial with no baseline differences or baseline differences controlled for in analyses, or interrupted time series were considered rigorously evaluated interventions.

TABLE 1. Characteristics of Primary Prevention of Physical Abuse or Neglect Programs

Variable	*(n) % Total*	*% Rigorously Evaluated*
Total	(188) 100	25.5
Year of publication		
1980-1984	(31) 16.5	6.5
1985-1989	(31) 16.5	35.5
1990-1994	(45) 23.9	20.0
1995-1999	(38) 20.2	26.3
2000-2004	(43) 22.9	32.6
Target		
Physical abuse and neglect	(73) 38.8	21.6
Physical abuse	(78) 41.5	23.1
Neglect only	(3) 1.6	66.7
Child maltreatment (not specified)	(34) 18.1	30.3
Target population		
Universal	(67) 35.6	17.9
High risk	(121) 64.4	28.1
Intensity		
Average number of hours (range)	(95) 50.5	78.6 (.02 - 1140)
Average number of weeks (range)	(95) 50.5	43.5 (.14 - 312)
Mode of delivery		
Home	(47) 25.0	31.9
Health center/clinic/hospital	(19) 10.1	10.5
Home & health center	(8) 4.3	50.0
Community center	(47) 25.0	19.1
Home & community center	(14) 7.4	20.0
Schools	(13) 6.9	58.3
Printed material or video	(4) 2.1	25.0
TV, radio, Internet, or newspaper	(4) 2.1	0.0
Other multiple modes	(6) 3.2	50.0
Other single setting	(18) 9.6	11.1
Evaluation		
None	(96) 51.1	
Process	(1) 0.5	
One group postmeasure	(2) 1.1	
One group pre–post	(31) 16.5	
Nonequivalent groups	(14) 7.4	
Controlled trial	(12) 6.4	
Randomized controlled trial	(32) 17.0	
Time series/regression analysis	(2) 1.1	
Effect on risk factor or child maltreatment (among rigorously evaluated programs)		
Reduction of risk factor	(23) 50.0	
No effect on risk factor	(4) 7.9	
Reduction of abuse or neglect	(8) 17.4	
No effect on abuse or neglect	(11) 23.9	

RESULTS

Table 1 describes some of the characteristics of the 188 identified and reviewed interventions. The number of publications reporting on programs to prevent child physical abuse or neglect peaked in 1990 to 1994 and has remained relatively constant since. Most of these programs reported targeting physical abuse or physical abuse and neglect. Only three programs specifically targeted neglect (Delgado & Lutzker, 1988; Ethier, Couture, Lacharité, & Gagnier, 2000; Feldman, Case, & Sparks, 1992). One third of the programs reviewed were categorized as universal programs, that is, they were delivered to the entire population regardless of risk.

Interventions ranged from 12 min to 1,140 hr with a median of 22.9 hr spread over 1 day to 312

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TABLE 2. Evaluated and Nonevaluated Interventions Developed for Modifiable Risk Factors at the Individual, Family, Neighborhood, and Societal Levels

