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Integration of Adverse Childhood Experiences Across Nursing Curriculum☆

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ABSTRACT

Adverse childhood experiences (ACEs) devastate the lives of children, families and the community. Nearly 35 million children in the United States (US) have experienced one or more types of childhood trauma and nearly a third of youth between ages 12 and 17 have experienced two or more traumatic events. Adverse childhood experiences place an economic toll in the U.S., costing between $5.8 billion and $12.6 billion annually. Child maltreatment costs $124 billion, conservatively. Health Professionals play a major role to prevent and effectively intervene in ACEs. To this end, building a nursing workforce with necessary ACEs knowledge is critical as nursing graduates can make a sustainable impact as they translate knowledge in practice to improve health and health outcomes for children, families and communities. This paper describes how a College of Nursing initiated a systematic integration of ACEs knowledge across BSN curriculum from designing an ACEs Curriculum Integration Model, engaging and enabling faculty in the integration process and how ACEs concepts and contents were integrated. Suggestions are made for ongoing work and evaluations of the effects of ACEs curriculum integration.

Adverse childhood experiences (ACEs) devastate the lives of children, families and the community. The ACEs landmark study has documented that higher incidents of childhood maltreatment translate into greater risks for child maladaptive behaviors, chronic disease, early death and high risks for future victimization before the age of 18 years old (Felitti et al., 1998). ACEs are characterized by health threatening problems such as neglect, physical, sexual, or psychological abuse, family violence, intimate partner violence, substance use, parental divorce or separation and incarcerated family members (Centers for Disease Control and Prevention, 2016). The most prevalent health problems related to ACEs are physical abuse (28%), household substance abuse (26.9%) and parental separation or divorce (23.3%) (Centers for Disease Control and Prevention, 2016). Nearly 35 million children and youth in the United States (U.S.) have experienced one or more types of trauma related to ACEs (Stevens, 2013). Persons with four or more documented ACEs are at the highest risk for developing health problems (Felitti et al., 1998).

ACEs place an economic toll in the U.S. costing between $5.8 billion and $12.6 billion annually (Gerson & Corwin, 2015; Szilagyi et al., 2016). In addition, the estimated costs for child maltreatment in the U.S. is $124 billion annually (Centers for Disease Control and Prevention, 2012; Fang, Brown, Florence, & Mercy, 2012; Gerson & Corwin, 2015). The prevalence of ACEs coupled with drastic effects of health-associated problems and high economic costs warrant educating health professionals about ACEs awareness and prevention. However, many health professionals including nurses have indicated their unmet needs about ACEs knowledge in their education and clinical practices (Al-Yateem, Banni Issa, & Rossiter, 2015; Corwin, Anda, & Felitti, 2015; Szilagyi et al., 2016).

To date, ACEs topic-specific education for health professionals has focused on child abuse and neglect (Chen, Fetzer, Lin, Huang, & Feng, 2012; Raman, Holdgate, & Torrens, 2012), toxic stress, childhood trauma, resilience and trauma-informed care (Hornor, 2015; Strait & Bolman, 2017). Nonetheless, a systematic integration of ACEs knowledge across curriculum for health professionals remains absent in the literature. Nursing is the largest profession of health care providers (U.S. Bureau of Labor Statistics, 2015) and has over 4 million nurses actively practicing in healthcare settings (The Henry J. Kaiser Family Foundation, 2017). Building the nursing workforce capacity with ACEs knowledge and skills is needed to prepare nursing graduates to make a sustainable impact as they translate knowledge in practice to improve health and outcomes for children, families and communities. Therefore,

