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# A Survey about Nap Habits in Workplace

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**Abstract:** Sleep problems are becoming more common for many people. Napping during the day is one of the best ways to relieve the accumulation of drowsiness. Some companies have begun to pay attention to employees' health and encourage them to take a nap at noon. However, people have different opinions regarding naps. Many people refuse to take a nap because of the uncomfortable posture and the feeling after waking up. Also, facilities for people to lie down and sleep have not been popularized. The most common napping position is sitting. This study aims to let people nap better in a sitting posture in an office environment to avoid problems like shoulder and neck pain, nausea, and poor blood circulation during napping.

**Keywords:** *Nap, Sitting posture, Workplace, Sleep pressure*

## 1. INTRODUCTION

### 1.1 Nighttime sleep is not enough

A bedding manufacturer's survey conducted on 10,000 people across Japan has revealed that 49.3% of respondents are most likely suffering from insomnia. Many in their thirties and forties answered that they do not get enough sleep. It can be said that the insomnia tendency is increasing in Japan [1]. Sleep problem is becoming a serious issue not only in Japan, but the world. Sleepiness is an unavoidable consequence of shift work and irregular work hours severely increases the risk for accidents and mistakes. One countermeasure against sleepiness might be to allow naps during work hours.

### 1.2 Naps as a counter-measure to sleepiness

Japan is a country with a 'hard-work' tradition. People can often be seen napping in public places, despite the notice that 'no napping is allowed' written next to them. As stated by Dinges [2] sleeping on trams during commute times has become a common phenomenon. The sleepiness in daytime will influence work efficiency. Napping is a cross-cultural phenomenon which occurs across the lifespan of humans. People vary widely in the frequency in which they nap as well as the improvements in alertness and well-being experienced.

Napping is a common form of biphasic sleep, usually performed between 9am to 9pm as an aid to the usual nighttime sleep period. Some considerable evidence has been offered to support the conclusion that napping is an adaptive option, reflecting a chronobiologically regulated

sleep tendency that is amplified by sleep pressure and gated by environmental opportunity [3]. Vern Baxter, et al. [4] identified at least two variants: break-time napping and worktime napping. Each variant represents a different degree of management oversight and reflects the varying autonomy of the employee.

### 1.3 Nap sleep inertia

Sleep inertia refers to the effects of sleep on performance and mood immediately upon awakening from deep sleep. During awakening from sleep, especially abrupt awakening from deep sleep, there usually is a period of transient but very profound confusion, disorientation, and impairment of performance [2]. A major reason why many people nap is to enhance mood and/or performance, either by increasing activation after a nap, or by extending activation into the later evening to attenuate or delay the circadian decline in alertness. Performance enhancement may not always be apparent shortly after a daytime nap, but it can be evident many hours later, especially if prolonged wakefulness follows the nap.

## 2. METHODOLOGY

### 2.1 ESS (Epworth Sleepiness Scale)

Epworth Sleepiness Scale (ESS), as introduced at ESS website, "is a questionnaire made by Dr Johns to assess 'daytime sleepiness'. Respondents are asked to rate, on a 4-point scale (0-3), their usual chances of dozing off or falling asleep while engaged in eight

different activities. Most people engage in those activities at least occasionally, although not necessarily every day. The ESS score (the sum of 8 item scores, 0–3) can range from 0 to 24. The higher the ESS score, the higher that person’s average sleep propensity in daily life (ASP), or their ‘daytime sleepiness’. The questionnaire takes no more than 2 or 3 minutes to answer. Gender and age have little effect on ESS scores among adults” [5].

The reference range of ‘normal’ ESS scores is zero to 10. ESS scores of 11-24 represent increasing levels of ‘excessive daytime sleepiness’ (EDS).

