

WONDERFEELZ HUMMING WALKING AND COGNITIVE WALKING – MULTIPLE TASK WALKING CONCEPT AND CASE REPORT OF ENGINEERING EMPLOYEE

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ABSTRACT

Stress is handled by variety of ways. Dual Task walking is also one such measure but the concept requires more clarity. Operational Definition of Dual Task Walking, Multiple Task Walking are proposed. Humming walking, Cognitive Walking and Cognitively Controlled walking techniques are clarified operationally. A variant of Multiple Task Walking systematized by current author is also outlined along with a case report of an engineering employee.

Keywords: Dual Task Walking, Multiple Task Walking, Humming Walking, Cognitive Walking, Cognitively Controlled-Walking.

I. INTRODUCTION

Walkable Is Talkable:

'Walk', is one of the most critical aspects of mobility and is important in order to maintain a healthy lifestyle and a good quality of life (Shumway-Cook A et al, 2002). Walking is a common activity and a known health measure. But it is not routinely practiced and so among even clinicians (Rethorn, Z D. et.al, 2022). Many have inconsistent motivation probably because walking exercises as health measure are usually done as a separate activity other than the routine. In a 12 week follow up it helped to reduce Stress Score on DASS although not the Anxiety and Depression scores (Koziel, Nicole et.al., 2022). Long-term brisk walking efficiently improves BMD, that a 30 minutes brisk walk per day 3 or more times per week (volume>16) is recommended to prevent bone loss in premenopausal women (Lan, Yong-Sheng and Feng, Yu-Juan 2022). Adults who walk less had worse mental and physical health compared to those who walked the same or more. Reductions in walking are negatively associated with mental and physical health (Levi Bonnell et.al 2022) Improvement is reported of cognitive functions as significantly related to the number of walking sessions attended by participants with schizophrenia (Mandini, S et.al 2022).

Need to invest on Dual Task Walking:

Not walking alone (single task) is popular but its variants too.

Variants of walking are not only limited to Nordic walking (Jana Jurikova., and Jan Kyzlink, 2020) and dog walking (Christian H et.al, 2018), but often dual task walking is tried.

Walking is often tried in dual task walking mode also. In general, dual task walking seems to be better than walking alone. Taking gait as important factor in walking and mobility, it is specially considered in people with disabilities. Physical exercises and specifically dual task walking have good effect on central nervous system.

Physical activities including football and basketball exercises comprised of aerobic, anaerobic, endurance balance-coordination and sport-specific training seem to be helping much (Tolga Saka et.al 2019). Apart from physical activities, dual task walking practice helps stroke patients to some extent if not very significantly (Plummer, Prudence and Iyigün, Gözde 2018)

Increased cognitive demands lead to heightened HbO₂ levels in dual-task walking. White matter microstructural Integrity (WMI) can alter the effect of dual tasking on PFC HbO₂. Poorer WMI was associated with a larger increase in PFC. Results by (Lucas, Melanie et al 2019) suggested that compromised WMI is the underlying mechanism for inefficient brain response to cognitive demands when walking as added additionally.

There is evidence suggesting that aortic stiffness may serve as a modifiable target for the prevention of poor cerebral white matter microstructural integrity (Wei, J.2019). While arterial stiffness is influencing axon degeneration rather than demyelination, controlling arterial stiffness may help WM axons in the aging brain (Badji, Atef et.al 2019).

Greater deep WMH volumes are associated with slower walking speed under dual-task conditions, and this relationship is mediated in part by global cognition and executive abilities specifically (Ghanavati T et.al 2018). Dual-task training programs influence wide range of cognitive aspects from attentional skills to inhibitory control or mental set-shifting abilities and the reduction of dual-task costs (Wollesen, Bettina et al 2020).

Cautious gait studied shows suppression in alpha/mu (8-12Hz) and beta (13-30Hz) rhythms (Malcolm, B R et al, 2018). Thus, in dual task walking greater cognitive efforts are invested. Though dual task walking gives some benefits, the enhanced efforts and cautiousness can also lead to stress.

Therefore, investing on dual task walking and its variants is probably a promising intervention if done systematically and professionally by psychologists. The role of psychologists is crucial for administering dual task as effectiveness is influenced by nature of cognitive task and intricate neuropsychological are at play on the other hand.

