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Exploring Stress Relief Methods and the Efficacy for the Houseless at Urban Settings

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Exploring Stress Relief Methods and the Efficacy for the Houseless at Urban Settings

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Abstract

When the word “stress” is mentioned to lay people, they might think that their definitions of “stress” would be the same or similar. However, stress may vary by, not only degrees of the adverse circumstances, but also kinds of stressors which make an individual’s experience of stress and their coping mechanisms complicated. Stress refers to a state of mental strain or tension resulting from adverse circumstances. Each individual living in society undergoes stress as a part of life. To some degree, stress keeps us motivated to stay alive in this way through survival instincts. However, excess stress may cause chaos for the system in which it affects. In order to lower risk of chronic health problems through the reduction of overall stress, stress relief methods can be deemed a valuable source of preventative health maintenance. This thesis begins by addressing the efficacy of common stress relief methods for general adult, healthy populations. Then, the focus will be pivoted towards houseless individuals living in urban settings in order to explore more efficient stress relief methods with consideration of accessibility from a financial, physical, and safety perspective. With completion of this stage of research, this thesis presents evidence that access to green space provided an effective and accessible method of relieving stress for houseless individuals in urban areas.

Introduction

People in current society have an understanding of stress that has been taught through years of personal experience and societal shaping. If one was encountered and asked to share their definition of stress, they might give you examples such as deadlines for work, marital issues, societal trauma, death of loved ones, not being able to find food, losing their home, etc.

People in urban areas experience stress that is unique to their situations when compared to those that live in suburban or rural areas where living cost and population density are not as high. For example, individuals living in urban areas may face higher risks of becoming houseless partly due to elevated housing costs in urban areas. Additionally, while living in urban areas creates greater pedestrian access to the resources that help them survive, urban pedestrians may also be exposed to higher levels of prejudice against their existence and the impact of that stress can last a lifetime. Thus, while stress, nevertheless, is variable but can be understood by nearly every adult in the world, houseless urban residents may suffer more from a particular intensity of stress that requires immediate remediation through societal development. Considering the time this will unfortunately require, how are houseless individuals expected to survive these intense stressors?

The difficulty with the ubiquity of stress in modern urban populations is that it suggests a positive correlation between increased stress and development of chronic illnesses. For the general population, “75% and 90% of primary care physician visits are caused by stress-related illnesses. Cardiovascular disease, obesity, diabetes, depression, anxiety, immune system suppression, headaches, back and neck pain, and sleep problems” are only a few of the chronic issues that have been known to arise from chronic stress (Jackson 2013). As mentioned above, stress has been known to wreak havoc on the immune system (Krantz, D., et al. 2013) which may lead to decreased health for the chronically stressed. With this correlation in mind, the opposite might suggest that reducing stress can decrease the likelihood of chronic disease. As they currently live, houseless people tend to suffer from chronic health issues at a higher rate than generally healthy, adult populations. With this greater risk of long-term effects from stress, addressing the impending issues among the houseless and working to create a system in which they, too, can live stable, healthy lives is imperative to the health of the houseless.

The experience of being a houseless person is uncomfortable. Instances that may be more common among houseless individuals might include lack of a safe shelter, lack of a generally healthy and clean environment, and inability to manage nutrition to the same degree that a housed adult would be able to. With these additional difficulties, degrees of stress that are experienced by houseless individuals are increased when compared to a general, healthy, house adult. More frequent and more severe episodes of stress, in turn, may increase the risk of acquiring chronic health issues that relate to the body's natural responses to stress, as explained below.

Stress and Its Physiological Impacts

Stress impacts nearly every system of the body in different ways. The brain experiences and adapts to stress in several serious ways. With atrophy and neurogenesis disorders of the hippocampus and amygdala, decreasing dendritic branches, decreasing numbers of neurons, altering of synaptic terminals, decreasing neurogenesis in the hippocampus, reduction in hippocampus volume, and modification of LTP, the brain experiences memory disorder and reduction of cognition (Yaribeygi, et. al., 2017).

