

USING MOBILE TECHNOLOGIES FOR SELF-REGULATION IN HIGH SCHOOL LEARNERS' STRESS MANAGEMENT

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ABSTRACT– This paper reflects on the experiences of a school psychologist who has encountered a visible increase in stress symptoms amongst adolescents due to the emerging demands of the modern world. We argue that students can be taught to use technologies and Apps to alleviate these stress symptoms, since the researcher cannot always be available as facilitator. Apps that make use of videos, music, nature sounds, and guided mindfulness meditation were initially practiced in a series of interviews with twelve stressed adolescents. They were then encouraged to use the tools and techniques before stressful situations and before sleep at night. Initially, due to levels of anxiety and activation, it was difficult for participants to apply these strategies alone but using technologies as the “mediating other”, in times when the researcher was not available, eventually helped redirect attention to somatic regulation and alleviated the need for the device altogether in some cases. Over time they reported increased well-being, reduced anxiety, and fewer stress symptoms as a result of these interventions.

Keywords: Stress, Apps, Mobile Devices, Technologies, Adolescents

1. INTRODUCTION: STRESS SYMPTOMS IN MODERN ADOLESCENTS

The digital era is characterized by a population that has become used to a wealth of information at the touch of a button. Other features of this modern world include shrinking distances between all people in the global community and the emergence of instant communication at all times of the day. Unfortunately, this incredible digital age has also come at a cost, as it has introduced a whole new dimension of stress (Kabat-Zinn, 2015). In the educational field, adolescents find that there are far greater expectations related to the need to develop 21st century skills in preparation for their future careers (National Research Council, 2013). Traditional pedagogies are questioned, and in some cases perpetuated, leaving questions as to their relevance in the modern world. Adolescents field a constant stream of instant communication via email, or mobile devices, as there are WhatsApp groups or other communication channels in order to keep up to date with every sport and school subject. Expectations and pressures thus invade their personal space at all hours of the day or night and the boundaries, of home or sleep or work, become blurred (Kabat-Zinn, 2015). Furthermore, Social media tools such as Instagram, Snapchat or Facebook encourage them to portray themselves as a perfect person in a perfect world. This can be used as a mask behind which they can hide on the one hand, and make them vulnerable to public exposure on the other. Both socially and personally, their online personas make them feel the need to live up to the profile they create (Van Der Kolk & McFarlane, 2012). The need for public affirmation increases as they obsessively seek *likes* and *followers*. They feel they need to be constantly *plugged in* to everyone on their mobile world. They therefore need to meet perceived expectations, to respond immediately to peers, teachers or coaches, and to juggle the emotional impact of being vulnerable on social media sites across several communities (O’Keeffe & Clarke-Pearson, 2011). Within this context, adolescents also face the reality of long, driven days, filled with demanding activities and obligations. This goes along with increased expectations from parents, pressure from coaches, and demands from teachers, as they are also now under the threat of global competition for university entrance and jobs. A personal fear of failure, and a sense of letting everyone down if they cannot meet these demands, seems to be a commonly recurring sentiment (Lenhart, Purcell, Smith & Zickuhr, 2010).

This paper reflects on the experiences of a school psychologist who has encountered a visible increase in stress symptoms amongst adolescents at a private boy’s high school in Johannesburg, as well as in her private practice. These stress symptoms include fatigue, lowered immunity, anxiety, panic, avoidant behaviour, sexual risk-taking, depression, and suicide (Niksirat, Sipasuwanchai, Ahmed,

Cheng & Ren, 2017; Sawyer, Afifi, Bearinger, Blakemore, Dick, Ezeh & Patton, 2012). In some cases, these stress symptoms include addictive behaviours such as substance abuse, pornography, and any other obsessive activities (e.g. exercise, or dieting). Social media addiction and excessive gaming are two more examples of more recent addictive behaviours linked to the use of technologies (De-Sola Gutiérrez, Rodríguez de Fonseca & Rubio, 2016). This has led to ambivalence and controversy, as parents and teachers often feel the use of the technology is addictive and unhealthy. Adolescents, on the other hand, feel that it is a coping mechanism - even a lifeline in many cases (Donker, Petrie, Proudfoot, Clarke, Birch & Christensen, 2013). Nonetheless, this notable increase in stress symptoms in adolescents remains a concern.