Psychologists and Walking:

Richardson D P et.al (2022) discusses about cognitive control of gait differing between over-ground and treadmill walking as well as underlying adaptive measures essential to maintain behavioral performance at increasing task demands. Thus, the psychological aspects involved in dual task walking are not just apparent one and involves many intricacies to be dealt with by qualified psychologists.

Factors that decide relationship between gait variability and psychological domains involved are having multiple dimensions and higher cognitive demands (Sunderaraman Pet al 2019; Killane, Isabelle et.al, 2013).

The psycho-biological background of the individuals causes much variability in what will happen and should not be handled in mass or pre-set module-based approach if clients should be served ethically. Individualized approach typical of psychologists is inevitable.

Some studies support the role of personality in determining gait (Stephan, Yannick, et.al 2017). Gait is also influenced by whether the individual views their own physical aging in terms of physical losses or ongoing psychological development (Blawert, Anne et.al 2021).

Establishing Conceptual Clarity:

Kang, S.-J., Kim, B.-H., Lee, H., and Wang, J (2021) recently tried, a dual task walking variant called Cognitive Walking Programme, though two of the three components (Cardio Respiratory Walking and Dual-Task Walking) of their Cognitive Walking Programme were non – cognitive in nature but included under “Cognitive Walking” programme, leading to lack of conceptual clarity within their methodology.

In literatures also another conceptual clarity is lacking, that if a walk combined with a cognitive task is parallel or the walk itself is cognitively controlled, i.e., Cognitive Walk Vs Cognitively Controlled Walk. For example, if the Subject counts numbers as per instruction and also walks as per instruction it is Cognitive walking, instead, if instructed to count but keep the step only at counting specific number and avoid at counting other numbers then it is Cognitively Controlled Walking. In case of former, cognitive task and walking are parallel and not governing or controlling each other by instruction (methodology), while in case of latter, the walking task is under the control of a cognitive task by instruction (methodology).

Here therefore there is need for defining operationally and differentiate conceptual variations.

Operationally defining:

Current author is defining operationally three interrelated concepts of 1) Dual Task Walking, 2) Cognitive Walking and 3) Cognitively Controlled Walking.

1. **Dual Task Walking** is operationally defined as “a method of doing two tasks together of which one is walking as mandatory”.

2. **Cognitive Walk** is operationally defined as “Either a dual task walking or multiple task walking of which one cognitive task predefined by experimenter is executed by the Subject while simultaneously walking but neither the selected cognitive task nor the specified walking is under the control of each other according to the instructions from experimenter”

3. **Cognitively Controlled Walking** is operationally defined as “Either dual task walking or multiple task walking of which, walking is essentially controlled by one cognitive task predefined by experimenter being executed by the Subject while walking according to the instructions from experimenter”.

The Dual – Task walking is of such a nature that can be administered or researched by any non-Psychologist professional, but Cognitive Walking and Cognitively Controlled Walking are sole domains of qualified psychologists, for the unique and quality contributions of specialization.

Measures and methodologies should also be differentiated and clarified in methodologies by the researchers for better quality research.