In the immune system, release of hormones such as ACTH, growth hormone, and steroids, all which can be released through stress, can modulate the function of the immune system, and create an imbalance in the immune system (Yaribeygi, et. al., 2017). A more direct causation of stress induction includes an increase in plasma concentration of norepinephrine. Norepinephrine has an inverse relationship with immune function (Reiche, et. al., 2004).

The heart reacts to stimulation of the sympathetic nervous system with increases to heart rate, blood pressure, and vasodilation of arteries, amongst other effects (Herd, 1991). With the

increased activity of the heart, prolonged stress, such as constantly living in a lens of survival for houseless individuals, can severely shorten life spans and lead to increased rates of chronic heart problems. Chronic heart failure, myocardial infarction (heart attack), vascular changes, atrial fibrillation, angina, hypertension, among other chronic conditions, can arise from this chronic state of stress on a heart.

The gastrointestinal (GI) tract, the human's stress organ, has also been studied to be adversely affected by stress. Appetite modifying, GI tract movement, digestive functions, and GI system inflammation are all aspects of the effects of stress on the GI tract (Yaribeygi, et. al., 2017). Appetite modifying involves the ventral tegmental area and the amygdala. The impacts of stress can create anorexia for the stressed individual or cause a reduction in food or water intake (Ranjbaran er al, 2013). Effects of stress on CRH-2, CRH-1, and 5HT-3 receptors inspire disordered movement of the stomach and colon, preventing effective emptying (Monnikes et. al., 2001). Digestive functions, through stress affecting the parasympathetic nervous system, modifies absorption, permeability, and function of ion channels (Collins, 2001). Without being able to properly absorb nutrients that our body requires to function, our systems slowly begin to cease function. With activation of T lymphocytes and release of cytokines, GI system inflammation can induce illnesses such as irritable bowel syndrome or colitis (Yaribeygi, et. al., 2017).

The endocrine system, with reaches into many different parts of the human body, can also be heavily affected by stress in several complex and subtle ways. With impacts of many different organs and functions of the body, it has been suggested that "it is impossible to separate the response to stress from the functions of the endocrine system" with its many methods of communication and function modification (Yaribeygi, et. al., 2017).

Through the endocrine system, the body can function through the stimulation of stress to release cortisol. This release of cortisol has been a common method to evaluate for objective levels of stress relief in individuals. If the level of salivary cortisol in an individual's system has lowered, then they objectively have experienced reduced stress. On the other hand, a person's subjective experience of stress can affect the endocrine system, cardiac system, GI, brain, the list goes on. Subjectively, if an individual feels that they are meant to experience less stress, such as through the act of listening to calming music or going for a walk, then the body responds in the same way with the slowing of the heart rate, decreasing the respiration rate, and maybe even settling nausea. The important distinction and inclusion of both measures of subjective and objective data were noted to be pertinent when evaluating the common stress relief methods and studies conducted to evaluate their efficiency.

Common Stress Relief Methods

Stress reduction can be considered as a form of preventative care at its most accessible level. The accessibility of common stress relief methods can certainly be questioned for different types of healthy adults in urban areas. In places like the state of Oregon, for example, recreational cannabis use for stress relief is legal and commercialized. This accessibility allows greater chance of success of limiting cumulative stress in urban populations. However, this method cannot be so highly considered for houseless individuals due to stigma of drug use and addiction amongst this population as well as factors of cost that come with smoking or eating cannabis. With these conditions of accessibility in mind, what kind of stress relief is effective and accessible to urban populations, specifically communities of unhoused individuals, around the country?