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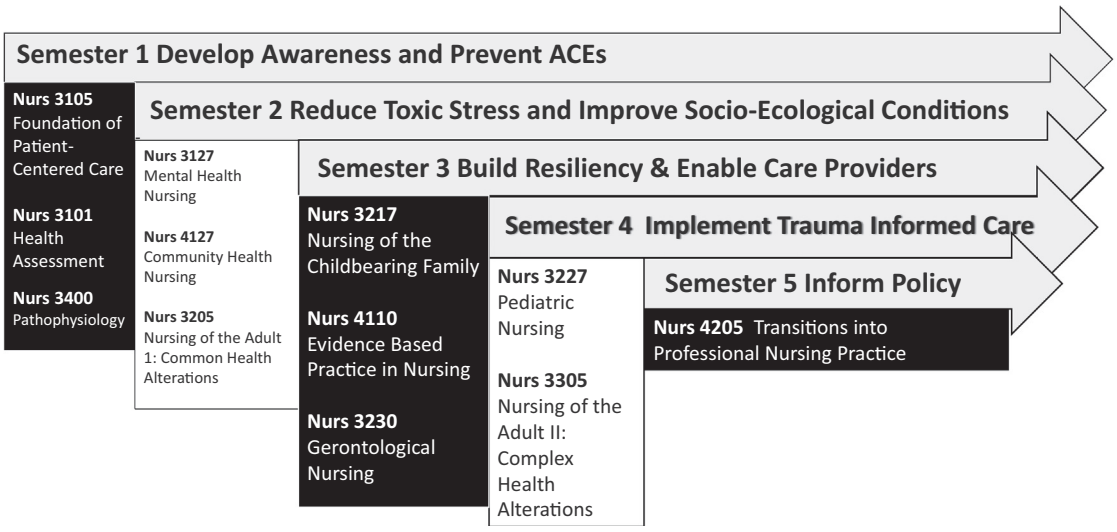

Fig. 1.0. Loewenberg College of Nursing ACEs Curriculum Integration Model.

the importance of ACEs education for nursing students prompted the Loewenberg College of Nursing (LCON) to initiate a systematic integration of ACEs and related concepts in the curriculum of the Bachelor of Science in Nursing (BSN) program and the initiative has been funded by the Urban Child Institute in Memphis (2016–2019).

ACEs education in health professions

ACE awareness spawned from medicine has gained widespread interest in multiple settings like school systems, higher education, criminal justice and policy arenas (Felitti, 2017). Nevertheless, health professionals practicing at the frontline of care have been slow to detect clients at high risk for health problems associated with ACEs. Educating health professionals including nursing students about ACEs is pertinent to ascertain the harmful effects of ACEs on health. Current literature has documented time-limited and/or graded variations of ACEs education/training. For example, a Child Advocacy Studies Training program was studied to examine the effect of educating first-year medical students about child abuse prevention and intervention by taking a two-semester elective course. The study found that first-year medical students felt prepared to identify and report signs of child maltreatment and recommend services for abused children (Knox, Pelletier, & Vieth, 2014). Another study found that graduate students from nine health professional programs at two campuses reported being more familiar with clinical and scientific findings of ACEs and trauma-informed care after they completed a three-week training (Strait & Bolman, 2017). Finally, another example of ACEs education in health professions is a continuing education article written for pediatric nurse practitioners regarding childhood trauma, toxic stress, resilience and use of screening checklists to identify abuse and neglect (Hornor, 2015). The above-mentioned training and educational offerings have made efforts to educate health professionals about ACEs; yet, no systematic integration of ACEs curriculum in an educational program has been documented.

ACEs need to be an integral component of nursing curriculum to equip graduates with essential ACEs knowledge and skills in clinical prevention, population health, health promotion and disease prevention to create a culture of health for diverse groups and communities (American Association of Colleges of Nursing, 2011; Robert Wood Johnson Foundation, 2017). To prepare the nursing workforce with necessary knowledge for promoting health for children and families, LCON designed and initiated a systematical integration of ACEs across BSN curriculum. The project involved developing the ACEs curricular model, selecting key courses for integration, engaging faculty with the integration process and designing future studies.

