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Coping in isolation: Predictors of individual and household risks and resilience against the COVID-19 pandemic

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ABSTRACT

The present short commentary aimed at highlighting the potential impact of lockdown specifically on parents and children's mental health. Embedded within a systemic view, it identified protective factors that may account for individual and household resilience. In the first section of this manuscript, we present the core concepts of resilience, before we highlight the adverse risks of the current COVID-19 situation on parents' and children's mental health. We provide evidence that parents and children alike might be concerned by increased risks of chronic diseases, abuse, and violence. Complementarily, we report the importance of psychological needs and competences and propose ways to promote these competencies among households. Overall, this paper emphasises that psychosocial competences such as creativity, emotion regulation, or interpersonal skills may constitute important characteristics to help parents and children alike coping and even thriving in the current worldwide adversity of the COVID-19 pandemic.

1. Introduction

The global spread of the novel coronavirus (COVID-19) in late 2019 and beginning of 2020 has led most governments to restrict the movements of their populations. Many have observed a necessity to self-isolate in households for an as-yet indefinite period, with strict social distancing enforced on essential public encounters (e.g., supermarket shopping). Such a period of isolation can disrupt the family nucleus and have negative long-term consequences both for parents and for their children (Cluveret al., 2020).

The evolution of global societal tensions associated with COVID-19 alongside caregivers' need to ensure food, financial, and health security both for themselves and their household may render some emotions difficult to cope with: higher stress, helplessness, or anger are likely (Brookset al., 2020). The consequences of such a situation in households may deplete personal resources and the ability to manage stress effectively, thereby increasing the risk of parental burnout (Mikolajczak et al., 2018a). It has been shown, for instance, that prolonged exposure to high levels of parenting stress and the ability to regulate such debilitating emotions at home may be detrimental for children and may lead to a dramatic increase in child neglect and abuse (Mikolajczak et al., 2018b). Yet, conversely, and as we discuss in below, research highlights several

psychosocial competences that may assist family coping in the current adverse situation (Dercon & Krishnan, 2009).

Resilience research suggests that those who have greater access to psychological and/or socio economical resources may be better placed to respond to and cope with the risks presented by the current situation (Masten, 2014; Ungar & Theron, 2020). Followingly, that there is a need to highlight both the risks and the protective factors that may be influential in an individual or family's success at overcoming the current COVID-19 adversity, and foster resilience at multiple levels of analysis. The present commentary addresses the concept of resilience during the current lockdown adversity and highlights some potential risks- and protective factors at three levels of analysis: households, parents, and children.

2. Section 1: Resilience factors

2.1. Theoretical background

Resilience implies two components: a) the experience of an adverse situation; and (b) a positive development in spite of the context of adversity (Garmezy et al., 1984; Masten, 2001). Individuals, families, or societies who would deteriorate in the face of adversity, or solely

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maintain their functioning in adverse conditions would not be considered as resilient, due to the lack of growth inherent to the definition of resilience. Conversely, displays of positive outcomes without circumstances of adversity would also not constitute resilience, but rather competence (Masten, 2011). Resilience research usually distinguishes protective and promotive factors: *protective* factors act as moderators in the effect of harm (i.e., they act to lessen the impact of the risk), whereas *promotive* factors act as assets or resources (Masten & Barnes, 2018). The present document focuses on protective, moderating, factors.

Resilience is complex and experts have proposed various alternative views to define this concept (Ungar & Theron, 2020). The following definition highlight the multiple levels nature of resilience: “in the context of exposure to significant adversity, resilience is both the capacity of individuals to navigate their way to the psychological, social, cultural, and physical resources that sustain their wellbeing, and their capacity individually and collectively to negotiate for these resources to be provided and experienced in culturally meaningful ways” (Ungar, 2006). As the definition indicates, resilience covers aspects beyond individual levels: it is a multi-level phenomenon that describes interconnected systems, from the genetic system, and/or the individual system to the social and/or the environmental system (Ungar, 2018). Hence, resilience entails a systemic view.

2.2. Resilience as a systemic concept

Ungar’s work (Ungar, 2018) suggests that resilience is best understood as a system in which various processes continuously engage to sustain resources against stressors. A large multiplicity of a system’s parts contributes to support other parts of the system that are under stress. This implies that the larger resources in the system, the more possibilities it may find as solutions to persist, resist, recover, or thrive against a stressor. This dynamic support implies yet a trade-off: the supportive parts of the resilience system must use resources to strengthen the parts that need to overcome adversity. Hence, by promoting resources at multiple levels, one display a higher likelihood of increasing one’s ability to adapt against adverse situations, reinforce, and make the system grow.