Although it would be ideal to ultimately find ways to remove stressors, there are many

ways to reduce stress. Such methods might include going out for a walk, taking some deep breaths, getting some fresh air, drinking water, or taking some time to relax. Additional methods to cope with stress may include access to green spaces such as parks, the practice of mindfulness mediation, or consuming an alcoholic beverage, smoking, or utilizing cannabis which has been legalized in the state of Oregon recently. Subjective measures of stress relief, measures that reflect the study participant's experience of stress relief, can be potent indicators of what methods we will continue to use throughout our lifetimes; though, does the objective data, measures collected without the opinion of the study participant, agree on most of these methods as well?

Exercise has been recommended as a tool for stress relief by doctors and parents/guardians since we were children. Physical education is a staple in the schooling system of the United States in attempt to keep children healthy in all aspects, mental, emotional, and physical. As we grow older, exercise becomes more of a release from work or school as an opportunity to "blow off steam" through demanding physical activity. Research has shown "consistent findings that people report feeling calmer after a 20- to 30-minute bout of aerobic exercise, and the calming effect can last for several hours after exercise" (Jackson 2013). To further specify these findings, it was found that exercise of an aerobic nature, involving a break from the stressor, typically allows for a reduction in overall subjective feelings of stress from the participants (Breus 1998). Additionally, acute aerobic exercise has been studied to have significant effect on stabilizing blood pressure shortly after completion of physical activity (L.S. Pescatello 2001). This effect, if utilized consistently, has been shown to manage blood pressure on a chronic basis but does not have scientific evidence to support that stress is managed as well, despite blood pressure being one of many physiological markers of psychosocial stress.

Unfortunately, the method of exercising and utilizing the time to escape a stressor cannot create a permanent effect of stress relief. Exercise throughout the day can have a calming effect in the short term but the results may not long and may require additional methods to tackle more significant or chronic stressors.

In November 2014, the state of Oregon voted to pass Measure 91 into law and therefore legalized the use of recreational cannabis in the state (State of Oregon, 2014). With this, residents of Oregon were granted to ability to use and sell cannabis, as regulated by the state, without requiring a medical cannabis license. Cannabis has been prescribed medically in the past, and by some other states currently, to patients requiring pain management in attempt to avoid prescribing opiates (Alana 2019). With this, anecdotal evidence suggests that cannabis can also reduce acute, short-term psychosocial stress. This suggestion was tested in a 2017 study which demonstrated that a low dose of THC (7.5 mg) in a sample of 29 men and 13 women did lower feelings of stress and frustration during tasks (Van Hedger et. al., 2017) (Childs, 2017).

However, increased amounts of THC (12.5 mg) did not lead to decreased stress or frustration in short-term studies and actually led to more instances of increased stress. With this information, the use of cannabis for stress relief can be noted to be a fickle task requiring extensive knowledge of the substance and assistance to create a maximized experience. In attempt to improve this metric, use of cannabinoid oil (CBD) was suggested for feelings of acute psychosocial stress. However, a 2021 placebo-based experiment was utilized to determine true efficacy against psychosocial stress versus perceived efficacy in a sample of 43 healthy adults. Following completion of the study, CBD was associated with increased sedation but without objective data that the participants noticed reduced stress. Participants who believed in the effectiveness of CBD in reducing their stress noted significantly diminished anxiety (Spinella et.

al, 2021). With this study proving limited efficacy of the stress relief method, it would not be an efficient choice for the general population of healthy adults in the US.

Getting some fresh air, going for a walk, or taking a moment to get out into nature are a few of the commonly suggested methods when someone mentions that they are in need of a break. Green space has become an increasingly rare commodity through industrialization as the automobile has become the focus of outdoor spaces and therefore inspired the creation of "concrete jungles". Spaces like Central Park in New York have been conserved as green spaces in order to fulfill the instinctive human need to "get some fresh air" when acutely stressed. The science of this suggestion has been studied through measuring psychological and physiological measures of stress in order to investigate reactions to short-term visits to urban nature environments. The included environments were a city center, urban park, and urban woodland area. Overall, the study demonstrated that salivary cortisol levels decreased during short term exposure to green space in all different environments (Tyrväinen et. al., 2014). Additionally, stress was measured among 608 adults in Hong Kong, aged 20 years or older, through higher odds of moderate or poor sleep quality. Subjects that resided in neighborhoods with higher densities of green space often had citizens with better sleep quality and, therefore, reduced stress levels (Yang et. al., 2020). Through several different objective and subjective measures, including cortisol levels and sleep quality/melatonin levels, access to green space has been proven to be an effective stress relief method to alleviate stress levels.

