

SHORT COMMUNICATION

The importance of early childhood in addressing equity and health literacy development in the life-course

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ABSTRACT

Health literacy is recognized as a significant driver of health equity. Most research and interventions involve adults, but the focus on children's health literacy is increasing rapidly. Early childhood is yet to be considered an important target for tackling health literacy problems in the life-course despite being a critical stage for establishing the prerequisites for the skills, behaviours and actions known to be the main components and outputs of health literacy. A new developmental science of childhood, informed by findings from neuroscience, epigenetics, molecular biology, social sciences

and childhood development, emphasizes the importance of early childhood for health, development, learning and behaviour in a lifetime. In this context, a major role is played by adversities, toxic stress and executive function (EF), as well as social disadvantage and chronic poverty, which are particularly detrimental to healthy child development and therefore detrimental to health literacy development. Policy and intervention should focus on early childhood development and on addressing the social determinants of adversity to sustain equitable health literacy development in the life-course.

Keywords: HEALTH LITERACY, HEALTH PROMOTION POLICY, EARLY CHILDHOOD, TOXIC STRESS, EQUITY AND POVERTY

INTRODUCTION

The Shanghai Declaration on promoting health in the 2030 Agenda for Sustainable Development highlighted health literacy as a critical determinant of health and identified it as significant in sustaining health equity (1). Similarly, government public policies and policy documents from various nongovernmental organizations on health literacy emphasize the critical role of health literacy in addressing health equity (2). In order to reduce inequities in the life-course and to achieve the Sustainable Development Goals (SDGs), the suggested focus has been shifted to children and schools (1, 2), and this short communication argues that early childhood is of equal importance.

Before children reach school age, developmental processes in the early years of life are critical for health, learning, abilities and behaviour in the lifetime (3–5), making early childhood an important target for programmes and policies. A new developmental science of early childhood also referred to as the “new developmental science of childhood adversity” (6) has formed recently and is informed by compelling new knowledge from neuroscience, epigenetics and molecular biology as

well as social sciences and childhood development (3–9). It provides substantial evidence on how chronic exposure to adverse social conditions and environmental factors early in life has a detrimental effect on children's cognitive and social development and abilities, leads to serious lifetime health and behavioural consequences, and is associated with the development of chronic diseases across the life-course (3, 5, 6, 10). Children who are already disadvantaged and living in poverty are at the highest risk of exposure to these adverse effects (3, 5, 11–15). Findings suggest that health promotion programmes and policies must first address the social determinants of adversity in the early years (distal, intermediate and proximal factors) to ensure healthy development in their lifetime (3, 4). This makes early childhood an important target in influencing the foundations of health literacy skills, particularly by adopting structural and determinants-based approaches, such as addressing the physical, social, political, and economic environment in which children grow up as well as strategies to address social-ecological factors, policy change, poverty, inequality, living conditions and redistribution of resources.

Addressing early childhood for healthy development based on neuroscience is not new per se and it comes with a degree

of criticism. While the criticism is not directed towards the neuroscientific evidence itself, it does target the rise of the Early Years Movement and the emergence of a so-called neuroculture in parenting policies in English-speaking countries (16–18). Attached to this neuroculture is a misinterpretation of neuroscience and misuse of evidence for false claims about parenting used in social, welfare and health policies as well as popular media and culture (16, 17). Whereas neuroscience and child development literature suggest addressing adverse social conditions and environmental factors such as poverty, social inequality and class (3–7), by contrast, these so-called neuropolicies reduce the environment to the parents. This is then referred to as neuroparenting, placing parents at the core of early childhood interventions, blaming poor parenting for worse developmental and health outcomes in children, and thereby spreading anxiety and insecurity among parents, which culminates in further burden for both the parent and the child (16–18). These neuropolicies divert attention away from the actions and policies targeting the root causes of inequities and adversities that affect the context in which parenting takes place. These concerns should be taken into account when addressing early childhood development through a neuroscientific lens.

The aim of this short communication is to raise awareness of early childhood as a critical stage of life for addressing the determinants of health literacy development, especially among policy-makers and planners involved in government ministries, departments and agencies as well as those in public health. To better understand the new early childhood development science and how it relates to the determinants of health literacy development, some of its core concepts such as adversity, toxic stress and executive function (EF) will be briefly discussed. This will shed light on how adverse life experiences and associated toxic stress affect children's development and the formation of EF. Finally, the conclusion will set out the implications for health literacy research, policy and practice.