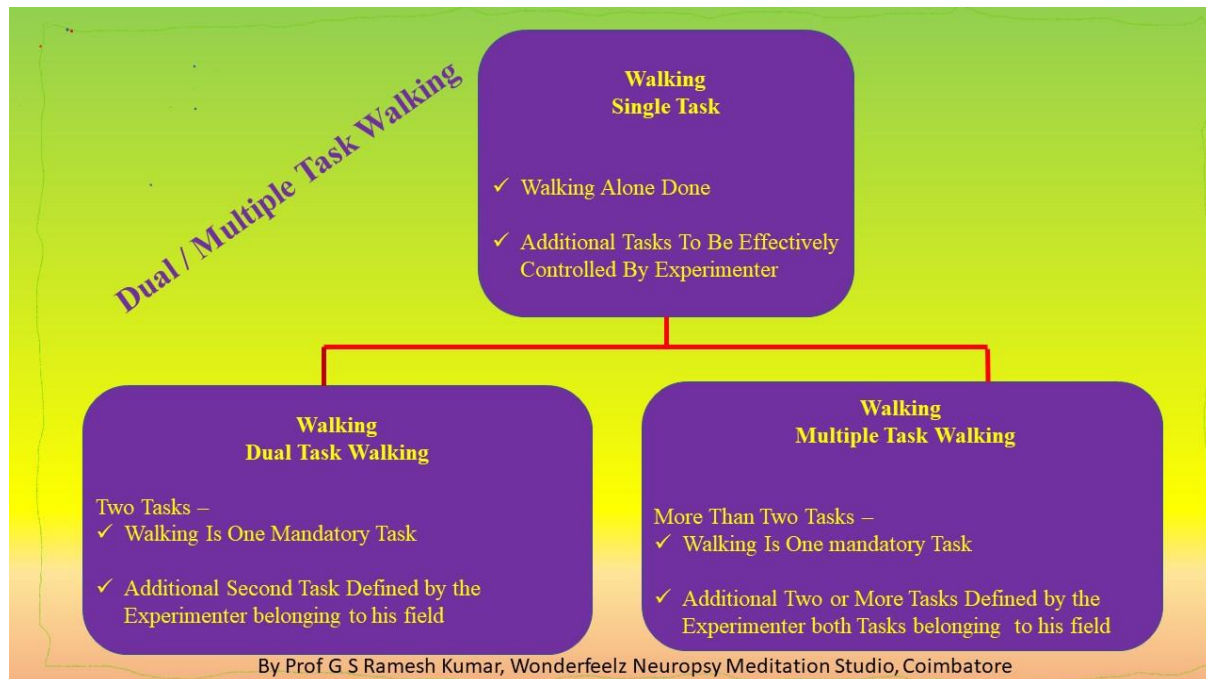


Figure 1: Dual Task / Multiple Task Flow Chart

In this article the current author has systematized the dual task walking variant, that seems to be helpful.

In line with above operational definitions, the method outlined by current author is Cognitive walking and not Cognitively Controlled Walking.

Wonderfeelz Cognitive Walking:

Current author systematized a variant of Cognitive Walking (Wonderfeelz Cognitive Walking).

The beginning of the procedure involves a Sankalp as it is the preparation stage in the Wonderfeelz Neuropsychy Power Meditation, a procedure systematized by the current author (Ramesh Kumar G S, 2022).

Sankalp is a stage following case history taking. In the Sankalp stage, the subject who wants to undergo Wonderfeelz Cognitive Walking takes a clear picture about the benefits he should attain or the purpose for which he takes up. The current method is individualized and cannot be trained in groups. The fullest power of individual differences is given a room to operate.

Wonderfeelz Cognitive Walking is trained in two stages:

First one is 'Humming Walking' stage.

Humming walking is a preparatory stage for Cognitive Walking. Wonderfeelz Humming Walking is a Multiple Task walking and neither Cognitive Walking nor Cognitively Controlled Walking. In this stage the individual is trained to exhale first. Abdominal breathing exercise is the only breathing exercise where expiration is done first followed by inspiration (Subin Solomen and Pravin Aaron, 2015) and usually inhalation is first done by others. As the subject exhales he is trained to feel the core feel. Core Feel is differentiated by current author from affect in his paper on Wonderfeelz Neuropsychy Power meditation (Ramesh Kumar G S 2022).

The individual at the end of exhalation, is instructed to take the turn smoothly towards inhalation and just leave his control, allowing natural capacity of the lung to operate by inhaling as much the lung requires (a natural inhalation as against voluntary, human decided inhalation limit). The underlying rationale is that amount of inhalation required is known only to body and not human intellect and that there should never be any 'imposition' on human system.

If the individual controls his inhalation, then he “self-assumes” how much it should be depending on the intricate psychobiological dynamic of body requirement and his subjective perception / neurotic illusion. ‘Self-assuming’ is a form imposition according to the Meditation system developed by the current author.

The second exhalation to be accompanied by humming through nose and not vocal cord and feel the core feel (not the breathing as others does). Thus, the current method is Multiple Task walking (not dual task) as it would involve 1) Controlled breathing, 2) feeling the core feel and 3) walking. The body language of the Subject is observed and introspection report is repeatedly collected by the psychologist and fine-tuned.

On first day, the target set as the Subject understands the concept and method, not in terms of number of trials as the purpose of the whole procedure implemented is to attain some predefined benefits.

On second session, the Subject is trained to hum while walking. The cycle is formed as controlled breathing, vocal humming and both occurring during walking.

Psychologist trains to the fine-tuned level of smooth occurrence and progress is monitored. Progress monitored are in terms of, the perfection in practicing the procedure by the Subject, the subjective indicators of physical and mental wellbeing collected by differentiating closely related benefits but that may not have occurred in case of that specific individual, and progress toward specific goal. The reported benefits are noted down and checked realistically.

