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An abbreviated title: Morningness-Eveningness and TCI

### Abstract

**Objective:** The aim of this study was to examine the association between circadian types, temperament, and character.

**Methods:** We analyze the data obtained from a total of 2910 students who undertook the Temperament and Character Inventory (TCI) and the Composite Scale of Morningness-Eveningness (CSM). According to the CSM score, the circadian types were classified as the morning type (MT), neither type (NT), and the evening type (ET); four of temperament and three of character types of TCI scores were compared accordingly. We also conducted a correlation analysis between CSM scores and the TCI dimension, as well as a multiple regression analysis.

**Results:** When comparing the TCI dimension according to the circadian types after correcting for age and gender, the ET presented high levels of novelty seeking (NS,  $F=25.5$ ,  $p<0.001$ ) and harm avoidance (HA,  $F=58.112$ ,  $p<0.001$ ), whilst the MT presented a high level of persistence (PS,  $F=656$ ,  $p<0.001$ ), self-directedness (SD,  $98.559$ ,  $p<0.001$ ) and cooperativeness (CO,  $F=32.538$ ,  $p<0.001$ ). There were no significant inter-group differences regarding RD and self-transcendence (ST). From the results of the correlation analysis, if the subjects were more morningness, they presented higher values of NS and HA but lower values of PS, SD, CO and ST. From the multiple regression analysis with corrections for age and gender, it was presented that PS, NS, HA and ST had significant effects on CSM scores (adjusted  $R^2=0.146$ ,  $df=6$ ,  $p<0.001$ ).

**Conclusion:** It was determined that the MT was associated with a high level of PS, whereas the ET was associated with high levels of NS and HA.

**Key Words:** Morningness-eveningness, Circadian typology, Chronotype, Temperament, Character

### PT742

Histamine N-methyltransferase is important for the normal sleep-wake cycles and aggression through the regulation of brain histamine concentration.

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### Abstract

Brain histamine regulates the important physiological functions including sleep-wake cycles acting as a neurotransmitter. Although neurotransmitter concentration in the synaptic clefts is strictly regulated by the clearance systems, the mechanisms of histamine clearance remained almost unclear. Our previous studies have demonstrated that histamine N-methyltransferase (HNMT), a histamine-metabolizing enzyme, was important for histamine clearance *in vitro*. Thus, in order to clarify the importance of HNMT *in vivo*, we analyzed HNMT deficient mice in this study.

First, we revealed that the histamine content in the brain lysate of HNMT KO was 6 times as abundant as that of WT, confirming that HNMT was essential for histamine clearance in the brain. Next, most of Hnmt KO was wounded in home cages, suggesting the high aggression in Hnmt KO. We confirmed the high aggressive behaviors of Hnmt KO in the resident-intruder test and aggressive biting behaviors test. The aggressive behaviors of Hnmt KO in the resident-intruder test were significantly decreased by the pretreatment with a H2 antagonist zolantidine but not with a H1 antagonist pyrilamine, indicating that excessive H2 activation led to the high aggressive behaviors. In addition, the locomotor activities significantly decreased in Hnmt

KO. Because histamine is known to be the key molecule for the wakefulness, we suggested that abnormal histamine concentration disrupted the sleep-wake cycles leading to the decrease of locomotor activity. The sleep analysis has elucidated that a prolonged waking time of KO in light period with extended sleep time in dark period, implying that high brain histamine induced by Hnmt deficiency prolonged the wakefulness in light period. These results indicated that Hnmt might contribute to the regulation of aggression and sleep-wake cycles in mice through the maintaining of the histamine concentration and histaminergic neuronal activities.

### PT743

Mental Health status of Correctional Officers in Correctional Institutions

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### Abstract

**Objectives:** The purpose of this study is to measure the current levels of mental health statuses of correctional officers using various instruments. The result of the study could help establish appropriate solutions and policies for the officers.

**Methods:** Subjects were 2571 correctional officers from 50 correctional facilities in South Korea. They were asked to answer or rate their occupational experiences with using diverse inventories and scales such as Maslach Burnout Inventory (MBI), Korean Occupational Stress Scale (KOSS), The Job Satisfaction Scale by Davison and Cooper, The Korean version of Beck Depression Inventory (K-BDI), and Rosenberg's Self-Esteem Scale (RSE). We also gathered additional data with working conditions and treatment.

**Results:** The burnout score of the correctional officer was higher than that of the other occupations based on Maslach Burnout Inventory (MBI). Using the Korean Occupational Stress Scale (KOSS), the averaged occupational stress of the correctional officer was higher than that of the other occupations. The average score of job satisfaction was lower than that of the other occupations. The average depression level of the correctional officer was 9.36 using the Korean version of Beck Depression Inventory (K-BDI). The level of self-esteem was lower than that of the other occupations based on Rosenberg's Self-Esteem Scale (RSE). In addition to the five different evaluations, the mental health status of male officers was worse than female officers. Meanwhile, we noticed that they already understood the state of their working environment and the employment treatment was worse than the other occupations.

**Conclusion:** This research shows the mental health status of the correctional officer is worse than the other occupations. This finding emphasizes the need for a system to regularly assess mental health states of the officers and solutions for improvements.