ACEs Curriculum Integration Model

The ACEs Curriculum Integration (ACI) Model stems from the Culture of Health (COH) Action Framework developed by the Robert Wood Johnson Foundation (RWJF) in partnership with the RAND Corporation (Robert Wood Johnson Foundation, 2017). The COH Action Framework is an exemplar framework to illustrate building health equity (Plough, 2015a). Health equity is the highest attainment of health for all people and an overarching goal of the ACI Model (Healthy People, 2018). The four major constructs of the COH Action Framework are: a) making health a shared value; b) fostering interdisciplinary collaboration; c) creating healthier, more equitable communities; and d) strengthening integration of health systems and services (Robert Wood Johnson Foundation, 2017).

The ACI Model was developed to guide ACEs curriculum integration in the BSN program. The model follows a scaffolding approach to teaching and learning through building concepts across the five semesters of the BSN curriculum. Major conceptual constructs of the ACI Model are: a) develop ACEs awareness and prevention, b) reduce toxic stress and improve socio-ecological conditions, c) build resiliency and enable care providers, d) implement trauma-informed care and e) inform policy (Fig. 1.0). Conceptual definitions and propositions in the ACI Model will be discussed followed by a description of courses selected for curriculum integration.

Develop ACE awareness and prevention

ACEs awareness is a process of informing health professionals and the community about key ACE categories of abuse, neglect and household dysfunction along with the role of emotional trauma impacting on mental, physical and behavioral health of individuals and the communities (ACE Awareness Foundation, 2017; Al-Yateem et al., 2015; Robert Wood Johnson Foundation, 2017). ACEs prevention involves implementation of sustainable solutions to reducing toxic stress attributed to ACEs formation and building resilience in families (ACE Awareness Foundation, 2017; Robert Wood Johnson Foundation, 2017). Because each of the ACEs is highly interrelated, it is important that prevention efforts target a variety of ACEs rather only single types (Anda, 2017). Common ACEs preventive efforts focus on promoting nurturing relationships and safe environments such as: a) home visitation to pregnant women; b) parenting training; c) intimate partner violence prevention; d) teen pregnancy support; e) mental illness treatment; f) high quality child care; and g) supports for lower income families (Vetro Violence, 2013). Successful ACEs prevention requires

integrated care systems with health professionals to provide screenings to identify "at risk" adults and children for poor health outcomes attributed to ACEs (Madsen-Thompson & Klika, 2015).

Reduce toxic stress

Stress induces a normal physiologic response and is experienced developmentally throughout human lifespan. Children can learn from supportive and nurturing adults or parents how to cope with the various types of stress by developing effective coping strategies that can help children adapt to new or life threating situations (Middlebrooks & Audage, 2008). Three types of stress acknowledged in the literature are positive stress, tolerable stress and toxic stress. Of the three types of stress, toxic stress contributes to the proliferation of ACEs. Toxic stress refers to experiences of strong, frequent or prolonged adversity such as physical or emotional abuse, chronic neglect, caregiver substance abuse or mental illness, exposure to violence, or the accumulated burdens of family economic hardship without adequate adult support (Centers on the Developing Child Harvard University, 2017).

Toxic stress in early childhood can lead to lifelong adverse physical and mental health. Hazards of prolonged toxic stress may show up in childhood as asthma, obesity and type 2 diabetes (Anda et al., 2006; Brown, Young, Anda, Felitti, & Giles, 2006). Increased levels of stress hormones can lead to prolonged wear and tear on multiple organ systems. Significant research data show physiologic responses to prolonged and untreated toxic stress across the lifespan (Felitti et al., 1998; Johnson, Riley, Granger, & Rills, 2013; Magen & DeLisser, 2017; Shonkoff et al., 2012). Untreated toxic stress contributes to poor outcomes in adults including alcoholism, depression, cancer, obesity and heart disease along with a plethora of other diseases (Danese et al., 2009).