The goal selected could be physical wellbeing, mental wellbeing, energy level or free thinking ability etc. but need to be defined measurably (therefore better to be done by qualified psychologists)

The controlled breathing, feel the core feel, followed by vocal humming – all while walking to be trained and prescribed to each subject individually for practice, in line with conceptual validity.

Second Stage: Cognitive Walking

This is trained only after the first stage of Wonderfeelz Humming Walking is done as prescribed. Wonderfeelz Cognitive Walking is usually on the third day / session, if the Subject is trained at expected level.

Wonderfeelz Cognitive Walking is again a Multiple Task Walking in which the individual feels the core feel, feeling the relaxation spreading through body and mind, both doing while walking.

Obtained benefits and improvements (that are still improving) are noted and checked realistically as done earlier and therefore need to be done by qualified psychologists. The controlled breathing, feel the core feel, followed by vocal humming – all while walking to be trained and prescribed to each subject individually for practice, in line with conceptual validity.

A Case Report:

Mr. PJ is a 21 years old Engineering graduate. He is employed in an Engineering Manufacturing Industry as Trainee. He is eldest of two siblings and her younger brother is a college student. Both parents of hers are employed in a factory as workers.

His boss came to know about the service through internet and enquired for his employee as PJ has impressed his boss as very polite and talented. PJ showed willingness for humming walking phase of Wonderfeelz Cognitive Walking. He had opted for Cognitive Walking phase on a later date. When enquired he mentioned the very decision of preferring only for Wonderfeelz Humming Walking phase is due to his planned visit to a distant place in couple of days.

He appeared curious and rapport could easily be established. Though he mentioned that he had some stress related symptoms, he was not particular about initiating counselling or therapy sessions. This hesitation for initiating counselling or psychotherapy is quite prevalent in his society. On enquiry, he had mentioned that his recent problem is worry due to a feeling of low adjustment with the organization, work, and related uncertainty.

The general symptoms found were:

Frequent thoughts about being in wrong job and what job he could try for or what job would he match. His usual start of the problems would be these thoughts followed by feeling of uncertain and an arousal that he must do something and urgently, adding only to already felt distress. Though his boss discussed with him and gave him some advises, that ‘did not stay much in his mind’ according to PJ. At finding increasing of his distress,

he would resort to talking with neighbours or listening to music or browsing over mobile internet / social media. He has difficulty to concentrate in his job.

On first session, he told that though such things were present earlier, his distress became strong for the past one month and, he felt a further increase for the last one week. His idea regarding solution was that once he got 'matching job' he would become alright. His idea about Wonderfeelz Humming Walking was that, as he thought a simple solution would be sufficient for his and it was not mere walking but something systematic, it would help him.

Before starting his session, Brief Symptom Rating Scale (5 items) (Lee, Ming-Been et.al, 2003) and Somatic Symptom Scale – 8 (Gierk, Benjamin 2014) were administered.

On first session Experimenter demonstrated the Breathing of exhaling first and then inhaling and asked him to do once. Subsequently he demonstrated the inhaling where it is allowed to occur naturally (involuntarily) rather than voluntarily. He required 9 times and each time there was fine-tuning effort needed. Once he learned it then he was coached to feel the core feel. This required 12 times to be done by him and after collecting feedback fine-tuned by the experimenter. For each trial on this, he was allowed to do for about 15 seconds on his own as instructed / corrected by experimenter. After each trial of 15 seconds the experimenter collected his feedback using only one pair of open-ended question each time, that, "What did you try to do? and what actually happened?".

Role of the experimenter was to qualitatively analyze the answer by him each time and correct / coach him. For coaching / correcting he adopted principles of psychology as applicable in each statement at every discrete instance, and that he implemented the current method's concepts. He answered his doubts only in accordance with both psychological principles as applicable and the concept of the current method (current method shares some concepts with his meditation system outlined in earlier paper).

The first session lasted up to 35 minutes apart from case history taking. He suggested PJ to practice at home on rest of the day and according to her time availability. This freedom is also given for, enquiry about time utilization at home, would help to infer about his motivation to change.

On second session after a gap of one day due to his other personal works, the experimenter enquired about his practicing at home but cautiously he avoided enquiring about the symptoms.

On this session, he coached PJ to feel the core feel and checked for his satisfaction from his replies. Following this he coached him to hum vocally but keeping the mouth closed. He insisted on his minimum efforts as straining one's human system (body and mind) for any purported benefit is discouraged. The second day session took 30 minutes and was suggested to practice every day at home. Experimenter took efforts to probe and ensure that he did Multiple Task Walking variety and Wonderfeelz Humming Walking variant was implemented.