Risk Factors	*Nonevaluated Interventions*	*Evaluated Interventions*
Individual factors	Black, Heyman, & Slep, 2001; Connell-Carrick, 2003; Milner & Dopke, 1997; Schumacher, Slep, & Heyman, 2001	
Low level of education	Pharis & Levin, 1991; Repucci, Britner, Woolard, & Dillon, 1997, pp. 102-108, 117-129; Rodriguez & Cortez, 1988; Striefel, Robinson, & Truhn, 1998; Thomas, Leicht, Hughes, Madigan, & Dowell, 2003, p. 51; Weinman, Schreiber, & Robinson, 1992	Caruso, 1989c; Olds, et al., 1997a,c; Reynolds, Temple, & Ou, 2003a,c; Stevens-Simon, Nelligan, & Kelly, 2001[b,c,e,f]
Young age		Field, Widmayer, Greenberg, & Stoller, 1982[a]; Stevens-Simon et al., 2001[b,c,e,f]
Unwanted pregnancy	Britner & Repucci, 1997; Pharis & Levin, 1991; Repucci et al., 1997, pp. 102-108; Roussey et al., 1993	Caruso, 1989c; Field et al., 1982a; Olds et al., 1997[a,c]; Stevens-Simon et al., 2001[b,c,e,f]
Poor early bondingg	Britner & Repucci, 1997; E. Gray, 1983, p. 17[h]; Meekums, 1991; Ounsted, Roberts, Gordon, & Milligan, 1982	Constantino et al., 2001; Fraser, Armstrong, Morris, & Dadds, 2000; Huxley & Warner, 1993c; Siegel, Bauman, Schaefer, Saunders, & Ingram, 1980[e]
Psychophysiological reactivity/emotional arousal	Fetsch, Schultz, & Wahler, 1999[h]; Grotberg, Feindler, White, & Stutman, 1991; Thomas et al., 2003, pp. 24-26, 40-41	Peterson, Tremblay, Ewigman, & Salana, 2003[a]; Sanders et al., 2004[a]; Whiteman, Fanshel, & Grundy, 1987[a]
Problem-solving abilities	CSR, 1996, 6h, 7h; Daro, Jones, & McCurdy, 1993; Herrerías, 1988; Kraizer, Witte, Fryer, & Miyoshi, 1993[h]; Striefel et al., 1998; Waite, 1988; Weinman et al., 1992	Bugenthal, Ellerson, Lin, Kokotovic, & O'Hara, 2002b; Duggan, McFarlane, et al., 2004e; Duggan et al., 1999; Ethier, Couture, Lacharité, & Gagnier, 2000b; Nair, Schuler, Black, Kettinger, & Harrington, 2003; Resnick, 1985b; Whiteman, et al., 1987[b]
Cognitive inflexibility		Peterson et al., 2003[a]
Low self-esteem	J. Gray, Spurway, & McClatchey., 2001; Kline, Grayson, & Mathie, 1990; Kraizer et al., 1993[h]; Pharis & Levin, 1991; Thomas et al., 2003, pp. 36-37; U.S. General Accounting Office, 1990, pp. 76-78	Marcenko & Spence, 1994, 1996[b,e]; Resnick, 1985[b]; Vines & Williams-Burgess, 1994[a]
Attributional biases	Golub, Espinosa, Damon, & Card, 1987; Thomas et al., 2003, pp. 44-45	Bugenthal et al., 2002[a]; Whiteman et al., 1987[a]
Inappropriate expectations	Atkins, 1986; Boger, Richter, & Weatherston, 1983; Britner & Repucci, 1997; D. C. Browne, 1989; Bryan, 2000[h]; Buckley, 1985; Cowen, 2001; Fetsch et al., 1999[h]; Frank & Rowe, 1981; Friday, 1989[h]; Fulton, Murphy, & Anderson, 1991; Golub et al., 1987; Hairston & Lockett, 1985; Halpern & Covey, 1983; Kline et al., 1990; Marshall, Buckner, & Powell, 1991; Sanders, Cann, & Markie-Dadds, 2003[h]; Stilwell & Manley, 1990[h]; Thomas et al., 2003, pp. 10h, 12h, 42-43, 44-45, 46-47[h], 52[h]; Weinman et al., 1992; Whipple, 1999	Caruso, 1989c; Chambliss, 2000a,e; Constantino et al., 2001; Duggan, McFarlane, et al., 2004[e]; Duggan et al., 1999; Heid, 1992a; Huxley & Warner, 1993[c]; Marshall et al., 1996[b,h]; Peterson et al., 2003a; Sanders et al., 2004[a]; Taylor & Beauchamp, 1988[a,h]; Velasquez, Christensen, & Schommer, 1984[e]
Lack of empathy	Barlow et al., 2003; Cowen, 2001; Fetsch et al., 1999[h]; Kline et al., 1990; Thomas et al., 2003, pp. 44-45	Ethier et al., 2000b; Marshall et al., 1996[a,h]; Stevens-Simon et al., 2001[c,e,f]
Social skills deficits	Britner & Repucci, 1997; D. C. Browne, 1989; Powell, 1980[h]; Richey, Lovell, & Reid, 1991	Constantino et al., 2001[a]; Heid, 1992
Substance abuse	Katzev, Pratt, Henderson, & McGuigan, 1999[h]; Striefel et al., 1998; Thomas et al., 2003, p. 56	Duggan, Fuddy, et al., 2004[b]; Duggan, McFarlane, et al., 2004[e]; Duggan et al., 1999; Luthar & Suchman, 2000[a]; Nair et al., 2003; Thomas et al., 2003, p. 24-26[a,c]
Dysphoria	Scott, 1992h; Striefel et al., 1998	Duggan, Fuddy, et al., 2004[b]; Duggan, McFarlane, et al., 2004[e]; Duggan et al., 1999; Ethier et al., 2000[b]; Fraser et al., 2000a; Luthar & Suchman, 2000[a]; Vines & Williams-Burgess, 1994[a]; Thomas et al., 2003, pp. 24-26[a,c]
Parenting skills	Armstrong, 1981; Bavolek & Dellinger-Bavolek, 1987[a], 1987[b]; Causby, Nixon, & Bright, 1991; CSR, 1996, 6[h], 8[h]; Darmstadt, 1990; Daro et al., 1993, pp. 14, 14 4, 15 3; Delgado & Lutzker, 1988; Kowal et al., 1989; Marshall et al., 1991; Repucci et al.,	Chambliss, 2000[a,e]; Constantino et al., 2001;Daro & Harding, 1999[c,e]; Duggan, McFarlane, et al., 2004[e]; Duggan et al., 1999; Feldman, Case, & Sparks, 1992[a]; Field et al., 1982[a]; Fraser et al., 2000[b]; Hornick & Clarke, 1986[a]; Marcenko &