Mindfulness meditation "primarily cultivates an ability to bring a nonjudgmental sustained awareness to the object of attention rather than cultivating focused awareness of a single object, such as a word or mantra, as occurs in concentrative meditation" (Kristeller, 2007). With this method of awareness and attention to oneself, many have believed that mindfulness

meditation can successfully decrease stress levels and inspire a more secure, calm presence about situation's that someone may be experiencing. As we do with seeking help for mental health from a professional counselor, mindfulness meditation has been thought to accomplish similar retrospection into one's mind through sustained awareness to the object of attention, their self. In a study completed with the goal in mind to reduce stress and limit healthcare expenditures for a business structure, mindfulness-based stress reduction was known to help a broad range of individuals to cope with clinical and nonclinical problems (Grossman et. al., 2004) and was investigated to determine "dosage" and how to efficiently incorporate it into corporate life (Klatt et. al., 2009). Through this study, they did determine that "dosing" mindfulness meditation into the workday during breaks, such as lunch, did demonstrate decreased stress levels subjectively and objectively through self-reported sleep quality and salivary cortisol levels. However, due to inconsistencies and methodological concerns of studies regarding different aspects of cognition and mindfulness-based interventions, Yakobi et. al. (2021) aimed to conduct a meta-analysis of studies focused on mindfulness-based interventions on attention, working-memory, and executive control. Through the meta-analysis, it was determined that mindfulness-based interventions do have limited positive effects on attention and executive control in healthy adults. However, it was unclear if the participants' motivation may have accounted for that effect and therefore it was concluded that further research was necessary. Ultimately, mindfulness meditation does seem to serve some utility from a subjective perspective, but objective proof of stress relief remains uncertain in recent studies.

With review of the efficacy for these methods, the effect that exercise, cannabis use, access to green space, and mindfulness meditation were determined to have ranging efficacies from "requiring more objective data" to objective, quantitative proof of stress relief for a general

adult population. However, high risk communities are not always able to access methods available to the general population. What may work for that sample may be much more difficult to obtain and especially difficult to practice regularly in attempt to relieve acute stress on a normal basis. This barrier may determine if stress relief is an achievable method of preventative care for populations such as houseless individuals, LGBTQ+ communities, and BIPOC communities.

Accessibility of Common Stress Relief Methods

Houseless populations face several challenges on a daily basis that regard their survival. Through attempts to find spaces in which to sleep, eat, bathe, or even to simply exist, houseless individuals are rarely in a state of security. This lack of security exemplifies survival stress at its core— "This automatic response developed in our ancient ancestors as a way to protect them from predators and other threats. Faced with danger, the body kicks into gear, flooding the body with hormones that elevate your heart rate, increase your blood pressure, boost your energy and prepare you to deal with the problem" (Krantz et. al., 2013). With this constant stress, their systems are at higher risk for dysfunction due to constant hyperactivity of their sympathetic nervous system. Stress relief does fit the picture to be a short-term aide while political society determines how to elevate individuals out of their houselessness. However, the methods listed above are not all as easy to access as it might be for a general healthy adult living in an urban area.

