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## FIVE-YEAR TRANSITIONS OF SYMPTOM SUBTYPES IN UNTREATED OBSTRUCTIVE SLEEP APNEA

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**Introduction:** Symptom subtypes have been consistently identified in mild and moderate-severe OSA in cross-sectional studies. The objectives of this study were to determine how often participants transition between symptom subtypes over 5 years and whether baseline clinical factors were associated with observed transitions.

**Materials and Methods:** We analyzed demographic, clinical, polysomnographic and symptom data from 2,643 participants of the Sleep Heart Health Study (53.7% women; mean age 62.4 years) with complete baseline and follow-up visits (5.2 years between visits). Latent transition analysis was conducted using 14 daytime and nighttime symptom items in individuals with OSA diagnosis (apnea-hypopnea index [AHI]≥5) to determine symptom subtypes at baseline and follow-up as well as their transition probabilities over time. Individuals without OSA (AHI<5) were incorporated as a known class at each time point. Multinomial logistic regression was conducted to assess the effect of age and sex on class transitions between baseline and follow-up visits.

**Results:** We identified four OSA symptom subtypes at both baseline and follow-up visits: minimally symptomatic, disturbed sleep, moderately sleepy and excessively sleepy. Most participants did not transition subtypes between visits (55.8%). Of participants whose subtype remained the same between visits, 54.1% had minimal symptoms at baseline; 48.5% were in moderately sleepy; 31.5% were excessively sleepy and 34.6% were in disturbed sleep. A transition to moderately sleepy was the most common. Excessively sleepy participants transitioned most often to moderately sleepy (37.9%). One-year increase in baseline age was associated with a 7% increase in odds to transition from excessively sleepy to disturbed sleep (OR=1.07; 95%CI=1.01-1.15) and about 6% increase in odds to transit from excessively sleepy to moderately sleepy (OR=1.06 (95% CI=1.02-1.12)). Women had higher odds to transit from moderately sleepy to minimal symptoms (OR=2.35; 95%CI: 1.27-3.27) and to transit from minimal symptoms to no longer having an OSA diagnosis (OR = 2.30; 95%CI=1.40-3.80).

**Conclusions:** Approximately half of the participants transitioned their symptom subtypes over a period of 5 years, with most transitioning to minimal symptoms. Increasing age and sex may affect the transitions.

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## IMPACT OF SLEEP DURATION ON THE RESPONSE TO VACCINATION: A META-ANALYSIS

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**Introduction:** The SARS-COV-2 pandemic has resulted in over than 5 millions confirmed deaths. Although vaccination is a major strategy to control this pandemic, to date, only 54% of the world population has received at least one dose of a COVID-19 vaccine. Booster inoculations are increasingly recommended. Thus, the vaccination effort may need to continue for several years before the epidemic can be considered as contained. Although antibody response is just one facet of the adaptive immune system's response to vaccination, it is considered to be a clinically significant biomarker of protection. The role of insufficient sleep duration in individual differences in antibody responses to vaccination against influenza or hepatitis has been examined in a number of studies, with somewhat mixed results. In order to summarize and clarify these findings, we have used a meta-analytical approach to determine whether the current body of evidence suggests that optimizing sleep duration may be an

easily modifiable behavior that could increase the efficacy of anti-viral vaccination.

**Materials and Methods:** The PubMed database was searched with the combination “sleep\*” and “vaccin\*” keywords. Studies were selected if they met the following criteria: (1) were performed on healthy human adults; (2) assessed vaccine efficacy by antibody titers or protection status; (3) performed subjective (survey items, questionnaire, sleep diary, interview) and/or objective (actigraphy, polysomnography) measures of sleep duration; (4) were laboratory-conducted studies of manipulation of sleep duration over 1 or more nights; (5) were cohort studies; (6) were peer reviewed original research papers. Since the number of available studies was small, we have engaged in a collaborative effort with the authors of all publications to obtain the information needed to optimize the estimation of the pooled effect size (ES) and the 95% confidence intervals: log transformed data when non parametric testing was used; calculation of separate ES for men and women; analyses corrected for age and overweight/obesity status whenever appropriate; sleep data no more than one week apart from inoculation. Number of participants, mean, beta or odd ratio and their respective dispersion were collected. The ES was interpreted as small when ≤0.20, moderate when >0.50 - ≤ 0.80 or large when >0.80.

**Results:** No relationship was observed between self-reported short sleep and vaccine efficacy (n=504; overall ES=0.16 [-0.12, 0.44]). In contrast, when studies that used objective measures of sleep were examined, a robust adverse impact of short sleep on vaccine efficacy was detected (n=282; overall ES=0.96 [0.15, 1.78]). The pooled ES for experimental studies (n=111) was 0.84 [0.20, 1.49] and 1.08 [0.10, 2.06] for prospective studies (n=171). The meta-analysis did not find significant differences in ES between women and men.

**Conclusions:** When assessed objectively, short sleep duration was associated with a clinically relevant decrease in efficacy of anti-viral vaccination. These findings suggest that achieving adequate amount of sleep during the time window surrounding the time of inoculation may increase the efficacy of vaccines against diverse strains of viruses, possibly including strains of SARS-CoV-2.

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## LATENT PROFILE ANALYSIS WITH MMPI-2 RESPONSES IN MILITARY RECRUITS REFERRED FOR PSYCHIATRIC SYMPTOMS IN KOREA

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**Introduction:** Since South Korea has adopted the conscription system, medical and psychiatric evaluation is essential before military enlistment. The purpose of this study was to examine young men based on various symptoms in clinical dimensions of MMPI-2 who were referred due to psychiatric screening failure.

**Materials and Methods:** Subjects were 92 males aged 18 to 28 years who visited the psychiatry department of the university hospital for psychiatric evaluation. Of the total 92 subjects, 52 had depressive disorders, 29 had anxiety disorders, and 11 had other psychiatric disorders. Latent profile analysis (LPA) of MMPI-2 clinical scales was conducted to examine types and characters of latent class groups with clinically useful profiles among the subjects.

**Results:** The most frequent complaint was sleep disturbance. Three latent classes, ‘mild maladjustment group (MM)’, ‘neurotic depression and anxiety group (NDA)’, and ‘hypersensitive and hypervigilant group (HH)’ were identified. Each group differed in their clinical characteristics. The MM (15.2%) showed low scores of around 50 on all of MMPI-2 clinical scales. The NDA (39.1%) presented a clinically high score distribution in internalizing problems such as depression, anxiety, helplessness, social discomfort, and so on. Compared to the NDA, the HH (45.7%) complained of internalizing problems more strongly and at the same time, experienced a high level of paranoid idea, anger, and hostility.

**Conclusions:** This study suggests that classifying the military recruits with psychological maladjustment into three subgroups based on clinical