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	1997, pp. 117-129; Rodriguez & Cortez, 1988; Sanders et al., 2003h; Smith, Poertner, & Fields, 1990; Stilwell & Manley, 1990[h]; Thomas et al., 2003, pp.36-37, 44-45; Thompson, Ruma, Brewster, Besetsney, & Burke, 1997; Waite, 1988; Wilson & St. Pierre, 1990	Spence, 1994; Marcenko, Spence, & Samost, 1996[b,e]; Nair et al., 2003; Resnick, 1985; Sanders et al., 2004[a]; Stevenson, Bailey, & Simpson, 1988[b]; Vines & Williams-Burgess, 1994[b]; Wolfe, Edwards, Manion, & Koverola, 1988[a]
Lack of knowledge of parenting techniquesg	Barlow et al., 2003; Britner & Repucci, 1997; Cerny & Inouye, 2001; Copeland, 1995h; Cowen, 2001[h]; CSR, 1996, 2[h], 4[h], 6[h], 7[h], 9[h], 10[h]; Culbertson & Schellenbach, 1992[h]; Cuomo, 1988[h]; Darmstadt, 1990; Daro et al., 1993, pp. 13, 14 2, 14 3, 14 5, 15 1, 15 2, 15 4, 15-16; Friday, 1989[h]; Golub et al., 1987; E. Gray, 1983, pp. 17-19[h]; J. Gray et al., 2001; Grayson & McNulty, 1982; Hairston & Lockett, 1985; Hammel et al., 2002[h]; Herrerías, 1988; Hiatt, 1994[h]; Honig & Morin, 2001; Huebner, 2002; Katzev et al., 1999[h]; Kline et al., 1990; Mandell, 2000[h]; Mulsow & Murry, 1996; Naughton & Heath, 2001; Onyskiw, Harrison, Spady, & McConnan, 1999; Peterman, 1981; Reis & Herzberger, 1980; Repucci et al., 1997, pp. 81-91[h], 92-101, 102-108, 109-115; Rosenstein, 1988; Showers, 1989[h], 1992[h]; Smith et al., 1990[h]; Striefel et al., 1998; Thomas et al., 2003, pp.10[h], 34-35[h], 42-43, 46-47[h], 56; Whipple, 1999	Barth, 1991[e]; Brooten et al., 1986; Bugenthal et al., 2002[b]; Caruso, 1989[c]; Eldred & Zaslow, 1998[a]; Hardy & Streett, 1989[c,f]; Henwood, 1997[a,h]; Laurendeau, Gagnon, Desjardins, Perrault, & Kishchuk, 1991[b,h]; Luthar & Suchman, 2000[a]; Marshall et al., 1996[a,h]; Olds et al., 1997[c]; Reynolds et al., 2003[c]; Taylor & Beauchamp, 1988[a,h]; Velasquez et al., 1984[e]
Harsh discipline	Britner & Repucci, 1997; Ellwood, 1988; Hairston & Lockett, 1985; Herbert, 2000; Thomas et al., 2003, pp. 42-43, 46-47[h]; Waite, 1988	Bugenthal et al., 2002[b]; Heid, 1992; Peterson et al., 2003[a]
Knowledge about abuseg	Derezotes & Barth, 1993; E. Gray, 1983, p. 19[h]; Kraizer, 1992[h]; McQuillen, O'Brien, & Schrader, 1993; Thomas et al., 2003, pp. 38-39g, p. 542; Volpe, 1984[h]	Dake, Price, & Murnan, 2003[a,h]; Dhooper & Schneider, 1995[a,h]; Hébert, Lavoie, Piché, & Piotras, 2001[a,h]; Peraino, 1990[a,h]; Wolfe, MacPherson, Blount, & Wolfe, 1986[a,h]
