Sleep hygiene impacts on episodic memories in young and older adults during quarantine by Covid-19: preliminary results

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INTRODUCTION

Sleep benefits off-line consolidation of recent acquired information[1]. Insufficient sleep impairs health, especially key components of cognition, resulting in poorer attention and impaired long-term memory[2]. Currently, due to quarantine by Covid-19, sleep routines and sleep quality were modified and affected throughout the population. Preliminary results from our lab showed that episodic memory formation was impaired by emotional variables, such as anxiety and depression[3]. Furthermore, sleep hygiene is fundamental to improve sleep habits. Sleep hygiene refers to a set of practices and environmental factors that are related to good sleep quality[4]. Here, we perform a sleep hygiene treatment to study its impact on episodic memories and on emotional variables such as anxiety and depression in young and older adults during quarantine by Covid-19.

METHODS

Participants

- ✓Subjects: 25 young adults (20-40 years old) and 22 older adults (60-90 years old) without previous neurological or psychiatric disorders.
- ✓Tests and questionnaires: Beck Depression inventory – II (BDI-II)[5] State- Trait Anxiety Inventory (STAI)[6], Pittsburgh Sleep Quality Index (PSQI)[7] and the Morningness - Eveningness Questionnaire (MEQ)[8]. Furthermore, older adults were tested with a brief neurocognitive screening, including The Signoret Mnesic efficiency battery (BEM 144)[9] and Digits subtest (WAIS IV)[10].
- ✓Young and Old participants were divided in two groups: Sleep Hygiene Treatment and No Sleep Hygiene Treatment

- Memory change: Correct responses at testing – Correct responses at training
- Memory change ratio: Memory change 1 / Memory change 2

Basic Online Protocol

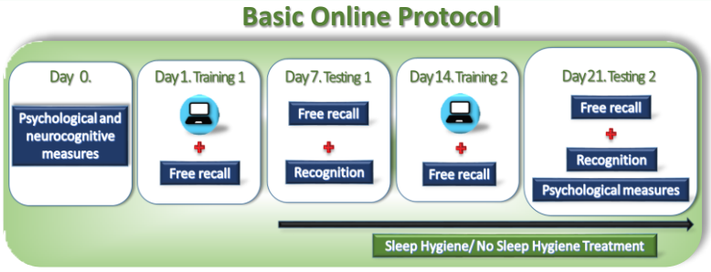


Fig.1: Experimental design

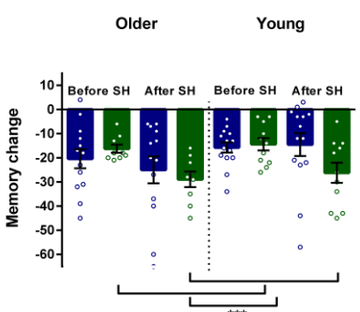
TEST	Older - SH	Older - NSH
IM	10.4±0.3	10.8±0.2
DM	9.7±0.4	9.4±0.3
SL	8.7±0.4	9.6±0.1
SM	7.08±0.4	9.22±0.3
Recognition	10.8±0.1	10.9±0.2
Digits	10.7±0.3	10.8±0.5

GROUPS	EDUCATION	AGE
Older- SH	15±0.8	68.5±2.3
Older - NSH	14.0±1.0	65.3±1.5
Young - SH	14.6±0.6	27.0±1.4
Young - NSH	12.3±0.4	26.7±1.5

SH stands for Sleep Hygiene group
NSH stands for No Sleep Hygiene group

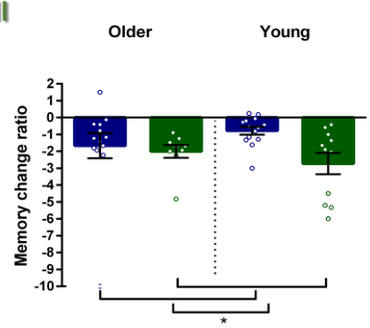
RESULTS

Free recall



The No Sleep Hygiene Treatment groups showed higher memory loss between day 14 and 21 than between day 1 and 7.

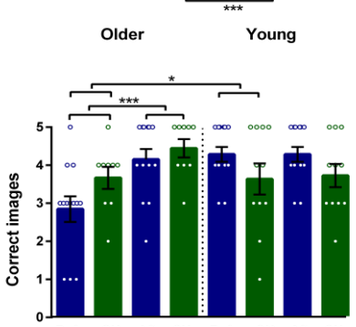
The increase in memory loss at day 21 is explained by an increase in source monitoring error. This effect is reduced in Sleep Hygiene groups.



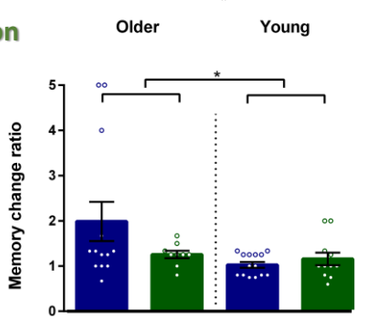
Young and older adults that received the Sleep Hygiene Treatment had a positive impact on free recall.

Sleep Hygiene Treatment
No Sleep Hygiene Treatment

Recognition

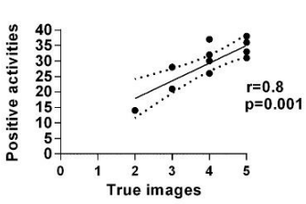


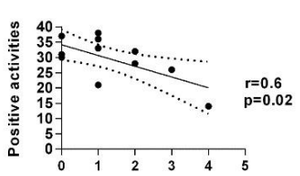
Young adults showed better memory recognition before Sleep Hygiene Treatment than older adults. Older adults increased memory recognition at day 21 independently of the Sleep Hygiene Treatment.



Older adults had better performance in memory recognition than young adults at day 21, independently of the Sleep Hygiene Treatment.

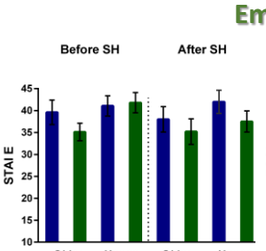
Correlation with hygiene activities

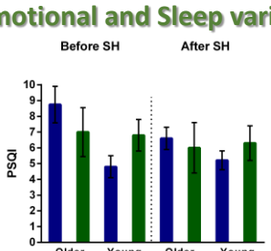


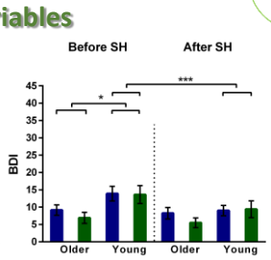


Older adults that received the Sleep Hygiene Treatment showed a positive correlation between the total amount of Sleep Hygiene activities and the amount of correct image recognition, and a negative correlation with false image recognition at day 21.

Emotional and Sleep variables







There was no significant differences between groups on STAI and PSQI test.

Young adults had higher scores on BDI test than older adults before treatment.
Young adults had lower scores on BDI test at day 21 compared to day 1, independently of the Sleep Hygiene Treatment.

CONCLUSIONS

Sleep hygiene can be an effective tool for both young and older adults to improve memory consolidation, however one-week treatment is not enough to induce emotional improvements.

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