ADVERSITIES

Exposure to adverse life events in early childhood influences health and development in the life-course by biologically embedding adversities or by cumulative damage over time (3). Childhood adversities refer to stress suffered by children early in life, such as maltreatment, domestic violence, sexual abuse, parental mental health problems, substance abuse, discrimination, social isolation, uncertainty and poverty (5, 6, 12, 19). Adversities can affect any stage of life, but

childhood in particular “can be broken by the adversities of life in a harshly exploitative society” (6). Chronic exposure to adversities can seriously affect life trajectories and amplify health inequities, especially if experienced during sensitive developmental periods in children's first years, when their brains and organ systems develop, and they undergo rapid cognitive, physical, social and emotional changes (3–7). In this context, two concerns should be mentioned. First, in relation to brain development, it should be noted that the above-mentioned neuropolicies on parenting neglect the fact that the brain is characterized by plasticity rather than being fixed, as is often claimed (16–18). As this fact was overlooked, parenting (instead of environmental adversities) in those policies has become even more of a target for early childhood interventions. This is because the narrative inherent to these claims is that damage done to the brain cannot be repaired, which is not based on available neuroscientific evidence (17, 18). In fact, there are windows of opportunity throughout life and the brain is adaptive for changes in life trajectories. Second, neuropolicies ignore children's capability for agency by reducing them to the biology of the brain rather than the sociology of their embodied lives, which is seen as a reductionist view and leaves children vulnerable (18). This disregards the resilience of children and stands in contrast to the evidence provided by the new sociology of childhood, which together demonstrate that children are social actors, who actively take part in the construction of their world and are capable of shaping their own lives regardless of the social, economic and political circumstances in which they grow up (18, 20, 21). Regarding children's reactivity to environmental influences, neuroscientists largely agree with sociologists and have introduced theories of differential susceptibility to environmental influences and biological sensitivity to context (3, 6, 7, 14). In the context of adversity and stress reactivity, both these theories state that highly reactive children are, on the one hand, more vulnerable to adverse environmental influences and, on the other hand, more adaptive to positive environments and benefit more than children who are less sensitive and vulnerable (7, 14). Regardless of claims-based neuropolicy, adversities represent a serious threat to child development. Therefore, in 2009 WHO and the United States Centers for Disease Control and Prevention launched their Global Research Network on Adverse Childhood Experiences (ACEs) to raise awareness of serious public health consequences of childhood adversities and to inform public health surveillance, such as monitoring systems and national and international surveys (22).

Research evidence has linked exposure to adverse environmental influences and risks in early childhood to

a lasting impact on health, social, behavioural and cognitive outcomes in later life (7–15), as well as to changes in epigenetic pathways and brain architecture, which in turn can affect other body systems (3–9). In short, epigenetic mechanisms control how gene instructions are carried out and thereby how genes are expressed (the action of the gene), a process that occurs without changing the gene or DNA itself (8). The available evidence base is growing rapidly (5, 12, 15, 23, 24), which indicates the potential of health promotion policy and action to address the social determinants of adversities early in life and thereby reduce inequities in child development and lifetime health, learning and behavioural outcomes (3–6). To further understand the biology behind adversities and their detrimental effect on healthy development in the life-course, the following stress taxonomy helps to categorize stress, declaring toxic stress as the greatest threat to healthy development (3–9).

TOXIC STRESS

Closely linked to adversities, toxic stress is the nucleus of a new type of developmental research rooted in neuroscience, epigenetics, biology, social science and childhood development (5). In 2005 the National Scientific Council on the Developing Child introduced a model of stress experience in young children differentiating between three forms of stress (19): (i) positive stress, (ii) tolerable stress and (iii) toxic stress. This model goes beyond the traditional stress paradigm that has been used in health and social sciences for many years and links stress to significant findings from neuroscience, molecular biology and epigenetics (3–5). In short, positive stress is characterized by a brief increase in heart rate and a slight uplift in stress hormone levels. Positive stress is a critical factor in healthy child development and can occur during stressful events (such as sadness, frustration, social problems or health treatment) while having an adult caregiver to support the child in dealing with and overcoming the situation. Tolerable stress is time-limited and experienced during serious but temporary stress responses that are lessened or moderated by supportive relationships with adult caregivers; without these supportive relationships such stress might have damaging effects on the brain architecture (through prolonged stress and impact on epigenetic mechanisms). Toxic stress is experienced as chronic and uncontrollable stress without an adult caregiver available to help the child cope with the stress. Toxic stress is considered the most harmful type of stress as it is linked to a prolonged activation of the child's stress response system (4). In reading the taxonomy and how much it refers to adult caregivers and their role in addressing childhood stress, it becomes clear that this can easily be misinterpreted to address parenting as the primary solution

in the context of adversities and associated stress. However, as was shown earlier, this in fact calls for a determinants-based and equity-related approach to address the root causes of social inequality that impact the parenting context. This is supported by a substantive body of work that has identified several risk factors for toxic stress such as poverty, adverse living conditions and further stressors resulting from social factors and position as well as abuse and caregiver mental illness (4, 5). Poverty, especially chronic poverty exposure and poverty-related risks, is understood to be among the most hazardous forms of adversity children can face during early development with negative impact on lifetime health outcomes, educational achievement, learning ability and health behaviour (4, 6, 11–15). In addition, chronic poverty exposure increases the cumulative risk of experiencing further disadvantages (5). Our understanding of the relationship between poverty and brain development is supported by emerging evidence demonstrating that poverty-related toxic stress can seriously affect the development of children's EF (11–15).