Resilience is a multidimensional construct that can be articulated across key factors to reduce distress and foster adaptation throughout the current period of COVID-19. Following Masten’s and Ungar and Theron’s shortlists (Ungar & Theron, 2020; Masten & Barnes, 2018), we can distinguish three main domains of analyses: individual factors, interpersonal factors, and community factors. At the individual level, important factors encompass notably, but not exclusively, self-regulation skills, flexibility, or positive appraisal. At the interpersonal/family level, important factors relate, for instance, to the presence of family cohesion and belonging, active positive family coping, or co-regulation in family. At the community level, engagement in a well-functioning school, connections with well-functioning justice systems, or cultural beliefs systems appear as other examples of the multilevel system view of resilience.

As a multidimensional phenomenon, resilience varies as a function of individual differences and across domain of analyses. In that sense, resilience may be best understood as a combination of factors that are internal and external to the child, parent, and households. For instance, a family system can cope with adversity for a certain period and would not deteriorate at the first encounter with a stressor. In case of COVID-19 related harm, this multidimensionality allows for the reliance on other connected parts of the system to strengthen individuals’ coping against stressors. Furthermore, the multivariate view of resilience suggest that some individuals may display manifestations of resilience in some domains (e.g. in their professional life) but not in others (e.g., in their marital life).

It is likely that the COVID-19 situation may impact households, parents, and children in various ways, depending on the domain which is left with the least resources. While resilience has been proposed as being manifested in every individual to some extent – what Masten called

“ordinary magic” (Masten, 2001), the multidimensionality manifestation of resilience is expected vary across individual difference. Insofar as the initial state of these self-organised systems appear to be different, the impact of COVID-19 would lay in different effects. In that sense, the risks and resources are expected to co-vary as a function of the domains concerned, the quantity of stressor caused by COVID-19, the recurrence of these stressors, the attribution of the cause of this stressor, the internal neurological, and the external social, economic, political environment in which the individual and the group evolve (Luthar et al., 1999). In sum, rather than a static psychological construct, resilience in the face of COVID-19 is best understood as an outcome that is context-dependent and subject to individual differences.

The measuring of multidimensional phenomenon of resilience against COVID-19 would require multidimensional tools both for measuring risks and competence (Luthar et al., 1999). The measurement of risks could occur through the usage of a multiple-items questionnaire addressing various domains that have impacted households, parents, and children alike during the pandemic. In that light, self-reported questionnaires or interviews with families could help documenting both risks and competences associated with the pandemic. Following resilience theory, it is likely to expect sociodemographic, economic status, or family status to moderate the impact of COVID-19 either positively or negatively. More specifically, self-reported data correlating with negative outcomes would indicate risks factors. Besides, it is important to consider the severity of these negative outcomes as well as confounding factors that might add noise to measurement tools.

We can highlight a further challenge for research on COVID-19: how may research accurately measure the impact of COVID-19 on both distal and proximal factors? For instance, how does COVID-19 worsen individual’s socioeconomic status, thereby accounting as a distal risk factor? And regarding more proximal factors, how does the pandemic directly impinge their physical and mental health? For instance, one may expect the access to health services for other medical conditions to be reduce during peak of COVID-19 thereby impacting the accessibility to specific types of medical cares and routines of individuals with non-COVID-19-related pathologies. Being able to separate the impact of COVID-19 at these two levels (i.e., initial stress or stressful event that arose before and after COVID-19) are important if one is to understand the inter-group variations of the pandemic. In that sense, we could notably expect Cross-Lagged Analyses to help researchers to statistically address the moment-to-moment ongoing effects of COVID-19 on multivariate levels.

Methodologies that are used to measure protective factors may also be pondered against risks factor to fully represent a likelihood of observing resilience. As with risk factors, we could expect to measure competences through multiple self-reported questionnaires, interviews, and behavioural observations. Optimally, measuring competence in the face of COVID-19 is likely to require researchers to engage in the integration of multiple measurement tools. Methodologies that focus on competences may search to address how these moderate the impact of risk factors at multivariate levels (e.g., competences measured in households, among parents, and children, at individual levels, interpersonal levels, and community levels). Both formal and informal measurements may help researchers understanding how/what competences buffer against the effects of COVID-19. This can be achieved, for instance, through standardised questionnaires, interviews or peer nomination at school, at work, or in other social groups (Naglieri et al., 2012).