After a gap of one day, again he fixed appointment to visit and this time post-session assessment of, BSRS and Somatic Symptom, was done. After a few days he stopped practicing at home also and when called him for a follow up it was 12 days since he had stopped practicing (as she mentioned). The raw scores of both pre and two post assessments are given in the table below:

II. METHODOLOGY

Independent Variable: Humming Walking Phase of Wonderfeelz Cognitive Walking

Dependent Variables:

- 1) BSRS – 5 Score,
- 2) BSRS – 5 Suicidal Idea Score and
- 3) Somatic Symptom Scale Score

Design: ABA1A2

III. RESULTS

Table 1: Raw Data of Humming Walking Phase

	BSRS – 5	BSRS – 5 Sui Idea	Somatic Symptom Scale
Before	14 Points scored (10-14 : Your emotional distress makes you uncomfortable and it is recommended that you should seek professional advice)	4 Points scored (More than 2 points please check professional advice)	20 Points scored (Very High 16 – 32 Points)
After	2 Points Scored (0-5Your physical and mental fitness is in good condition)	0 Points scored	10 Points scored (Medium 8 – 11 Points)
After 12 days of stopping practicing	1 Points Scored (0-5Your physical and mental fitness is in good condition)	0 Points scored	6 Points scored (Low 4 – 7 Points)

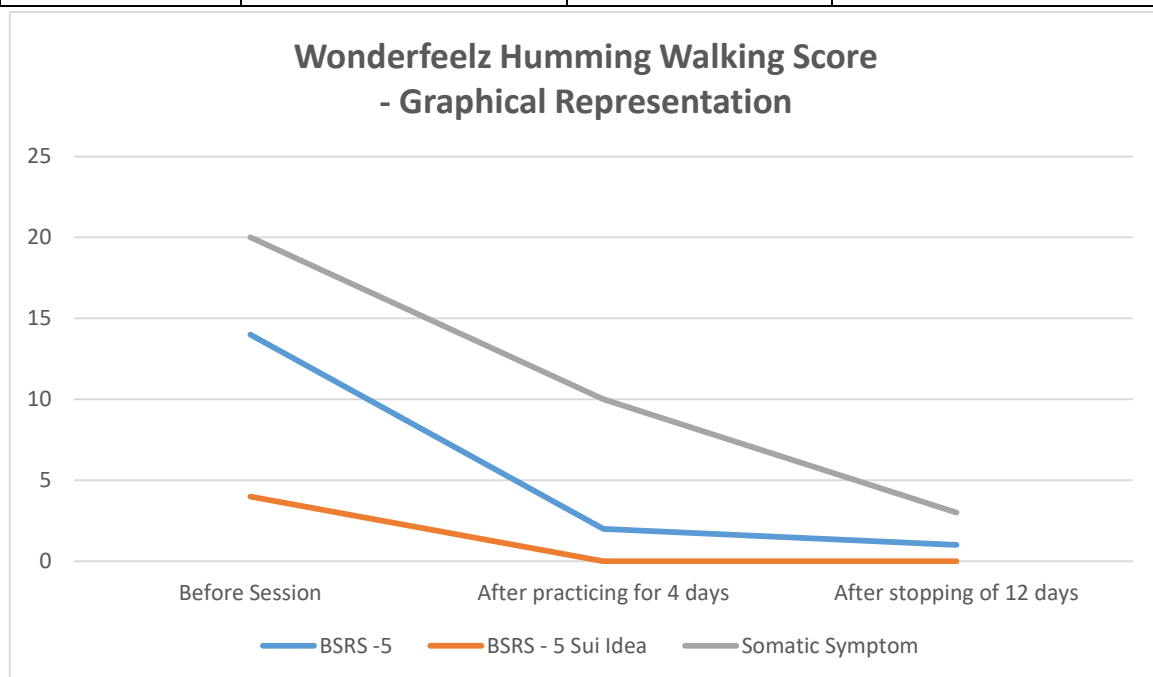


Figure 2: Graphical Representation of Scores Obtained

IV. DISCUSSION

As the Subject was trained, his task performance in everyday life was improved, such an improvement after the intervention was already reported (Evans J J et.al 2009; Uros Marusic., Joe Verghese., and Jeannette R. Mahoney, 2018). The coaching based on psychological principles and concepts of the current method helped much for him to improve and such coaching will differ from person to person and within session from instance to instance. Therefore, the efforts by psychologist can not be condensed in the name of “objectivity”. During such processes it can be well realized even by experienced psychologists that how individualized each response of each person at each instance and that making the study of individual differences more objective will add up only practical demerits (due to intricate nature of human learning and responses).