Exercise

In previous sections, exercise was reviewed through the lens of the general population to be effective in creating stress relief for short periods of time and therefore

can reduce periods of acute stress. With consideration of exercise as a method to reduce stress, a typical person living in an urban space might think of attendance in a gym or going for a run around their neighborhood. Each of these options would be likely to provide the recommended 20-30 minutes of aerobic exercise that has been proven to reduce acute stress levels. There are, however, barriers of access for these methods to houseless populations that are likely experiencing financial difficulties. A typical gym membership, through commercial gyms, can range between $10 to $100 a month (Zuckerman, 2021). On top of this, even the cheapest of clubs (e.g., Planet Fitness) at $10 a month requires an address to move forward through the membership process (Planet Fitness, 2022). With this barrier, the next best option for utilizing the method of short-term aerobic exercise would be engaging in a run in their neighborhood. For a houseless person with limited security of their belongings, who would watch their property if they were to leave on a jog? If this individual has a limited wardrobe, including only one pair of shoes, could a jog possibly lead to injury through wearing improper footwear, overheating, For the nearly 25% of houseless individuals that have a form of disability, how can they safely engage with a jog around their neighborhood (United States Interagency Council on Homelessness, 2018)? With this perspective, exercise as a form of stress relief cannot be considered as an accessible method for houseless individuals and may even be considered dangerous to those that are disabled.

Cannabis Use

Data previously discussed in this paper demonstrated that THC at low doses (7.5 mg) did allow for a decrease in subjective and objective levels of stress for a sample size of 42 adults (Van Hedger et. al., 2017) (Childs, 2017). However, financial, legal, and

dosing barriers remain for houseless populations when it comes to use of cannabis, even in states that have legalized recreational use such as Oregon. For example, a typical cheaper price for a pre-rolled joint can range from $3-5 with about 18% THC (Blooming Deals by Cannabis Nation, 2022). This amount of THC does equate to 0.09 grams of THC or 90 mg. To follow the suggestion of the above article, attempting to determine when an individual has consumed 7.5 mg of THC would be difficult to accurately measure. When, per the above study, just 5 more milligrams of THC can heighten negative feelings of stress, then utilizing cannabis for optimal stress relief can be determined inaccessible. Outside of dosing difficulties, a houseless individual experiencing financial difficulties may not be able to afford $3-5 for a single pre-rolled joint. However, if an individual required stress relief in a form of cannabis for other ailments such as chronic pain, $3-5 could be viewed from this perspective as relatively affordable. Finally, despite the recent legalization of recreational cannabis in Oregon, several potential employers still choose to test for drug use and include cannabis on their panel. This barrier may create hesitation in houseless individuals as they may want to limit causes for jobs to possibly turn them away; thus, effectively increasing the stress levels of houseless individuals by creating an unending cycle of requiring stress relief but being unable to effectively access it and progress in other aspects of life.

Access to Green Space

For houseless individuals, living in urban areas means that more resources within walking distance are available to them. Shelters, food pantries, free medical clinics or emergency rooms, and other resources are typically available within close range in urban areas. This implies that a houseless person could, in cases of able-bodied individuals, can

walk reasonable distances to these resources. However, living in urban areas such as these can possibly limit access to green spaces. Noted above, access to green space has been noted to be an effective stress relief method to alleviate short term stress levels through several different objective and subjective measures (Tyrväinen et. al., 2014) (Yang et. al., 2020). Allocation for green spaces in large urban areas such as Portland, through anecdotal evidence, has been proven to be desirable to the general population, as well as houseless individuals, as a place to spend time on a fair-weather day. With access to a public space that has been proven to decrease levels of stress, one barrier that can be noted is actual travel to the space. For a disable houseless person, walking with or without personal belongings can be a large barrier of access to green spaces. However, with methods of public transportation in Portland, such as the streetcar for a $2.50 pass or the MAX for a $5 day pass (or even $1.25-2.50 with an honored citizen pass) (TriMet, 2022), a disabled person with limited financial means may be able to access the space with greater probability of success than accessing a gym or a cannabis dispensary.