In sum, we have seen that both risks and competences are essentially multidimensional and that resilience outcome vary according to (a) the domain that is impacted by the stressor as well as the severity, the duration, and the chronicity of the stressful event acting as a risk factor; (b) the multiple individual, interpersonal, and community factors that act as buffer against those risks. We now turn to a discussion of both risk and protective factors considering COVID-19.

2.3. Section 2: The adverse risks of the current situation

2.3.1. Overview of interdependent risks at the household level

The current COVID-19 restriction may act to increase the risk of mental distress among individuals and within households. A recent review of literature conducted by Cluver and colleagues (Cluver et al., 2020) showed that a ten days prolonged period of isolation increased the risks of developing post-traumatic stress symptoms. The World Health Organization (WHO) identified Europe as the epicentre of the COVID-19 pandemic, and more than 250 million people have been placed in lockdown in Europe, as of 18 March 2020 (Henley & Oltermann). At the end of April 2020, individuals were still in lockdown, surpassing the ten-days originally investigated by Cluver and colleagues (Cluver et al., 2020). It follows then that the current situation of sustained lockdown may increase the risks of psychological distress, and post-traumatic stress symptoms observed in households.

Cluver and colleagues (Cluver et al., 2020) also identified other risk factors that may hinder the proper quality of household living: boredom-related frustration, lack of basic supplies, or financial assets. Consider, for instance, how prolonged lockdown may have short-to long term consequences: households with new-born babies that may lack peer support or babysitting solutions, increasing the risks of mental overload and increased risk of parental burnout (Mikolajczak et al., 2018a). Likewise, consider situations of adults and/or children with neurodevelopmental conditions (e.g. attention deficit disorders, dyslexia/dyscalculia, autistic spectrum disorders) who may lack educational resources that were otherwise provided by trained educators, or counselling professionals (Morrier et al., 2011). Consider further households in which adults who have lost their employment status and are now facing severe mental health consequences as a result, such as depression (Zimmerman & Katon, 2005). These experiences may now reflect the compounding of everyday family and individual stressor, by the COVID-19 pandemic, and resultant lockdown. The restriction in ability to facilitate children's needs in the areas of play, education, and friendship contacts may lead, for instance, to an increase in children's risks of obesity, cardiovascular disease, and depression (Biddle et al., 2019; Rasberry et al., 2011). Likewise the lockdown places restrictions on the ability to meet the needs of adults, and parents, which may lead among other things, to a higher risk partner violence, life dissatisfaction, and substance abuse-connected suicides (Hove et al., 2010; Knipeet al., 2018; Tucker & Wingate, 2014).

2.3.2. Risks at the parents' level

The current adverse situation is likely to result in an accumulation of stress in individuals. Indeed, there is good evidence that change in one's environment induces neuroendocrine changes in individuals' nervous system (McEwen, 2012). For instance, change in environment has been often identified as releasing stress-related glucocorticoids and neurotransmitters, notably cortisol and norepinephrine, thereby increasing the risk of weakening of the immune system and increasing risks of chronic stress-related diseases (Oken et al., 2015). Additionally, economic hardship has been associated with depression and relationship struggles in couples and parents navigating current states of uncertainty: instability that may threaten their employment status might worsen their situation (Williams & Cheadle, 2016).

Admittedly, parents may react differently to the current situation on the notable basis of individual differences, gender, socio-economic status, or perceived partner support (Kanter & Proulx, 2019). This multiplicity of interwoven factors renders the situation difficult to predict accurately. Yet, should parents perceive lockdown as an external, uncontrollable, and imposed life event, one may expect the situation to hinder psychological resources and increase parents' distress (Campis et al., 1986; Lazarus & Folkman, 1984). If the demands of the situation outweigh the available resources, one may predict an increase of stress-related psychopathology in parents, such as parental burnout (Mikolajczak et al., 2018a, 2018b). Parental exhaustion may worsen in

case of high perfectionism, and/or overinvestment in a parental role, and/or disrupted sleep patterns (Rudzik & Ball, 2016; Sorkkila & Aunola, 2020). The consequence of emotional draining in parents may predict and/or maintain maladaptive coping strategies and habits (Zeidner & Endler, 1995). Risks of increased alcohol consumption, drug abuse, gambling, video game bingeing, food bingeing, and/or pornography, are likely to reflect attempt to cope with, or consequences of, individual/parental distress (Lightsey & Hulsey, 2002; Mattebo et al., 2018; Zeidner & Endler, 1995).