Child behavior	Whipple, 1999	Field et al., 1982[a]; Heid, 1992; Reynolds et al., 2003[c]; Stevenson et al., 1988b; Thomas et al., 2003, pp. 24-26[a,c]
Family factors	(Black, et al., 2001)	
Poverty	Repucci et al., 1997, pp. 102-108, 117-129	Paxson & Waldfogel, 1999[b,c]; Thomas et al., 2003, pp. 24-26[c]
Unemploymentg	Fetsch et al., 1999h; Katzev et al., 1999[h]; Pharis & Levin, 1991; Repucci et al., 1997, pp. 109-115[h]; Thyen, Thiessen, & Heinsohn-Krug, 1995[h]	Fein & Lee, 2003[a,d,e]; Field et al., 1982[a]; Olds et al., 1997[a,c]
Family conflict/ Partner violence	Barth, 1989; Cowen & Reed, 2002; CSR, 1996, 4[h], 5[h], 6[h], 8[h]; Daro et al., 1993, p.14, 3; Downing, 1982; Earls, McGuire, & Shay, 1994; Frenza, 1993; Grayson & McNulty, 1982; Hairston & Lockett, 1985; Halpern & Covey, 1983; Harrison, 1981; Loadman & Vaughn, 1990; Pardeck & Nolden, 1985; Pharis & Levin, 1991; Repucci et al., 1997, pp. 81-91[h], 102-108; Rodriguez & Cortez, 1988; Thomas et al., 2003, pp. 34-35[h], 40-41, 50-51, 56; Thyen et al., 1995; Weinman et al., 1992; Whipple, 1999;	Duggan, Fuddy, et al., 2004[b];Duggan, McFarlane, et al., 2004e; Duggan et al., 1999; Ethier et al., 2000[b]; Huxley & Warner, 1993[c]; Velasquez et al., 1984[e]
Stress		Brayden et al., 1993[d,e]; Ethier et al., 2000[a]; Fraser et al., 2000[b]; Marcenko & Spence, 1994; Marcenko et al., 1996[b,e]; Siegel et al., 1980[e]; Stevens-Simon et al., 2001[c,e,f]; Thomas et al., 2003, pp. 24-26[a,c]; Vines & Williams-Burgess, 1994[a]
Social isolation	Andrews & Linden, 1984; Barlow et al., 2003; Barth, 1989; Boger et al., 1983; Britner & Repucci, 1997; Carnahan, Nelson, & Gordon, 1999; "Child Abuse Program," 1983; CSR, 1996, 3[h], 5[h], 7[h], 8[h], 9[h], 10[h]; Culbertson & Schellenbach, 1992[h]; Darmstadt, 1990; Daro et al. 1993, pp. 13, 14 2, 14 4, 14 5, 15 2, 15 3, 15 4, 15-16, 16 2; Downing, 1982; Earls et al., 1994; Egan, 1988; Ellwood, 1988; Flynn, 1999; Frenza, 1993; Friday, 1989[h];	Barth, 1991[e]; Brooten et al., 1986[e]; Bugenthal et al., 2002; Caruso, 1989[c]; Chambliss, 2000[c]; Constantino et al., 2001; Daro & Harding, 1999[c,e]; Dawson, Van Doorninck, & Robinson, 1989[e]; Duggan et al., 1999[e]; Ethier et al., 2000[b]; Fraser et al., 2000[b]; Hardy & Streett, 1989[c,f]; Hornick & Clarke, 1986; Marcenko & Spence, 1994; Marcenko et al., 1996[b,e]; Nair et al., 2003; Olds et al., 1997[c]; Stevens-Simon et al., 2001[c,e,f]; Thomas et al., 2003, pp. 24-26[a,c]; Velasquez et al., 1984[e]