Mindfulness Meditation

Mindfulness meditation, as studied above, can be completed in short time periods (Klatt et. al., 2009) with subjective data that stress levels were reduced in general adult populations. However, the efficacy of this method does require further research due to the ambiguity of objective data regarding the effects of mindfulness meditation. Subjective data, though, does suggest that an individual may experience benefit from the method even without true, objective relief. This subjective perspective may be enough for some individuals to decrease overall acute psychosocial stress and therefore, hopefully, improve chronic health. With the main requirement being knowledge of how to meditate

and a space to utilize the method safely this method could be accessible to houseless populations that have access to shelters, food pantries, or clinics where this method could be taught and practiced safely for short periods of time. Though outside of these spaces, the question remains if the individual has a space through which to practice mindfulness often enough to reduce chronic stress safely. The nature of mindfulness meditation can be rather involved and requires focused concentration on a nonjudgmental sustained awareness to the object of attention. This focused attention could detract from attention to their surroundings leaving them vulnerable to environmental dangers without the safety of a house-like structure. For an individual that can be educated, or has prior education, of mindfulness meditation and also has access to a safe space to conduct meditation for short periods of time, then this method can be accessible to houseless individuals. Due to these stipulations, the accessibility of mindfulness meditation is noted to be mildly limited.

Conclusion

In the current state of our country, becoming houseless is far more likely to occur than it has been in the past given growing social inequality, precarious job market, and rising housing costs, especially in urban areas. This proximity to an unfortunate tragedy should inspire a vigorous fight to establish social systems to care for individuals that do experience this systemic failure. With policy changes through the hands of democracy, hopefully systematic changes may be on the horizon and housing structures may become available for the large populations of the United States that are currently houseless. However, this long-term goal unfortunately does nothing to support houseless individuals in their daily existence. The stress that houseless individuals endure every day to survive ravages their systems with chronic effects to the

immune, GI, cardiac, and endocrine without any sign of respite. To suggest stress relief methods that might work best for the general population of houseless individuals may be the bare minimum, but it is a factor that they can control in a world where so many factors are outside of their control.

With methods of stress relief mentioned above such as exercise, cannabis use, access to green space, and mindfulness meditation, research has shown that, for the general adult population of the world, these methods can be selectively effective. Exercise has proven to work for short bursts, working to reduce acute stress with a distraction that can otherwise improve your overall health even without the factor of reducing stress. Cannabis use has strict guidelines towards what can be deemed effective for reducing stress with common avenues of obtaining cannabis providing far more in single doses than is required, in terms of stress reduction. Access to green space was proven on multiple subjective and objective measures to reduce stress in adults of the general population. Mindfulness meditation also demonstrated subjective relief in stress for general, healthy adults even in short doses for improvement in attention and executive control.

However, houseless individuals do face barriers that many of the general adult population may not have to worry about. This thesis attempted to identify which of these methods was determined to be the most effective for those that might face physical, financial, or safety barriers to achieving stress relief. Through studies of each of these methods and evaluation of how barriers might affect access, green space availability in urban areas demonstrated ability to provide the safest, most affordable, and least physically demanding of all the discussed methods of stress relief.

When considering accessible methods of stress relief for an individual that could possibly be facing several barriers of physical, financial, and safety origins, access to green space offers an effective method of stress relief. Access to green spaces, such as public parks, can be utilized for stress relief in several parts of an urban city without financial investment from the houseless, extensive physical toll (as one might find through exercise), or risk to safety considering all of their belongings can be brought along with them and public, large spaces offer multiple eyes which can deter physical harm. Following this study, further research should be conducted in the form of a survey to ask houseless people of an urban population for additional methods that they feel provide relief from stress, other than the methods reviewed in this study. Additionally, with further time and resources, a survey study that determines to what extent each stress relief method effectively improves the well-being of the houseless for a long-term period would be beneficial in continuing investigation initiated here.

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