**Key Words:** Correctional institution · Correctional officers · Mental health · South Korea.

### PT744

The study of facilitating factors of suicide and strategies for suicide prevention in Korean military executive members

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**Abstract**

**Objective:** This study researched prevalence rates of depression and suicide-related behaviors, targeting military executives, and tried to figure out suicide-related attitude and level of awareness. Moreover, this study suggested factors required for military-specialized psychological autopsy, and sought for construction plan about suicide prevention system for military executives.

**Methods:** This study conducted literature search, online-survey, case analysis of military suicide, and psychological autopsy suggestion. In literature search, references evaluating effect of military suicide prevention strategy were searched in the systemic review. 3,289 references were found, and 9 references were finally selected. Research targets were all of military executives belong to 3 military infantry divisions and 1 air-force fighter wing, and data of 3,339 out of 4,796 were used. The research contents were as follows; depression(CES-D), suicide ideation/plan/attempt, psychological treatment, anxiety(HDAS), problematic alcohol use(ASSIST-Lite), negative daily life incidents.

**Results:** The result of prevalence rate of depression/suicide risk showed that current prevalence rate of depression was 3.7%, and of serious suicide ideation was 3.2%, and of concrete suicide plan was 0.4%, and of suicide attempt was 0.1%. 'Solitary life', 'Experienced help of psychologist', 'Anxiety/depression', and 'Experienced various personal relationship problems' were brought up as risk factors related to suicide behavior, and 'The attitude of low-acceptability toward suicide'. CES-D 3-questions and conflict with colleagues in a recent month were investigated to screen suicide plan/attempt within a recent month, and the result showed AUC 88%, sensitivity 89%, and specificity 86%. Finally, this study suggests two versions of military-specialized suicide psychological autopsy.

**Conclusions:** This study figures out facilitating factors about increasing suicide prevalence rate of military executives, and at the same time, it suggests an executive suicide prevention program which consists of 5 areas-Make all executives gate-keeper, Secure mental health professional resources, Perform mental health screening test on commanders, Run mental health healing camp, and Provide suicide prevention programs.

**PT745**

Targeting the dopamine 1 receptor or its downstream signalling by inhibiting phosphodiesterase-1 improves cognitive performance

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**Abstract**

Insufficient prefrontal dopamine 1 receptor (D1R) signalling has been linked to cognitive dysfunction in several psychiatric conditions. Since the phosphodiesterase-1 (PDE1) is postulated to regulate D1R-dependent signal transduction, the study intends to elucidate the role of PDE1 for cognitive processes reliant on D1R function.

Pro-cognitive effects of the D1R agonist, SKF38393, were studied in the rat 5-Choice Serial Reaction Time Task (5CSRTT).

Mechanistic studies on modulation of neuronal transmission by SKF38393 were performed using extracellular recordings from rat prefrontal slices. D1R-PDE1 double-immunohistochemistry was performed using human and rat brain sections. Potency of the PDE1-inhibitor (PDE-I: WO2013/192556) was determined in assays using recombinant human PDE1A, 1B and 1C expressed in a baculoviral system. PDE-I was administered to mice and the increase of cAMP/cGMP was determined in prefrontal tissue via ELISA. Effects of PDE1-I on working memory performance were tested in the mouse T-maze continuous alternation task.

SKF38393 improves attention in the 5CSRTT and increases synaptic transmission in the prefrontal cortex. Double immunohistochemistry revealed PDE1-D1R co-localization cortical structures. PDE-I proves to be a potent PDE1A, 1B, 1C inhibitor ( $IC_{50} = 31-75$  pM), and PDE-I administration results in a dose-dependent increase of cAMP/cGMP in the prefrontal cortex and reversed MK-801 induced working memory impairments in the mouse T-maze task.

The data support the link between PDE1 and D1R, suggest that PDE1 regulates D1R signalling by modulating cAMP levels, highlights the role of this pathway in cognitive processes, and support the use of PDE1 inhibitors as a potential approach for the treatment of cognitive dysfunction.

**PT746**

The Effect of Mindfulness Meditation Programs on Perceived Stress and Quality of Life of Mental Health Professionals: A Pilot Study

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**Abstract**

**Objectives:** This study aimed to evaluate the effect of mindfulness-based stress reduction(MBSR) program on perceived stress and quality of life of mental health professionals.

**Methods:** Subjects were 20 mental health professionals(nurses, social workers and mental health assistants) who work at the mental hospital and randomly assigned the meditation group (N=10) and control group (N=10). The meditation group participated in MBSR sessions for 120 minutes a week during 8 weeks and daily practice at home, and control group didn't received any program. Data were collected using WHO Quality of Life-BREF (WHOQOL-BREF), Korean version of Five Facet Mindfulness Questionnaire (K-FFMQ), Korean version of Warwick-Edinburgh Mental Well-being Scale (K-WEMWBS), Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI) and The Stress Response Inventory (SRI) at the beginning and end of MBSR program.

**Results:** After the practice of the MBSR program, the meditation group showed a significant difference in WHOQOL-BREF, K-FFMQ, K-WEMWBS, STAI and SRI scores. However, there was no significant difference in the control group.

**Conclusion:** These findings suggest that MBSR program can improve the quality of life, mental well-being, mindfulness level and perceived stress of mental health professionals.

**Key Words:** MBSR, Mindfulness, Meditation, Quality of life, Stress