Reducing toxic stress begins with screening individuals and families for risk factors and protective factors. Social isolation, poverty, unemployment, low education, single-parent home and intimate partner violence are primary factors for toxic stress (Franke, 2014). In contrast, a caring and supportive adult, structured school environment, access to healthcare services and participation in community events or organized activities are protective factors (Franke, 2014). Toxic stress treatment focuses on efforts to manage stress and build resilience in children and adults to produce stability in families and communities. Health professionals must understand toxic stress and ways to reduce it because of the damaging effects on human development.

Improve socio-ecological conditions

The term of socio-ecological conditions is used interchangeably with social determinants of health. Social determinants of health are social, economic, behavioral and physical environmental conditions in which people are "born, live, learn, play, work and age" that influence health and quality of life outcomes of individuals and communities (Centers for Disease Control and Prevention, 2014; Healthy People, 2017; World Health Organization, 2017). Social determinants of health refer to identifiable "causes of the causes" of poor health outcomes (Compton & Shim, 2015). Addressing social determinants is important in achieving health equity in which everyone has opportunity to access healthcare and attain health (Centers for Disease Control and Prevention, 2014).

ACEs are an example of how social conditions negatively influence the well-being and health of children, families and communities. Examining social determinants of health and gaining an understanding of the causal nature of multiple illnesses attributed to ACEs, students may gain broad perspectives of social conditions related to health and illness. By studying social determinants of health, students learn valid screening tools to identify social conditions and resources to address concomitant health problems to the extent of building a healthy culture (Chung et al., 2016).

Build resiliency

Resiliency is a complex concept. Bronfenbrenner's work influenced early writings about resiliency by linking individuals and socio-environmental systems with ecology (Bronfenbrenner, 1977; Howell & Miller-Graff, 2014). Conceptualizations of resiliency emerged over the past four decades have shifted from negative connotations such as maladaptive risks to positive descriptions of overcoming stress, misfortune, or tragedy (Bowes & Jaffee, 2013). While definitions of resiliency vary, most definitions include significant encounters with adversity and positive adaptation responses (Bowes & Jaffee, 2013; Luthar, Cicchetti, & Becker, 2000). Descriptions of positive adaptation responses of resiliency noted three domains of protective factors: individual, relational and contextual (Greenberg, 2006; Ungar & Liebenberg, 2011). The *individual domain* includes social skills, even-temperament, problem-solving skills and hardiness that contribute to protective functioning (Greenberg, 2006; Ungar & Liebenberg, 2011). The *relational domain* refers to a sense of security and safety found in close relationships, whereas, the *contextual domain* has a broader sense of belongingness found in community support including spiritual, educational and cultural cohesiveness (Greenberg, 2006; Ungar & Liebenberg, 2011). Resiliency is an ordinary response or learned process of adapting well to adversity, trauma, tragedy, or any sources of toxic stress (American Psychological Association, 2018; Masten, 2001). Building resiliency occurs at the individual, family and community levels as well as through legislation and policy aimed at achieving health equity. A few examples of promoting resiliency include access to mental health services and treatment centers for victims of violence, development of child advocacy centers and parenting classes, promoting Nurse-Family Partnerships and participation in community activities that support building resilience.

Enable care providers

Enabled care providers are ACEs-informed health professionals working together and collaborating with local government or community agencies to improve health equity and consequently, build a culture of health (Plough, 2015b). Health care providers may include health professionals from medicine, nursing, pharmacy, dentistry, psychology, public and community health and allied health. Building a culture of health requires health professionals, community leaders and individuals to break down barriers to achieve improved health and health equity (Robert Wood Johnson Foundation, 2017). ACE-informed health care providers also empower caregivers at home and in the community to improve health through education about ACE awareness and prevention strategies.

Implement trauma informed care

Traumatic experience refers to a series of physical or emotional debilitating circumstances experienced by children or adults (Substance Abuse and Mental Health Services Administration, 2015). Hopper, Bassuk, and Olivet (2009) noted: "Trauma-informed care is a strengths-based framework that is grounded in an understanding of and responsiveness to the impact of trauma, that emphasizes physical, psychological and emotional safety for both providers and survivors and that creates opportunities for survivors to rebuild a sense of control and empowerment" (p.132).