2.3.3. Risks at the child level

Given the systematic influence of the COVID-19 situation, it is highly probable that children may be as affected as parents by the change in their environment, thereby affecting their brain structure (Fischer et al., 2004). In fact, one may assume the COVID-19 lockdown to reflect a dramatic event in childhood, thereby constituting what resilience research calls an "adverse childhood experience" (ACE (Turecki & Meaney, 2016)). Arguably, the current lockdown might not be perceived as adverse for every child. Yet, it remains that this context is likely to participate to increase stress-sensitivity in children's brain structure, therefore increasing the later-life risk of developing mental disorders (Tietet al., 1998). Research shows that adverse childhood experiences are cumulative and that reports of four ACEs increase by twofold the prediction of non-completion of high school, unemployment, and household poverty in adulthood (Kundakovic & Champagne, 2015). The experience of multiple ACEs is thus a major risk factor for many health conditions, predicting future development of psychopathology, future risk behaviour, and a 2.7 fold reduction of life satisfaction as reported in adulthood (Metzler et al., 2017).

There is a strong relationship between parental ACEs and children's adversity, suggesting that children whose parents have experienced significant adversity in their childhood might be at even higher risks in the current lockdown (Hughes et al., 2017). As compared with job burnout that show an increase 3% in risk of violence and an increase of 1% in risks of neglect, parental burnout predicts a 26% increase in child-directed violence and an increase of 30% in child neglect (Mikolajczak et al., 2018b). Parental exhaustion may partially account for the 40–50% increase in use of helpline to report domestic violence, notably on children (Randell et al., 2015). Hence, the current lockdown adverse situation may impact both short and long-term health in today's children and is likely to increase the risks of premature mortality (Graham-Harrison, 2020). Such data crucially inform a need to identify protective factors that may mitigate these risks.

2.4. Section 3: Psychosocial competences as protective factors

2.4.1. Psychosocial competences

Psychosocial competencies, also called "life skills", were defined in 1994 by the World Health Organization (WHO) as the capacity of a person to respond effectively to the demands and challenges of daily life (Bellis et al., 2015). Psychosocial competencies enable the individual to maintain a state of mental well-being and to positively adapt to the situations they encounter, while interacting with others and with their culture and environment in a constructive way. Psychosocial competencies are therefore closely related to the definition of resilience (Ungar, 2006). The WHO has identified ten psychosocial competencies which fall into five skill pairs: (1) problem solving/decision making; (2) creative thinking/critical thinking; (3) effective communication skills/interpersonal relationships skills; (4) self-awareness/empathy; (5) stress management/emotion regulation. Some evidence (Dercon & Krishnan, 2009) have highlighted the importance of psychosocial competencies both in parents and children, finding notably that self-efficacy, self-esteem, and educational aspirations were associated with well-being in families. Likewise, other evidence shows that psychosocial competencies determine a child's well-being and self-efficacy (World Health Organization, 1994). Psychosocial competencies appear highly dependent on the way

parents may teach these competencies to their child, thereby increasing the likelihood of foster the child's academic success, future socioeconomic status, and presumed resilience outcomes (Dercon & Krishnan, 2009).

One of the characteristics of psychosocial competencies is their application in multiple areas of life. Indeed, to be considered as a psychosocial competence a skill should reflect a potential use in different contexts (Encinar et al., 2017). To illustrate, a competence of problem solving may be used by the child (e.g., doing math exercises), in a social context with peers (e.g., playing games, solving conflicts), in every day family context with parents and siblings (e.g., negotiating a solution satisfying for everybody in the household), and at the individual level (e.g., finding solutions after having lost one's home keys). In sum, psychosocial competencies appear to be involved in positive adaptation and resilience in challenging situation. During the COVID-19 pandemic, psychosocial competencies are thus likely to contribute to fostering positive adaptation at the household, parents, and child levels.