EXECUTIVE FUNCTION

Researchers have proposed different theoretical models and definitions of EF, making it a broad construct (25). A common theme of EF models is that they represent the brain's higher-order cognitive skills related to working memory, inhibitory control, and mental flexibility (25–27). EF development starts early in childhood, but full capacity is only available in early adulthood (28), which is in line with the earlier statement on the plasticity of the brain and proves that neuropolicies are claims-based and not verifiable by evidence. Evidence from developmental neuroscience and education research provides innovative knowledge on EF's crucial importance for education, school readiness, academic achievement and learning capability in children and throughout life (26, 29–31). Research also shows how adversities in general, and chronic poverty in particular, lead to toxic stress with negative impacts on child development and children's EF skills (11, 13–15, 32). As a chronic stressor in children, poverty is associated with numerous negative biological outcomes, such as higher allostatic load, lower EF ability or compromised self-regulation (13, 14), which makes it a key predictor of healthy EF development. EF development is critical to the core components and output factors of health literacy, such as attention regulation, recall of information, relating knowledge, cognitive, social and emotional skills, early literacy and numeracy, decision-making, problem solving, critical thinking, resilience, health and social behaviour, school readiness and academic competence (5, 8, 9, 24–28). Healthy development of EF will make it more likely for a child to develop

the skills and responsiveness to health literacy. It is important not to confuse this with a behavioural approach to health literacy or a portrayal of health literacy as an individualistic concept. On the contrary, this is to ensure that children have equal opportunities for healthy EF development at all. Moreover, with regard to an emerging field of study that focuses on the social practices of health literacy and how health literacy can be conceptualized as a resource distributed among an individual's social network instead of health literacy outcomes being dependent exclusively on individual capacities (33–39), health literacy goes well beyond individual skills and knowledge. The resources necessary to deal with health-related knowledge and information, making health decisions and taking health action may also be available in an individual's social network (i.e. parents, spouse, peers), which can help people address health challenges. This social approach also aligns very well with the determinants-based approaches suggested herein. Nevertheless, EF development should be supported universally but particularly in children from low-income and disadvantaged families. To support healthy EF development, the Center on the Developing Child at Harvard University provides a comprehensive framework of recommendations, which include improving the context in which children live and grow up; creating safe, supportive, and healthy social and physical environments; and providing rich and varied activities in which children can engage (27). In contrast to the claims attached to neuropolicies, these recommendations call for an equity approach that can also include, but is not limited to, parenting interventions. Therefore, addressing early childhood development involves a determinants-based approach as does health literacy development.

CONCLUSION

To date health literacy research and policy action have mainly focused on adults but the attention on children and adolescents has been rapidly increasing. The effects of the interplay between early childhood development and the environment, including adversity, toxic stress and healthy development of EF, have not yet been considered in relation to their role as possible long-term determinants of health literacy development in the life-course. These new understandings of childhood adversities have important implications for the promotion of health literacy.