Traumatic experience leaves the person at risk for feeling traumatized and thus the neurophysiological system for handling stressful events can be impaired. Trauma-informed care (TIC) in healthcare systems and organizations realizes the impact of trauma, recognizes the signs and symptoms of trauma and integrates trauma-informed language into policies, procedures and practices (National Council for Behavioral Health, 2018). Established TIC in the healthcare systems ensures that children and adults with traumatic experiences can seek

quality care through supportive counselors who help build trust and gain insights to healing. Health professionals provide TIC through treating a whole person, taking into account past trauma and helping survivors rebuild a sense of control and effective coping mechanisms when treating the patient (Sege & Harper Browne, 2017; Withers, 2017) and taking actions to prevent re-traumatization (Boles, 2017).

Inform policy

Informing health policy refers to decisions, plans and actions undertaken to achieve specific health care goals within a society (World Health Organization, 2018). Health policy related ACEs has focused on childcare instability and maltreatment resolution (Adams & Rohacek, 2010), trauma-informed care practices (Bowen & Murshid, 2016), domestic and family violence (Hines, 2015; Raeder, 2014), human trafficking (Greenbaum, 2016; Smith, 2016), toxic stress and behavioral health (Shern, Blanch, & Steverman, 2016). Students must be educated how to advocate for health policies that prevent ACEs (Girouard & Bailey, 2017), eliminate health disparities, achieve health equity (Larkin, Felitti, & Anda, 2014) and improve quality of life for all.

Selection of courses for ACEs integration

To initiate ACEs curricular integration, the ACI team was formed to include several doctorally prepared faculty with expertise in curriculum design, pediatric nursing, community health nursing and evaluation research. After reviewing BSN course syllabi and building a consensus, the ACI team selected courses based on course and learning outcomes that best fit the ACI Model and set student-learning goals in each course. Table 1.0 displays the courses selected for ACEs integration per semester (To note: the ACEs curriculum is integrated with selected courses throughout five semesters' upper division nursing).

During the first semester, while taking Foundation of Patient-Centered Care students learn how to define ACEs and identify workable prevention strategies. In Clinical Pathophysiology, students learn about brain architecture and effects of trauma and toxic stress on brain development. In Health Assessment, students learn ways to assess clients for ACEs.

During the second semester, while taking Mental Health Nursing, students learn about mental health problems resulting from toxic stress exposure such as depression and post-traumatic stress disorder. In Community Health Nursing, students use the Socio-Ecological Model to examine ACEs in health disparities and to identify community-based ACEs prevention strategies. In Nursing of Adult Health 1: Common Alterations (previously termed medical-surgical course) students identify the effects of toxic stress on development of chronic health conditions such as acute coronary syndrome.

During the third semester, while taking Nursing of the Childbearing Family, students learn the care provider's role in ACEs prevention such as teaching new parents how to care for an infant. Evidence-based Practice is a nursing research course in which students compare, contrast and evaluate strength of evidence for ACEs prevention, toxic-stress reduction, trauma-informed care and resiliency. In Gerontological Nursing course, students analyze the impact of ACEs on older adults' resiliency and coping abilities.

During the fourth semester, while taking Pediatric Nursing, students learn about providing trauma-informed care and building resiliency in children, adolescents and parents or guardians. In Nursing of the Adult Health II: Complex Health Alterations (advanced medical-surgical course) students learn the impact of ACEs on critical health conditions such as respiratory failure, diabetic ketoacidosis and multisystem illnesses.

Transition into Professional Nursing Practice (nursing leadership course) is the fifth semester capstone course in the BSN curriculum. Students integrate ACEs knowledge from previous semesters to examine health policies regarding ACEs at the local, state and national levels.

Table 1.0
Courses selected per semester for integration of adverse childhood experiences.