Physiologically, in the face of such perceived stress, the body tends to react with a state of chronic Autonomic (Sympathetic) Nervous System activation. This means that the system is in a constant state of fight/flight, or a heightened nervous system over-arousal, which adolescents experience as the norm (Kabat-Zinn, 2015). However, hope lies in the fact that practicing Mind-Body techniques of relaxation, or mindful awareness, engages the counterbalancing Parasympathetic Nervous System response allowing the body to “rest and digest”, repair, or replenish. Clinicians may find, though, that the adolescents experience meditative or relaxing states to be strange or even “uncomfortable” (Culbert, 2017). It must also be noted that models for adolescents to date appear to be mostly intuitive adaptations of those created for adults, and there is a considerable need to investigate this (Culbert, 2017).

2. TOOL MEDIATION: FROM CO-REGULATION TO SELF-REGULATION

Advances in neuroscience have introduced the notion that one can learn to approach emotional health and wellbeing by working with the Body as well as the Mind (Baer, 2006; Kabat-Zinn, 2005). Traditionally, psychological interventions are “top-down” focused, i.e. working with only the cognitive or rational mind (the neocortex, and emotions) and ignoring the body’s role in dealing with stress or trauma (Porges, 2003). Given these advances in neuroscience, a neuroscientist, Stephen Porges, developed the “Polyvagal Theory”, which in essence is a way to understand how human beings mediate stress or trauma through the engagement of the Brain’s Autonomic Parasympathetic System (Porges, 2003).

Psychiatrists and neuropsychologists began integrating their knowledge, and pioneers such as Bessel van der Kolk (2001) and Peter Levine (2005) posited that in order to lower stress levels and improve functioning or well-being, the individuals’ Autonomic Nervous System needs to be regulated first. Clinically speaking, this means taking a *bottom-up processing* approach to stress management, i.e. working from the Body to the Mind. Subsequent research suggests that Mind-Body skills such as visualization, mindfulness meditation, and regulation of breathing or other Autonomic Nervous System functions, can reduce the body’s stress response of Sympathetic (Fight or Flight) arousal, and even modify genes, immune function, anxiety, depression, and risk-taking behaviours (Levine, 2010; Van der Kolk, 2001). Unfortunately, in practice, adults or adolescents often do not sustain the use of these Mind-Body skills, despite being taught how to use them. They seem to lose focus, motivation, or interest, if there is no initial period of mediation or “co-regulation” (Culbert, 2017). To attempt to partially address this issue, we argue that we can draw on theoretical knowledge of concepts such as development, attachment, co-regulation (Poole-Heller, 2017), self-regulation, neurophysiology (Porges, 2003; Van der Kolk, 2001; Levine, 2010) and modulation through mobile technologies (Niksirat et al, 2017), to alleviate adolescent stress symptoms. Using Technology can positively motivate and engage the adolescents’ attention in a novel yet comfortable way (Culbert, 2017) whilst the school psychologist can assist adolescents in the development of Mind-Body skills by teaching them to source and use technologies including mobile devices and Apps. The individual can thus be invited to be involved in mediating their own stress levels, through practicing such skills (Schwartz, 2017). This process can include the teaching of mindfulness meditation, yoga-type breathing exercises, and somatic grounding exercises, but the weekly therapeutic contact cannot ensure the ongoing practice of these tools, which is necessary, if they are to be of benefit (Culbert, 2017). Support can be provided by the psychologist in formal sessions, while the technologies can be used daily at any time

they feel a need between sessions. Theoretically, it is suggested by the researchers that this is a mirroring of the early childhood developmental process whereby the baby uses external objects (e.g. pacifiers, soft toys) to psychologically transition from a place of maternal co-regulation of stress (e.g. separation anxiety) to a place of *Secure Attachment* (Badenoch, 2016; Poole-Heller, 2017).