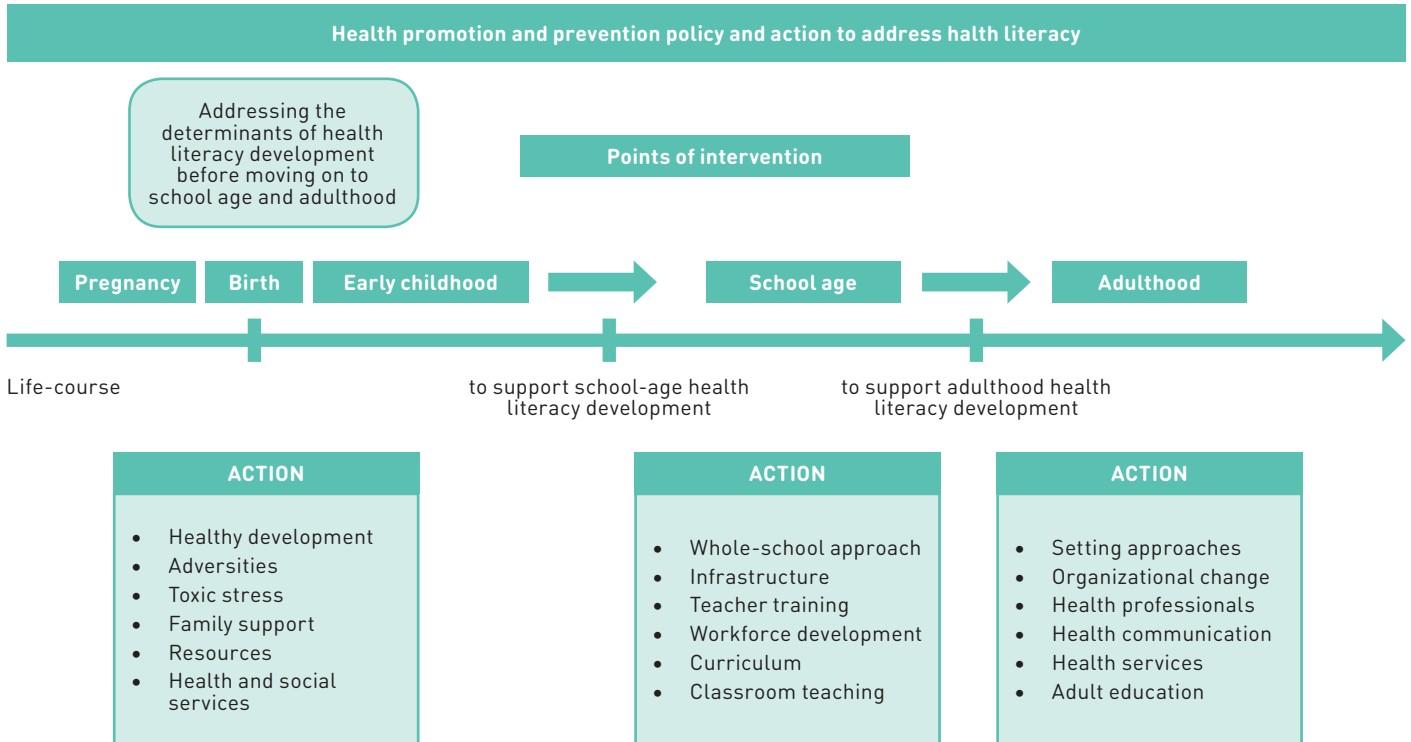
1. Health literacy research and policy need to focus on early childhood development.
2. The evidence on adversities, toxic stress and EF development strongly emphasizes the need to apply an equity-based approach to developing health literacy early in the life-course.

3. They provide an explanatory framework for the focus on early childhood interventions.
4. This new scientific understanding highlights the importance of interdisciplinary research in supporting childhood development.
5. It offers a determinants-based approach to health literacy research and policy over the life-course.
6. This approach takes into account the omissions of neuropolicies that neurobiologize parenting and neglect children's agency.

The Commission on Social Determinants of Health defined a set of principles for action to achieve health equity, of which the first, improving the conditions of daily life, specifically includes action to ensure a good start to life for every child (39, 40). The new developmental science confirms such a strategy to address the root causes of inequities in health and development and this article in particular makes the case that placing parenting as such a strategy at the heart of policies and programmes should be avoided. It adds to existing evidence about the importance of early childhood interventions and the recommendations of the Commission in informing the direction of health literacy research and policy by a) explaining how social structures and poverty impact health, education and development over a lifetime, b) improving knowledge on how and why to address the early determinants of health literacy development, and c) suggesting that health literacy policies focus on adequate support that enables all children, in particular the most vulnerable and disadvantaged ones, to thrive. To ensure a serious approach to the equity debate surrounding health literacy, early childhood must be considered critical for health literacy development throughout childhood and until adulthood, and addressed by policies and interventions as presented in Fig. 1.

Determinants-based action and policy in early childhood should be the first health literacy intervention in the life-course as only this creates the best conditions for future health literacy development. In this context, policies to sustainably reduce sources of toxic stress related to adverse living conditions (such as neglect, parental mental health problems, violence or poverty) are of critical importance, as are policies and programmes that support investments in safe and enriching environments, supportive structures and positive conditions that have a significant impact on children's development and health. Possible areas of interventions could be early care, kindergartens, pre-schools, learning environments, education and training of professional staff, child protective services, family education, mental health services, housing and living conditions, employment and working conditions of parents

FIG 1. THE HEALTH LITERACY POLICY AND INTERVENTION ACTION FRAMEWORK



or caregivers as well as financial and family support. In conclusion, research needs to be more interdisciplinary and policies and interventions need to address early childhood adversities, toxic stress, poverty and EF to address the root causes of ill health and health inequities.

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