In the experiment, the subject tended to walk slowly and such a slow walk in this particular case was not due to his personality or due to Mobility-related fatigue or problems with strengths as reported in certain conditions (Minna Mänty, 2012). In the current system therefore, slow walking is neither a demerit nor given priority, since, in the current method the individual alignment at every new micro instance is valued.

In this experiment, there was also no indication of the animalistic nature of preferring locomotor mechanics that minimize metabolic cost (Donelan, Maxwell., Kram, Rodger., and Kuo, Arthus D., 2001)

When mental and emotional factors such as fear, grief, anxiety or depression drive breathing regulation, homeostatic and biomechanical functions of breathing can be disturbed (Rosalba Courtney, 2009). In the current case also, there was breathing regulation was not proper as mentioned during first session, but subsequently improved. Relatedly, his measured scores were also indicating lessened stress.

Anxiety increases the respiratory rate and can cause muscle tension in both the ventilatory pump and other skeletal muscles, so further increasing the work of breathing and respiratory demand (Spathis, Anna et.al, 2017). But in the current system this principle is minimum operating, as the current system itself is discouraging self-straining for whatever good purpose on one hand and becoming self-conscious as a condition.

The in-lab measures of gait do not accurately reflect daily-living gait measures. This is noted for in-lab usual-walking and also for in-lab dual-task walking (Hillel, I, et al. 2019). But on enquiry he informed that the speed during session under supervision of the psychologist and at his home were almost similar.

In a study it was observed that Walking at a self-selected (usual) pace was associated with an average speed of 1.31 m/s, a cadence of 116.65 steps/ min, and an oxygen consumption of 11.97 mL/kg/min, meeting/exceeding public health thresholds for moderate intensity activity (Elaine M. Murtagh et.al 2021). But this norm is also not closely related in any way to the current case. His speed when assessed only once unobtrusively was around 1 meter per 7 seconds. Cadence and oxygen consumption were not given importance in the current case but may be considered in future.

The measure involved in this method are qualitative and inferential. Hence the 'bent of mind' of the trainer is important variable in the success of the procedure. It is inevitable that a qualified psychologist is the choicest.

In the present single case report, there is a reduction in Dependent Variables of 1) BSRS 5 score, 2) BSRS 5 Suicidal Idea Score and 3) Somatic Symptom Score.

The obtained score are found to be maintained till 12 days of stopping to practice Wonderfeelz Humming Walking procedure, after having practiced for 7 days.

As it is the initial stage and single case report, the results can be understood better by professionals through inferencing and comparing with their observations in the past.

V. CONCLUSION

Operational definitions and conceptual clarity are suggested for 1) Dual task walking, 2) Cognitive Walking and 3) Cognitively Controlled walking.

A new variant of walking, Wonderfeelz Cognitive Walking is outlined that contains two phases Wonderfeelz Humming Walking and Cognitive Walking. Wonderfeelz Humming Walking phase and Cognitive Walking phase are Multiple Task Walking modes as against Dual Task walking that has been discussed so far in literatures.

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The obtained scores are found to be maintained till 12 days of stopping to practice Wonderfeelz Humming Walking procedure, after having practiced for 7 days.

Present case indicates that Humming Walking phase of the Wonderfeelz Cognitive Walking is useful in reducing stress specifically as measured by BSRS and Somatic Symptom Scale, in less than a week's time. However, individual differences are given highest value.

Wonderfeelz Humming Walking and Cognitive Walking phases are very different from usual Dual Task walking techniques.

VI. LIMITATIONS OF THE STUDY

It is a single case report and no much statistics used. It is in the initial stage and more experiments required Of two phases, the current paper gives a case report for only one phase. The current paper strongly advocates for individual approach, intricacies of mind and qualitative analyses rather than quantification, statistics and making things objective rigorously against nature of human system.

VII. FUTURE DIRECTIONS

The paper gives differential definitions of Dual Task Walking, Cognitive Walking and Cognitively Controlled walking.

Psychologists who wish to study further on related concepts, better adopt this differentiation for conceptual clarity.

More single case researches needed on the topic.

The authors can acknowledge professor, friend or family member who help in research work in this section.

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