Unfortunately, the human mediator (the educational psychologist) cannot always be around and on call for the rapidly increasing numbers of young people who seem to require consistent assistance and redirection on a day-to-day basis. Hence the idea to include technologies, as the mediating other, to take the place of the researcher when they are not available. As early as 1993 researchers were claiming that computers had the potential to mediate the very activities that define people's everyday lives – “how they learn, how they think, how they socialize” (Weizenbaum, 1993). A more contemporary view on this matter is that technology should rather support complex human, social and cultural interactions (Amiel & Reeves, 2008). We propose that by using technologies as the mediating artifact in place of the traditional therapist, we are able to address stress more effectively by mediating practice on a daily basis, which is seen as the way to derive maximum benefit from Mind-Body skills (Saltzman, 2014). Vygotsky (1986) proposes the human intervention of a more able peer in the scaffolding process, but we argue that the technology itself could fulfil this mediating role. Vygotsky had the view that individuals left on their own to construct knowledge for themselves (or help themselves as we are suggesting now) are unlikely to be stretching their intellectual capabilities. We have noted before that at the time when Vygotsky conceptualized these ideas there were no technologies like those available today that could replace the human mediating presence (Lautenbach & Batchelor, 2013). Zinchenko (1995) concurs that certain technologies can mediate as the tool, taking the place of the researcher in this case.

The aim of this study was thus to use technology to co-regulate adolescents' stress management practices in-between counselling sessions, by inviting them to personally be part of their own wellbeing and stress management. An additional aim was to make the therapeutic process more effective and enable the adolescents to develop valuable life skills for future choices and behaviours.

3. METHODOLOGY: EMERGING NARRATIVES

Within the South African private, traditional, school system, there is a multidisciplinary school-based support team (SBST), which may comprise the school nurse, the school psychologist, head of academics, learning support teachers and chaplains. Individual cases are raised within the SBST by concerned teachers and are then referred to the relevant professional. Adolescents may also self-refer. As the school psychologist I find that reasons for referral include personal or family stress, as well as school-related commitments, or social pressures. Illness, loss of a parent/sibling, or trauma, such as armed robberies or car accidents, are common. In a series of open addresses to parents and pupils by the head of academics, supported by the researcher, adolescents in grades eight, 11 and 12 from a single school were invited to work with the researcher in learning Mind-Body skills as part of their stress or trauma management. Fifteen participants voluntarily came forward and consented to take part in this research. Only twelve participants took part in the individual sessions which included a series of individual interviews over a period of two to three weeks where the researcher introduced them to the Mind-Body skills available to them as resources, or psychological tools, which they could use to self-regulate and restore balance and wellbeing in their lives (Culbert, 2017; Kabat-zinn, 2015). These initial interviews determined their particular stressors and needs, as well as the extent to which they were experiencing distress or symptoms, (which were given a name and a score out of ten), and accordingly, various Mind-Body techniques were taught and practiced. These techniques included Yoga-type breathing exercises, ANS regulation, postural and haptic system regulators, mindful awareness of their personal body, thoughts, feelings, and meditation (Gomes, 2014; Levine, 2008, 2010; Van der Kolk, 2001; George, Sackeim, Rush, Marangell, Nahas, Husain, Lisanby, Burt, Goldman Ballenger, 2000). In this research the applications (Apps) or tools that have been implemented thus far as resources have included mobile devices running personal health tracking Apps, (e.g. breathing apps or meditation, yoga, and sleep tracking apps) and Websites or YouTube videos using calming music, nature sounds, and guided mindfulness meditation exercises.

Once adolescents expressed an interest to do so, time was spent on discovering and trying out their preferred technologies and Apps. The adolescent would indicate a preference for technologies that they felt were more or less helpful in the moment. Breathing exercises were generally introduced first, then websites or APPS for sleep or mood tracking, mindfulness awareness exercises, music or meditation, and nature sounds (waterfalls, birdsong etc.) Adolescents were encouraged to practice these skills using the technological supports on a daily basis, while managing and being aware of their emotions, cognitions, sensations, or stress triggers. They were guided to use these tools before school to ground them for the day, and to apply these techniques before other stressful moments such as during moments of panic, or before tests, and sleep at night.