2.4.2. Plausible protective factors at the household level

Several protective factors against the risks linked to the individual and social effects of lockdown may be identified at the household level. Due to global lockdown and social distancing, the family nucleus appears to be the main place of potential coping and adaptation in the context of COVID-19 outbreak. In that sense, psychosocial skills in households, such as interpersonal problem-solving skills and assertive communication, may foster the likelihood of family resilience and adjustment (Ahler & Greeff, 2012). Through the capacity to seek for different available resources and solutions, problem solving may further act as a protective skill in stress management and positive adaptation, both inside and outside household-related problems. Similarly, communication skills may contribute to household resilience, through both a nonviolent affirmation of person's feelings and needs, and active and empathic listening of other person's arguments, feelings, and needs. More specifically, empathic responding may buffer against risk factors that may otherwise worsen marital tensions and impede adaptive coping with stress in households (O'Brien et al., 2009).

While Cluver and colleagues's results (Cluver et al., 2020) documented how a ten days prolonged period of isolation could increase risks of psychopathology, we may suppose, conversely, that isolation in households might not necessarily lead to increased risks. Indeed, we may consider situations in which being enforced to stay indoor with one's family may act as a buffer against other risk factors at other levels of analysis. For instance, while COVID-19 forced work and schools to close, thereby requiring parents and their children to work and learn in households, staying home might, for some, foster positive bonding and positive relationships. Depending on how parents and children would appraise this change, home working and schooling may act as a protective factor (Kanter & Proulx, 2019).

2.4.3. Plausible protective factors at the parents' level

Psychosocial competencies may act as protective factors at the parents' level. Indeed, research suggested that stress management skills and emotion regulation competencies buffer against parental stress and parental exhaustion (Mikolajczak et al., 2018a, 2018b). Stress management skills imply the person's understanding of the source of stress and foster focuses on active coping strategies and available resources. To the same extent that COVID-19 might act as a risk factor through fostering an accumulation of stress in individual, stress management-related psychosocial competencies might, conversely, act as a protective factor. For instance, taking a new perspective on the adverse situation, identifying individuals within the social support network, and engaging in active coping such as help-seeking, asking for advice, planification, and problem solving. In that view, stress management skills lay upon on the psychological concept of cognitive restructuring and flexibility.

Psychological flexibility, characterised by an improved capacity to choose the responses that are best adjusted to the situation, taking

account of one's personal goals and values, is considered as a meta-cognitive process that may engage psychological competencies and thereby foster adaptability regarding changes that occurred in their environment following COVID-19. For instance, while high perfectionism has been associated with rigid cognitive patterns and negative outcomes in parenting (Campis et al., 1986; Lazarus & Folkman, 1984), cognitive flexibility may conversely predict positive adaptation in parents. Followingly, flexible behaviours and cognitions may reduce parents' likelihood to engage in maladaptive coping strategies such as alcohol, drug, and other addictive behaviours (Mattebo et al., 2018; Rudzik & Ball, 2016; Sorkkila & Aunola, 2020; Zeidner & Endler, 1995). Thus, through psychological flexibility, psychological competencies may act as protective factors against COVID-19 related risks factors.

In the context of economic hardship, psychological flexibility might allow parents to generate various possible solutions to economic-related issues. Presumably, flexibility also underlay empathetic thinking to navigate interpersonal difficulties that might result from uncertain employment status. Likewise, psychological flexibility may help mitigate the lack of financial resources through finding novel and original ways to use everyday objects. In that line, it has been proposed by theorist in organisational resilience that bricolage and improvisation acted as a foundation of resilience (Weick, 1998). Hence, it would be worth to explore the extent to which households, parents, and children with improvisation or bricolage skills may better cope against the everyday problems generated by lockdown (Webb & Chevreau, 2006).

2.4.4. Plausible protective factors at the child's level

Protective factors at the parents' level are likely to affect children, and particularly those whose brain structure is as-yet very stress-sensitive. For instance, data showed that preschool age is a developmental period where the executive functions, that notably underlay self-regulation skills and other resilience-related outcomes, seems to be crucially malleable (Diamond & Lee, 2011). This early malleability suggests that the younger the children, the more important it may be for research to identify reliable and efficient protective factors against the risks engendered by the COVID-19 situation to prevent risks of life-long psychopathology. In early childhood, parents' cognitive flexibility and adaptive coping strategies might act as a protective factor against the harm of the COVID-19 situation. Positive mother mental health, positive parenting, maternal warmth and sensitivity, and positive attachment in the mother-child relationship have been identified as factors that may mitigate the risk of the present adversity (Fogarty et al., 2019). In that view, adults may provide a secure environment for effective communication, help children regulate difficult emotions, or help them finding solutions to everyday issues.