(*continued*)

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TABLE 2. (continued)

Risk Factors	*Nonevaluated Interventions*	*Evaluated Interventions*
	Garbarino, Kostelny, & Barry, 1998; E. Gray, 1983, pp. 17[h], 19[h]; J. Gray et al., 2001; Halpern & Covey, 1983; Harrison, 1981; Hiatt, 1994[h]; Honig & Morin, 2001; Katzev et al., 1999h; Kiernan, Westrum, & Leahy, 1980; Kline et al., 1990; Marshall et al., 1991; Mulsow & Murry, 1996; Onyskiw et al., 1999; Ounsted et al., 1982; Pharis & Levin, 1991; Pillai, Collins, & Morgan., 1982[h]; Peterman, 1981; Powell, 1980h; Repucci et al., 1997, pp. 81-91[h], 102-108, 117-129; Richey et al., 1991; Rosenstein, 1988; Santana, 2000; Smith et al., 1990; Stilwell & Manley, 1990h; Thomas et al., 2003, pp. 12[h], 34-35[h], 44-45, 52; U.S. General Accounting Office, 1990, pp. 76-78; Weinman et al., 1992	
Neighborhood Factors	(Freisthier, Merritt, & LaScala, 2006)	
Social disorganization	Andrews & Linden, 1984; CSR, 1996, 3[h], 4[h], 8[h]; Earls et al., 1994; Garbarino & Kostelny, cited in Garbarino et al., 1992; Lauderdale & Savage, cited in Garbarino et al., 1998; Skaff, 1988[h]	
Low social cohesion	Earls et al., 1994; Garbarino et al., 1998; Kline et al., 1990; Mann, 1986; Powell, 1980[h]	
Child care[g]	Andrews & Linden, 1984; Cowen, 1992; Daro et al., 1993, pp. 14 5, 16 2; Earls et al., 1994; Loadman & Vaughn, 1990; Pharis & Levin, 1991; Repucci et al., 1997, pp. 92-101; Striefel et al., 1998; Thomas et al., 2003, pp. 40-41, 50-51, 56	Field et al., 1982; Reynolds et al., 2003[c]
Fragmented social services	Andrews & Linden, 1984; CSR, 1996, 2[h], 3[h], 6[h], 7[h], 8[h]; Mann, 1986; Mulroy & Shay, 1997; Onyskiw et al., 1999; Skaff, 1988[h]; Striefel et al., 1998	
Access to services	Ayoub & Jacewitz, 1982; Barth, 1989; Bennie, Westphalen, Clements, & Normoyle, 1982; Britner & Repucci, 1997; Culbertson & Schellenbach, 1992; Earls et al., 1994; Flynn, 1999; Frenza, 1993; E. Gray, 1983, p. 17[h]; Grayson & McNulty, 1982; Halpern & Covey, 1983; Hiatt, 1994h; Katzev et al., 1999[h]; Kowal et al., 1989; Loadman & Vaughn, 1990; Mulsow & Murry, 1996; Pardeck & Nolden, 1985; Pharis & Levin, 1991; Pillai et al., 1982h; Repucci et al., 1997, pp. 102-108, 117-129; Rosenstein, 1988; Roussey et al., 1993; Santana, 2000; Smith, et al., 1990h; Striefel et al., 1998; Thomas et al., 2003, pp. 40-41, 52; Thyen et al., 1995[h]; U.S. General Accounting Office, 1990, pp. 76-78	Barth, 1991[c]; Brayden et al., 1993[d,e]; Brooten et al., 1986[e]; Caruso, 1989[c]; Chambliss, 2000b,[e]; Constantino et al., 2001; Daro & Harding, 1999[c,e]; Dawson et al., 1989[e]; Duggan, McFarlane, et al., 2004[a,e]; Duggan et al., 1999; Fraser et al., 2000; Hornick & Clarke, 1986; Huxley & Warner, 1993[c]; Marcenko & Spence, 1994; Marcenko et al., 1996[b,e]; Nair et al., 2003; Olds et al., 1997[c]; Reynolds et al., 2003[c]; Stevens-Simon et al., 2001[b,c,e,f]; Velasquez et al., 1984
Societal Factors	(Belsky, 1993)	
Social tolerance of abuse	Brown, Basil, & Bocarnea, 2003	Durrant, 1999[a,e,h]

NOTE: No letter in evaluated interventions means risk factor or child maltreatment not measured
a. Evidence of reduction of risk factor.
b. Evidence of no effect on risk factor.
c. Evidence of reduction in physical abuse or child maltreatment.
d. Evidence of increase in physical abuse or child maltreatment.
e. Evidence of no effect on physical abuse or child maltreatment.
f. Effect on child maltreatment reported but measure not described.
g. Risk factor not identified in reviews cited.
h. Universal interventions.