### 2.2 Survey instrument

An online survey was conducted using wenjuanxing (www.wjx.cn), a web-based survey company. A questionnaire was developed to examine several key topics related to daytime nap in office environment. The main topics addressed were as follows:

- Overall nap habits during week
- Day time sleepiness level, based on ESS (Epworth Sleepiness Scale)
- Nap posture and physical discomfort
- Nap environment

The survey was performed in December 2019. Fully completed surveys were received for 51 respondents (male 25, female 26) from China. (However, online surveys, by their nature, result in the exclusion of individuals without Internet access.)

## 3. RESULTS

### 3.1 Overall nap habits during week

Respondents were asked: “Do you have a nap habit? If not why”, “when is the sleepest time?”, “when do you take a nap?” and “How long do you nap?”

About 73% of respondents have a nap habit during lunch break. Within the respondents who do not nap, just 11.76% of people thought nap is of no use. 47% of people did not nap because of some objective reasons, such as “no time” or “no comfortable space”. 66.7% of the people feel sleepy during 12pm to 3pm every weekdays and 55%of people would take a nap at 12pm to 1pm. For the last question, as shown in Figure 1 41% of people always nap for 20min to 40min, 28.2% of people do nap for not exceed 20min.

### 3.2 Day time sleepiness

Respondents were asked: “How likely are you doze off in the following situations?” based on ESS to measure how sleepy during the day. The final response rate (i.e., total completed divided by total eligible, or 51/51) was 100%. ESS score breakdowns for the respondents are

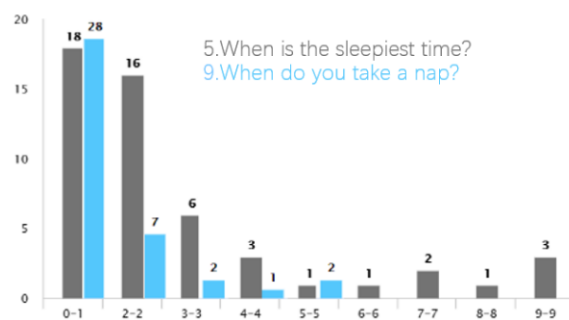


Figure 1: “When is the sleepest time?” is the black bar and “when do you take a nap?” is the blue bar.

presented in Table 1. The proportion of overly sleepy people is 37.3%.

Table 1: Results of ESS Score

ESS Score	People	Sleepiness Type
0-5	12 (23.5%)	Normal
6-10	20 (39.2%)	
11-12	9 (17.6%)	Excessive
13-15	6 (11.8%)	Daytime
16-24	4 (7.8%)	Sleepiness (EDS)

We used cross analysis compared the ESS score and nap duration (Figure 2). The results show high score respondents are who do not nap (26.3%) or nap duration above 30min (42.1%). Respondents who nap for above 30min were still feel sleepy. That means the nap did not release their fatigue. It may cause by sleep inertia. Even though most of the respondents will take a nap during lunch time, there still have 42% of people feel sleepy.

### 3.3 Nap posture

For 85% of respondents there have no space for them to lie down and sleep. 55% of them only can nap on the table with an uncomfortable posture. Sleeping on the

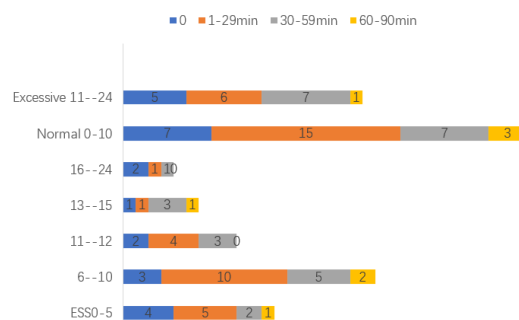
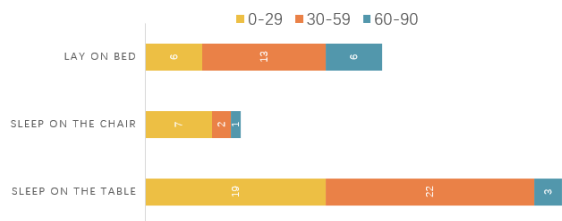