After implementing these Mind-Body techniques, participants were asked during a final interview whether they found the exercises helpful to their sleep, concentration and stress levels. These simple narrative interviews were held individually with the 12 participants and aimed at determining their experiences in-between sessions when they had to redirect or regulate themselves in times of stress. Interviews were transcribed and analyzed using simple coding techniques to reveal *narrative segments* that could add to the emerging narrative. Individual participant stories were therefore used to create the overarching narrative of the adolescent moving from co-regulation to self-regulation. Initial findings are revealed in the following section.

4. FINDINGS AND DISCUSSION

Participants report that due to levels of anxiety and activation it was difficult at first for them to learn to apply Mind-Body strategies by themselves (compare Kabat-Zinn, 2015; Culbert, 2017). They could not self-regulate as they were too activated and did not have the necessary tools to successfully lower stress levels. Fear and lack of control seemed to activate them further. All participants stated that the calm co-regulation of the researcher was essential in seeing that self-regulation was possible. Most of the participants were initially surprised at the introduction of technology as a mediating tool and were encouraged by the invitational nature of the interventions. There was, however, no real novelty effect in this intervention, possibly due the fact that technologies have already infiltrated almost every aspect of their lives.

On average, two to three sessions were necessary with each participant in a face-to-face format to introduce and practice Mind-Body skills with the researcher as mediator and to help them become more “present” and “embodied” (Schwartz, 2017). During this time technologies were also introduced as the mediating tool and practiced between sessions by the participants. In subsequent sessions, participants reported back on how they were able to use the Mind-Body techniques both with and without technologies. In cases where technologies were forbidden, like during assessments and other formal classroom settings, participants used the techniques without technologies. They reported that, with time and practice, using the Mind-Body skills on their own became easier. At first they needed the technologies to track, motivate and redirect their practice of these Mind-Body skills. Subsequently, they felt they were more able to integrate and apply these skills without the need for the external co-regulation provided by the researcher and the technologies. In other words, they seemed to progress to where they could self-regulate without needing the researcher or the technological tools (compare Handel, 2011). By using their embodied self to sense their moment-by-moment experiences of the “felt sense” (body sensations) (Levine, 2010), the adolescent learned to be aware of, tolerate and regulate their ANS response to their stress, and to thus feel better.

The clinical observations of the researcher and the narrative that emerged from the interviews suggest that technologies and associated Apps can be used as a kind of transitional object i.e. as a source of co-regulation, to significantly reduce stress levels in times when a mediating researcher cannot be there. It has emerged from the data that the visual or auditory stimulation, as well as the novelty and intrinsic motivation provided by the device, enabled stressed adolescents to redirect their attention to their somatic regulation (compare Schaaf, Benevides, Blanche, Brett-Green, Burke, Cohn, Koomar, Lane, Miller, May-Benson, Schoen, Parham & Reynolds, 2010), until they eventually learned to do this

without needing the device. In other words, this was a transition from co-regulation of their Autonomic Nervous System to self-regulation.

The adolescents who were referred with high levels of stress initially rated their stress by attributing a value out of 10. Most initially rated this stress as a seven or higher. Their symptoms at the outset of the process ranged from depression, anger, agitation, frustration, anxiety, to low energy, sleep, concentration and immune disturbances. Depending on the severity of the stress, and after between one to six sessions, most reported that they found the technologies to have been helpful in motivating them and helping them be present and aware. They claimed that they were able to regain a sense of control and wellbeing whilst experiencing the relief of their symptoms being reduced. Most reported that after using the technologies and practicing Mind-Body skills that they would rate their stress as between three and four out of 10.

In summary, the technologies seem to have acted as a suitable mediating tool in the developmental process of learning autonomic self-regulation. The mediating tools helped to motivate, redirect and refocus them externally, i.e. to co-regulate them. As they learned self-awareness, and the techniques to self-regulate more and more, they reported that the Mind-Body skills were easier to use and that they could also use them more appropriately, without the external device, and felt better across the full range of their symptoms.

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