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weeks with a median of 19 weeks and were delivered in a variety of settings. One fourth of the programs were delivered in community agencies, and another one fourth utilized home visits as their mode of delivery. An additional 7% and 4% combined home visits with group interventions in community agencies or hospital visits, respectively. Hospitals were the setting in another 10% of programs, whereas less than 7% were delivered in schools.

One half of the programs identified reported some type of evaluation; however, less than one fourth ($n = 46$) met our criteria of "rigorous evaluation." Of the 46 evaluated programs, 17 measured the program's impact on child maltreatment with 9 showing reductions. However, 2 of the publications (Hardy & Streett, 1989; Stevens-Simon, Nelligan, & Kelly, 2001) did not describe how child maltreatment was assessed. An additional 20 programs measured the intervention's impact on one or more of the targeted risk factors; 18 reported reductions in the risk factor targeted.

Coverage of Risk Factors

A central aim of this article was to identify gaps in primary prevention programs. Primary prevention interventions are typically developed to modify known risk and protective factors. The literature reviews consulted for this analysis did not identify protective factors consistently associated with reduced risk. In Table 2, programs have been matched to the risk factors they targeted, discriminating whether the program had been evaluated or not. Among those evaluated, the table also identifies those showing reductions in child maltreatment and/or the risk factor targeted.

More than one third of the programs identified targeted three or more risk factors, and almost all risk factors have been targeted. Some programs (13.3%) targeted factors that were not identified as known risk factors in the literature reviews (e.g., poor early bonding, knowledge of child abuse, and lack of child care). Some factors were highly popular among programs (e.g., social isolation, parenting knowledge, access to services). On the other hand, there were very limited efforts to modify other risk factors such as teenage pregnancy, cognitive inflexibility, attributional biases, social skills deficits, harsh discipline, family conflict and partner violence, poverty, social disorganization, lack of cohesion, fragmented services, and social norms tolerating violence toward children. Teenage pregnancy, partner conflict, poverty, and social norms tolerating violence toward children are of known high prevalence in the general population.

DISCUSSION

Many authors have noted the need for primary prevention strategies for child maltreatment. Several recent reviews have already addressed the question of "what works" in child maltreatment prevention (Cook et al., 2002; Geeraert et al., 2004; Godenzi & De Puy, 2001; Hahn et al., 2003; MacLeod & Nelson, 2000; MacMillan, 2000; Nelson et al., 2001). The goal of this review was to examine broadly the approaches taken in the primary prevention of physical abuse and neglect to identify programmatic and research gaps from a public health perspective.

There were a surprisingly large number of primary prevention programs for child maltreatment. In all, there were 140 publications that described 188 primary prevention programs or strategies for child maltreatment. Although the number of programs was large, there were several notable gaps in the body of work. First, only about one fourth of those programs included a rigorous evaluation. Thus, the effectiveness of a majority of primary prevention programs for child maltreatment is still unknown. In addition, many of the evaluated programs did not measure child maltreatment but measured only the risk factor that was hypothesized to lead to child maltreatment. Although it is important to measure those mediators, it is equally important to measure final outcomes such as child maltreatment and other related health outcomes until the link between risk factors and outcomes is known with greater certainty. A second major gap is that only three programs specifically targeted neglect, the most common form of child maltreatment (U.S. Department of Health and Human Services, Administration on Children Youth, and Families [USDHHS], 2006). Even among programs that purported to address physical abuse and neglect, the elements that specifically addressed neglect were unclear. Thus, there is a need for programs/strategies that address neglect. A final gap is that there is an uneven distribution of primary prevention strategies that address modifiable risk and protective factors across the social ecological model, which is discussed in some depth below.

Neglected Risk Factors of High Prevalence

There were limited efforts to modify some risk factors, mainly, teenage pregnancy, cognitive inflexibility, attributional biases, social skills deficits, harsh discipline, family conflict and partner violence, poverty, social disorganization, lack of community cohesion, fragmented social services, and social norms that tolerate violence toward children. From a public health perspective, preventive interventions

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targeting risk factors that are highly prevalent in a population will generate a greater impact on the problem at the population level than those targeting factors that are less prevalent, even when their association with the problem is stronger. Of the risk factors that have been neglected, at least four are known to be highly prevalent.