Course Number	Course Name	Semester
NURS 3105	Foundations of Patient-Centered Care	1
NURS 3400	Clinical Pathophysiology	1
NURS 3101	Health Assessment	1
NURS 3127	Mental Health Nursing	2
NURS 4127	Community Health Nursing	2
NURS 3205	Adult 1 Common Health Alterations	2
NURS 3217	Nursing of the Childbearing Family	3
NURS 3230	Gerontology Nursing	3
NURS 4110	Evidence-Based Practice in Nursing	3
NURS 3227	Pediatric Nursing	4
NURS 3305	Nursing of the Adult II: Complex Health Alterations	4
NURS 4205	Transitions Into Nursing Professional Practice	5

ACEs curriculum integration phases of development

ACEs curriculum integration occurred in five phases including Phase 1: Onboarding, Phase 2: Brainstorming, Phase 3: Launching, Phase 4 Surveying and Phase 5 Analyzing Survey Data. To implement ACI effectively, nursing faculty need to have the state of the art knowledge about ACEs. Phase 1 involved onboarding faculty by teaching them about ACEs concepts and introducing the integration process. In a 2-hour workshop, a local ACEs expert provided a comprehensive educational overview about ACEs and related content to faculty. Select articles including the ACEs seminal study by Felitti et al. (1998) were also provided to faculty for reading.

In Phase 2, a regional expert provided a two-day ACEs educational workshop with multiple sessions. The sessions prompted brainstorming and meaningful dialogue to initiate faculty collaboration for selecting appropriate content to integrate. The team introduced the ACI Model to faculty, followed by a Q and A session for feedback. Faculty generated creative ideas about planned approaches to the curriculum integration. The team captured the faculty's ideas and provided an integration template to strengthen integration and avoid duplicative content for each semester.

Phase 3 involved launching ACEs curriculum integration. The team and faculty discussed two different integration approaches. The first approach was a cohort-lead design in which students learn ACEs concepts with each semester progression. The second approach was a blast-design in which students in all semesters are introduced to ACEs and semester specific concepts concurrently. Faculty chose the blast-design because of the defined funding timeline, the nature of an exploratory project and the need for all students to learn ACEs. Throughout Phase 3, the team provided faculty with encouragement and resources for implementing the ACEs integration in their respective courses.

In Phase 4, the team developed an electronic survey to assess how faculty integrated ACEs contents into their courses. After the team reviewed the survey for content validity, modifications of some questions were made to finalize the survey. The survey design allowed the team to collate data about ACE-related concepts, course outcomes, student learning outcomes, class topics, measurement of student learning and teaching resources used in each course. The ACI survey included faculty name, the course name, identification number and six questions listed in Table 2.0. An example of a completed survey is presented (See Appendix).

Phase 5 involved the analysis of survey data related. Results of the analysis guided the development of an ACEs curricular concept map for future integration in BSN clinical courses and courses in the graduate nursing programs.

Discussion

While ACEs education was offered to health professionals and

Table 2.0
ACEs curriculum integration faculty survey questions.

Question One: What are the ACE-related concepts covered in this course?
Question Two: What are the course outcomes related ACE content?
Question Three: What are the student learning outcomes related to ACE content?
Question Four: What are the class topics covered in the course related to ACEs?
Question Five: How were learning outcomes for ACE-related content measured in this course?
Question Six: What resources were used for teaching ACE-related content in the course?

students, no systematic integration of ACEs across educational curriculum existed. Strait and Bolman (2017) limited their ACEs education curriculum to 6 h of volunteer training, non-credit course over three-weeks across two campuses. Knox et al. (2014) offered an ACEs education elective course with 20 h didactic and 2 to 4 h practicum over two semesters for the first year medical students. Only one study included an ACEs framework with three concepts: ACE awareness, trauma-informed care and violence (Strait & Bolman, 2017). Another study included eight concepts with the primary focus on child maltreatment, but no framework was noted (Knox et al., 2014). Additional educational efforts are needed for health professionals to learn about the deleterious effects of ACEs in the lives of clients they serve.