For older children, we may consider how sports and creative activities may help to foster life skills/psychological competencies across domains. For instance, sports may act as activities wherein psychological competencies can be practiced as a corollary of play: in team play, children can practice positive communication skills, self-regulation through rules, and decision-making skills (Hodge et al., 2017). Sport may help promoting values such as social responsibility. These values might transfer to different social contexts, thereby enhancing both social and emotional learning across multiple domains (Jacobs et al., 2017). In the same line, participating to creative activities may support children in providing a better ability to cope with the current situation. For instance, previous research has shown that writing poetry can help people reprocess and express difficult emotions (Carroll, 2005). Moreover, everyday creativity (e.g., playing the guitar, painting, or writing) tends to predict positive emotions and a sense of flourishing, and correlates with a feeling of vitality in adults (Conner et al., 2016; Conner & Silvia, 2015). Among children, pretend play has shown consistent positive associations with efficient coping strategies, adjustment, and a larger array of solutions to cope with difficult emotions, notably in preschool age (Galyer & Evans, 2001; Goldstein & Russ, 2000; Hoffmann & Russ, 2012). In sum, these activities may prove a cost-effective strategy to foster resilience in the

face of COVID-19 pandemic.

2.5. Future directions

Psychosocial competencies may act as protective, buffering, factor against risks engendered in the face of the COVID-19 pandemic. These competencies are interrelated in the way that fostering change in one competency may conjointly contribute to improve households, adults, and children's likelihood of resilience. Previous research has proposed that movement-based activity, such as sports, could act as a mediator to help individual develop such skills (e.g., developing interpersonal communication skills and self-assertion in a teamwork sport game). In the same line, it would be interesting to study how the participation to creativity-based activities could contribute to the development of other competencies. For instance, in adults, creativity-based interventions have been used, in art-therapy, as a mean to foster emotion regulation skills, reduced anxiety, and burnout, thereby promoting both mental and physical health functioning (Carroll, 2005; Darewych & Riedel Bowers, 2017; Pennebaker, 1997; Potash et al., 2014). Likewise, in early age children, creative activities such as dance, music, movement, or fantasy pretend play have shown promising results in terms of self-regulation and inhibitory functioning (Thibodeau et al., 2016; Williams & Berthelsen, 2019), social skills such as adjustment, cooperation, and emotional regulation (Greene & Sawilowsky, 2018; Nicolopoulou et al., 2015; Theodotou, 2017), or theory of mind and empathy (Goldstein & Lerner, 2017; Goodman & Dent, 2019). Thus, it is likely that creativity-based activities may serve the development of other psychosocial competencies, thereby contributing to fostering resilience-related outcomes.

While these previous research has addressed clinical or preschool settings, it would be valuable to address the extent to which creativity-based interventions can be a flexible and cost-effective tool that may be implemented at home, and in various ages. Indeed, while in lockdown, it would be worth studying how parents and children may improve their likelihood of resilient outcomes through tailored creativity-based activities. To be sure, we do not suggest that creative thinking skills are more important than other psychosocial competencies. Rather, we propose that, like sport, creativity-based interventions offer promising perspectives as about how research can foster adaptive outcomes in households, parents, and children in the face of COVID-19 related adversity.

Submission declaration

The authors acknowledged that this manuscript has not been published previously that it is not under consideration for publication elsewhere, that its present form is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder.

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Authors contributions

NBV and AU contributed equally to the full first draft of this manuscript. RS and KMK revised subsequent drafts and contributed additional references. All authors have approved the final manuscript.

CRediT authorship contribution statement

Nicolas B. Verger: Conceptualization, Writing - original draft, Writing - review & editing. **Agata Urbanowicz:** Conceptualization, Writing - original draft, Writing - review & editing. **Rebecca Shankland:**

Writing - review & editing, Supervision. **Kareena McAloney-Kocaman:** Writing - review & editing, Supervision.

Declaration of competing interest

The authors disclose no financial and personal relationships with other people or organizations that could inappropriately influence their work.

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