Social norms regarding physical discipline may be the most prevalent risk factor for child abuse in the United States. Although acceptance of physical discipline has been decreasing, around 74% of parents report hitting their children (Jackson et al., 1999), and 47% reporting hitting very young children (Regalado, Sareen, Inkelas, Wissow, & Halfon, 2004) despite the growing evidence of increased risk of developmental harm (Gershoff, 2002). Because most incidents of physical abuse begin with parental intentions to discipline (Kadushin & Martin, 1981) and belief in the value of physical discipline is a strong determinant of its use (Jackson et al., 1999), changing this social norm is an opportune direction for the prevention of physical child abuse.

The media and legislation have been effective in changing social norms related to other health problems in the past (e.g., tobacco, seat belt use). Well-designed media messages can provide information on the consequences of parental violence toward children, influence perceptions on the value of children and the motives for their behavior, suggest alternative discipline strategies, and increase perceptions of social disapproval for the use of violent discipline. In addition, policies or laws prohibiting physical violence toward children have been adopted in 15 countries, and such policies help to delineate a clear boundary for parental behavior. Although a combination of legislation and mass education over a period of 50 years did not show an impact on deaths or reported assaults of children in Sweden, it was followed by a decrease in social norms accepting the use of physical punishment (Durrant, 1999) and the frequency and harshness of physical punishment (Durrant & Janson, 2005); therefore, legislation and well-designed media campaigns merit further evaluation in other contexts.

Poverty is another prevalent and neglected risk factor in primary prevention efforts. Seventeen percent of children live in poverty (Federal Interagency Forum on Child and Family Statistics, 2006). Given the prevalence and importance of poverty as a risk factor for maltreatment, especially neglect, the lack of research on the impact of existing efforts to reduce poverty on child maltreatment is surprising. The two studies that examined how welfare reform efforts may affect child maltreatment reported conflicting findings. Fein and Lee (2003) found slight increases in child neglect after instituting welfare reforms promoting employment; Paxson and Waldfogel (1999) found that increases in welfare benefit levels were associated with large decreases in child neglect and small increases in physical abuse. There is evidence that earnings supplements together with child care and affordable health insurance can improve parenting behaviors (Huston et al., 2003), suggesting that these efforts might reduce child maltreatment as well. However, these efforts must be carefully evaluated to detect inadvertent negative effects such as those shown by Fein and Lee (2003). Obviously, there is much more to know about how social policies affect risk and protective factors for child maltreatment and actual child maltreatment rates. Researchers/policy analysts should take advantage of experimental research in welfare reform and poverty reduction efforts (e.g., Eldred & Zaslow, 1998; Foley et al., 2002; Huston et al., 2003; Knox, Miller, & Gennetian, 2000) to examine how those efforts may affect on child maltreatment. Given that most children living in poverty are not maltreated, efforts to develop prevention programs among the poor would benefit greatly from research identifying protective factors in the midst of poverty.

Partner violence is another neglected and prevalent risk factor that should be targeted for primary prevention of child abuse and neglect. It is estimated that between 16% and 24% of children live in homes where there is partner violence (Osofsky, 2003). Unfortunately, existing interventions for batterers have not been very effective in preventing further spouse abuse (Babcock, Green, & Robie, 2004), and none has examined the impact of these interventions on child maltreatment. Although there are many services for abused women, for the most part their impact is unknown (Klevens & Sadowski, 2005). Only advocacy and safety planning have shown evidence of reducing reabuse (Klevens & Sadowski, 2005), and again, the effect of these services on child maltreatment has not been assessed. More work is needed to develop effective interventions for partner violence and to establish the impact of new and existing partner violence interventions on children.

Finally, young age of parents is another highly prevalent and neglected risk factor. About 10% of children are born to teenaged mothers (Martin et al., 2005). Although effective interventions to reduce the occurrence of teenage pregnancies have been identified (Kirby, 2001; Manlove, Papillio, & Ikramullah, 2004), more research is needed to establish their potential impact on child maltreatment. A

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potentially promising program in this direction is Field et al.'s (1982) intervention in that, in addition to improving parent–child interactions, it reduced teenage repeat pregnancy and improved mothers' education levels.