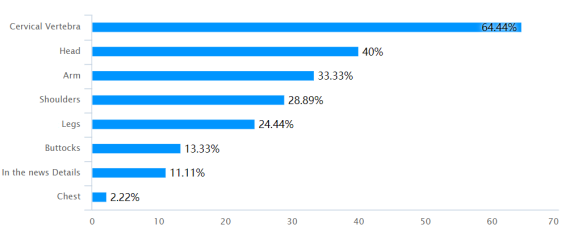
Figure 2: The relationship between daytime sleepiness and nap duration.

table is the most common way. 22.5% of respondents lean back in the chairs. The relationship between nap posture and nap duration. Respondents who nap with a sitting posture are difficult to sleep above 1 hour. A half of them were sleep above half an hour with a sitting posture (Figure 3).



**Figure 3:** The relationship between nap posture and nap duration.

As presented in Figure 4, for the people who nap on the table, 60% of them nap not were sleep for 30min–60min. Regarding the physical discomfort due to posture, 64.44% of people answered that the most painful part on their body was neck (or cervical vertebra), around 40% of people feel pain in their head. Arm, shoulders, legs are next.



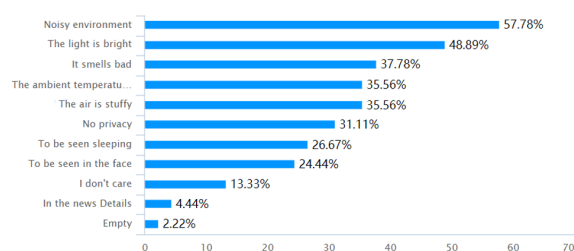
**Figure 4:** The answer to “Where do you feel pain while napping?”, multiple choice.

### 3.31 Nap environment

For the nap environment Figure 5, the top two most concerned are noisy 57.78% and bright light 48.89%. Then smells (37.78%), temperature (35.56%) and privacy (35.56%) were above 30%. 26.7% care about being seen in the face during a nap. About expecting nap environment. The top three people wants to experience were “not tired after waking up” (60.8%), “comfortable posture” (56.5%) and “fast fall asleep” (45.65%). When asked “what kind of sleep experience you want” figure, the first three are not tired after waking up (60.9%), comfortable posture (56.5%), fast falling asleep (45.7%).

### 3.32 Nap tools

The question: “Have you used some items to improve your nap? How is the effect?”. Only 28.9% of



**Figure 5:** The answer to “What problems do you care about while napping?”, multiple choice.

respondents have used. Some of this people expressed that pillow and earplugs work a bit. Eye mask is useful. And three respondents think blanket is very helpful.

## 4. CONCLUSIONS

This survey examined public opinion regarding nap habit in workspace. The survey yielded usable responses from 51 persons 25–40 years old.

The main findings were as follows:

- The majority of respondents agree that napping is useful and they take a nap regularly during the lunch break. Overall people who sleep more than an hour during daytime are few.
- Half of respondents sleep for more than 30min and are influenced by sleep inertia.
- The majority of respondents expressed a desire to have a single room where they could lie down and have a power nap. However, most of respondents have no space to lie down and sleep in the office. Most of them nap on a table.
- People have varying degrees of neck pain and headaches. The pain may not be caused by the nap, but the nap posture aggravates the pain in those areas.
- Respondents also expressed that a blanket and a pillow are helpful for napping.

In comparison to the respondents who nap more than 30min and less than 30min, short time napping could have a good efficacy in reducing fatigue. Furthermore, sleeping on the table for a long period of time feels more uncomfortable around neck and head.

This questionnaire has great guiding significance for future design. In the limited space environment of the office, how to make people more comfortable and get an efficient rest is a design focus to be considered in the future. Especially for the desire of participants to successfully take a nap in a comfortable posture, fast falling asleep, and avoiding feeling tired after waking up. The weight of the head will compress the arms and

eyes, the vision will be blurred after waking, and the large angle of the spine will make breathing difficult.

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