The LCON ACEs curriculum integration in the BSN program is evidenced-based, conceptually-designed, process-enabled and faculty-engaged. The ACI Model builds on concepts at each semester: a) Semester 1 - develop ACEs awareness and prevention; b) Semester 2 - improve social ecological conditions and toxic stress reduction; c) Semester 3 - build resilience and enable care providers; d) Semester 4 - implement trauma informed care; and e) Semester 5 - inform policy. The ACI Model serves as a framework showing conceptual progression from semester 1 to semester 5 and directs students' learning from knowledge comprehension to knowledge application and synthesis.

The integration process was engaging, empowering and enabling in which faculty were developed and engaged in learning, dialoguing, designing and integrating ACEs concepts in their respective courses. During the two-year experience, the ACI Model has enabled nursing faculty and students to co-learn and co-teach key ACEs concepts and related content. ACEs experts led workshops and ACEs related literature have supported faculty in ACEs integration. The team provided support, guidance and leadership for faculty engaging in this major undertaking and the Urban Child Institute's grant support has provided needed resources to execute this initiative.

A systematic integration of ACEs concepts in nursing programs empowered faculty to educate students with necessary ACEs knowledge and skills and prepare graduates for making an impact on ACEs prevention, toxic stress reduction, trauma informed care, building resilience and informing health policies. As students transition into professional nursing practice in multiple healthcare settings, they will continue to develop professional roles and translate learned knowledge and skills including ACEs to direct patient care and improve patient outcomes.

ACEs integration in clinical courses is needed to prepare students for assessing patients for ACEs when clinical partners have not yet incorporated this practice at the bedside. New opportunities exist in clinical practice to build nursing leadership at the point of care by initiating ACEs screening in collaboration with the healthcare teams. Early identification of ACEs combined with appropriate interventions can prevent lifelong health consequences in patients exposed to multiple traumatic events (Hornor, 2015; Flynn et al., 2015). ACEs screening should be a two-step process starting with asking patients "*what happened to you*?" rather than "what is wrong with you?" The second step should be using a resilience screen to inform healing and recovery. Resilience questions are important to incorporate with ACEs screening because these questions point out resources that clients have or need, thereby directing health professionals about how to help clients build resources to combat ACEs (Stevens, 2014).

The ACEs curriculum integration using the designed ACI Model will lay the foundation for future research about teaching and learning ACEs knowledge in nursing. Future research is essential to evaluate effects of the ACEs curriculum integration on student learning, faculty teaching and clinical practice. We plan to conduct focus group interviews with nursing faculty to gain insight and meanings of their ACEs integration and their identifications on areas for continuous improvement of the integration. Likewise, nursing graduates will be interviewed to share their perspectives on learning about ACEs and to discuss how to use ACEs' knowledge and skills in practice. While formative evaluations in didactic and clinical courses have measured student learning about ACEs in separate courses, a longitudinal study is designed to evaluate the net effect of the systematic ACEs curriculum integration across nursing programs by following students from their first semester to their graduation.

Conclusions

Adverse childhood experiences have harmful effects on health of children, families and communities. Health professionals can make a difference by raising ACEs awareness, using ACEs prevention strategies, reducing toxic stress, practicing trauma informed care, enabling care providers and informing health policies and ultimately building a culture of health for all. Educating future health professionals needs systematic integration of ACEs curriculum across educational programs. The ACEs curriculum integration in the BSN program was initiated with the aim to build a nursing workforce capacity with necessary and much needed ACEs knowledge. Work continues to integrate ACEs in clinical and graduate courses. Interprofessional education about ACEs is needed as preventing ACEs requires collaborative efforts. Health professional and nursing education programs may adopt the designed ACI Model to educate students about ACEs knowledge that guides practice and policy development emphasizing building a culture of health for urban children, families and communities.

Declaration of interest

None.

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Appendix A. Supplementary data

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