Theoretically Attractive Programs From a Cost-Containment Perspective

As explained earlier, programs delivered by the public or to the public or that require the least effort by recipients are considered most theoretically appealing from a cost-containment perspective and, thus, worthy of further attention. The only evaluated intervention in the first category (delivered by the public) were Sweden's legislative and educational efforts to ban corporal punishment. The need for further evaluations of interventions of this type was discussed previously given the high prevalence of social norms tolerating violence toward children. Other examples of interventions that could be developed and evaluated in this category are policies that increase the value society places on children (e.g., tax policies, public investment in child care and education, salaries of caregivers and teachers) or that protect the welfare of families with children (e.g., livable minimum wage, subsidized housing in safe communities, increasing the availability of affordable high-quality child care, paid maternity/paternity leave)and promoting scientifically based child-rearing strategies through mass media (e.g., Sanders, Montgomery, & Brechman-Toussaint, 2000).

There were four evaluated interventions in the category of interventions delivered to the public, or general population, three of which showed positive impacts on risk factors. One was a home visitation program delivered to all mothers (Taylor & Beauchamp, 1988). A second was a 1-hr didactic session delivered to high school students (Marshall et al., 1996), and a third was an informational card or video delivered to expectant parents (Henwood, 1997). Although home visitation may be too expensive to deliver to the whole population, the low cost of these last two interventions makes them especially attractive for further attention. Dias et al.'s (2005) recent trial delivering this same information to new parents in the hospital setting provides additional evidence for the potential effectiveness of Henwood's intervention.

Community-level interventions that increase social cohesion or community organization (e.g., Garbarino & Kostelny, as cited in Garbarino, Kostelny, & Barry, 1998; Lauderdale & Savage, as cited in Garbarino et al., 1998) as well as interventions enhancing availability, coordination, and integration of social services needed by families and children (e.g., Andrews & Linden, 1984; CSR, 1996) would also fall into the category of interventions delivered to the public and should be further developed and rigorously evaluated. These interventions also have the characteristic of requiring little effort from recipients.

Showing effectiveness of interventions delivered to the public or by the public may be difficult for at least two reasons. First, incidence rates for child maltreatment based on official child protective service reports are very low (12 per 1,000; USDHHS, 2006), and thus evaluations would require large sample sizes with appropriate comparison groups. Second, these interventions would have to be inexpensive enough to be offered universally and, thus, may not be able to address the complex problems typically found in families with child maltreatment. One approach to this problem is to offer a series of interventions that include universal and targeted components such as Sanders' Positive Parenting Program, or Triple P (Sanders, Cann, & Markie-Dadds, 2003). Triple P has a set of behaviorally based tiered intervention strategies that start with the entire community but vary in duration and intensity according to the needs of each family. Intervention can range from a single-session consult to a multisession treatment and can be conducted in individual, group, or a self-directed format. By varying intensity based on need, Triple P can be offered to everyone and still provide sufficient attention to those needing more services. However, whether this approach can prevent child maltreatment remains to be established.

Limitations of This Review

There are a number of limitations of this review. First, only interventions identified in our search were reviewed and, thus, may not have captured the full range of intervention strategies that have been attempted. This is especially problematic as evaluated and nonevaluated programs were included to show the types of intervention efforts that have been implemented and/or evaluated for the primary prevention of child maltreatment. Quantitative summaries of evaluated programs attempt to determine the presence of a "publication bias"; however, because the goal here was different, there is no way to know what was missed. A second limitation is regarding the assignment of programs to risk factors. Most program descriptions contain limited information about the specific intervention components, and, in addition, many program descriptions often do not explicitly state the risk factors they are attempting to change. Thus, the risk factors a program may

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have attempted to change were often inferred from the intervention activities, and there may have been misclassifications of interventions to risk factors. Finally, coding of studies was done by a single coder, and thus reliability of assigning interventions to risk factors could not be determined.

Conclusions

Public health approaches to violence prevention, including the prevention of child maltreatment, emphasize primary prevention (Hammond, Whitaker, Lutzker, Mercy, & Chin, 2006; Whitaker et al., 2005). This review found a large number of primary prevention programs for child maltreatment that addressed a broad range of risk factors. Yet few have been rigorously evaluated, and, of those, only a handful has demonstrated impact on child maltreatment or its risk factors. From a public health perspective, evaluation of existing interventions and the development of new preventive interventions should target prevalent and, heretofore, neglected risk factors such as poverty, social norms tolerating violence toward children, partner violence, and teenage pregnancy. In addition, from a cost-containment perspective, more attention should be given to low-cost interventions delivered to the public, by the public, or that require minimal effort from recipients. Effective prevention of child maltreatment is a public health imperative, not only for preventing the immediate injury and health impact but also for preventing its long-term health, social, and economic consequences.

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