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# The influence of japanese city pop music on emerging adults' sleep quality

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**Abstract**

*Purpose:* Previous studies suggest music as a low-risk, low-cost method to improve sleep quality, particularly beneficial for individuals with high-stress lifestyles. This research focuses on City Pop Music, chosen for its ability to evoke positive feelings and nostalgia, anticipating it will enhance sleep quality.

*Method:* Using a Pretest Post-test between Control Group Design, this study involves 10 participants equally divided into control and experimental groups. Treatment lasts 21 days, with data collection every 7 days. Data includes the Pittsburgh Sleep Quality Index, Bedtime Procrastination Scale, and Scale of Positive and Negative Experiences. Qualitative data was gathered through participant journaling and interviews.

*Result:* Sleep quality showed no improvement in participants exposed to city pop music ($p$=0.05; $p$>0.05). There were no changes in positive and negative experiences or bedtime procrastination. T-tests also showed that there were no differences between groups during treatment ($p$=0.59; $p$>0.05). However, qualitative data revealed feelings of calmness, enjoyment, and relaxation among participants.

*Conclusion*: While city pop music didn't enhance sleep quality, qualitative findings suggest it may induce calmness and relaxation. Possible factors contributing to these results include individual music preferences, room temperature, and sleep conditions. Future research is necessary to design interventions according to each person's preferences.

***Keywords:*** *city pop music; emerging adults; sleep quality*

## INTRODUCTION

Sleep is important for human to be functioning normally. According to the Indonesian Health Ministry, individuals ages 18-40 are recommended to have an adequate sleep duration of seven to eight hours (). Preliminary survey, however showed differently with 51 (46.4%) of 110 individuals aged 18-25 have six to seven hours of sleep, 28 (21.8%) have five to six hours, and 7 (6.3%) have less than five hours of sleep. Only 24 (25.5%) of 110 individuals that have more than seven hours of sleep. Furthermore, individuals that have less than seven hours of sleep reported that lacking sleep caused uncomfortable feeling, sleepiness, feeling tired physically, even changes in dietary habits. Chattu et al. (2019) reported that lack of sleep can have detrimental effects on cognitive processes, mood and decision-making, sleepiness or microsleeps, tiredness, mental health, immune systems, and burnout. Preliminary survey also showed that 17 individuals have difficulty on staying awake during driving, eating, or activities in social settings. Lack of sleep during adolescent and early adulthood is important, more so for health either in short or long term (Bruce et al., 2017). One third of individuals who had sleeping problems since 16 still have sleeping problems at 23, furthermore 10% are carried until 42 years old (Dregan & Armstrong, 2010). Emerging adults, who often have lifestyle that

disregard health, such as lack of sleep, because their need to deal with either school or work, even multiple works at once can produce stress (Arnett, 2018). This in turn can also result in poor sleep quality in emerging adults. A survey from Casper-Gallup in 2022 about The State of Sleep in America found that sleeping experience of 38% of 18–29-year-old individuals was mediocre and bad, 34% was fine, and 27% was very good. Concept analytics from (Nelson et al., 2022) found that good sleep quality provide merits such as feeling rested and refreshed, normal reflexes, satisfaction with sleep, even improved social and familial ties. Poor sleep quality, however, causes tiredness, irritability, daytime dysfunction, slowed response, increased consumption of caffeine, alcohol, carbohydrate, and fat, work errors, and disrupted social or familial ties.

There have been many alternatives to improve sleep quality, such as working out or sports, dietary control, and therapies for reducing stress. Listening to music also became one of the alternatives to improve sleep quality. Music became one of the non-pharmacological, low-risk and cost-effective method to improve both subjective and objective sleep quality (Cordi et al., 2019). Yamasato et al. (2020) research found that listening to music increase sleep quality in students in Japan. This research implies that there are potential differences between genres of music. Trahan et al., (2018) research further suggests that some genres of music that can help sleep were classic, rock, pop, acoustic, and jazz. Dickson & Schubert, (2022) also provide similar results, stating that classic, pop, ambient, folk, and alternative also help sleep. Trahan's research provides further explanations based on qualitative data from participants who reported that music affects to change their state which enables them to sleep, to distract unnecessary sounds both internally and externally, to provide them with a secondary experience that ease sleep process, and also for some participants it was their habit to listen to music before bedtime.

City pop, the genre used in this research is a genre relatively close with pop music in a broad sense, which is thought to be able to contribute to help sleep. City pop itself is used to refer to music piece from Japan in the 1970-80s. Survey research results from Sommet & Katō (2021) found that listeners of city pop is mostly online and aged 18-24 which differs from the actual listeners of city pop in Japan which aged 50 and above. Some respondents also stated that city pop helped them went through depression especially during the COVID-19 pandemic. City pop is often associated with happiness and love, but majority relates the song with the image of Japan in 1980s. Respondents from the survey realized that the nostalgia occurred did not surge from real felt experiences, this was because many of the respondents had not been born when the music was produced, this can be labelled as artificial nostalgia. Thus, coming from this nostalgia, city pop might improve sleep quality through positive emotions. Sedikides et al. (2021) concludes that nostalgia is an ambivalent emotion, with positive emotion more dominant. Otsuka et al. (2020) found that adolescent in Japan that has low subjective happiness have higher prevalence of sleep disruption such as insomnia, short sleep duration, and low sleep quality.

Considering that there is limited research regarding specific music city pop and that emerging adults are at the developmental stages with the most sleeping problem compared to other population in different age range. The purpose of this research is to examine the effect of city pop music with its nostalgic properties on emerging adult's sleep quality.

## METHOD

This research was carried out under the approval of the Health Research Ethics Committee from the Widya Mandala Surabaya Catholic University and was conducted accordingly to the CIOMS and WHO (2016) International Ethical Guidelines for Health-related Research Involving Humans, CIOMS Geneva.

This study uses pretest post-test between control group design experiment. The main variable used in this experiment was city pop music as the treatment and sleep quality as the dependent variable. There are two additional variables; bedtime procrastination and positive and negative experiences, both additional variables were added to provide more in-depth analysis. The number of research participants was ten people, divided into two groups, control and experimental group, with five people in each group. Majority of participants were 22 years old (n=6, 60%), followed by 23 years old (n=3, 30%), and the youngest participant being 20 years old (n=1, 10%). The mean of participants age was 22.1 and the standard deviation of participants was 0.875. Participants came from different parts of Indonesia, coming from Surabaya (n=5, 50%), Sidoarjo (n=2, 20%), Malang (n=1, 10%), and Bali (n=2, 20%). Each participant volunteered to take part in the research, which was then screened for their sleep quality scores. Inclusion criteria was volunteers scored 5 or more. Exclusion criteria were if volunteers have chronic illness and were under medication. All participants in this research were male. All participants were given compensation after finishing the protocol. Playlist used for the control group was classical music, which was the same with Harmat et al. (2008) research using '*The Most Relaxing Classical Music in The Universe'* album containing 30 classical pieces. Playlist used for the experimental group was city pop music using premade playlist from Spotify 'City Pop '70s' or 'City Pop '80s'. Participants in the experimental group were able to choose between the two playlists. The treatment lasted for 21 days for each participant, with each day participants listened to assigned music for 45 minutes when they were ready to sleep. Monitoring was done through either online call or long-range microphone. Participants were also asked to complete daily journal recording their activity during the day and their condition when waking up. Questionnaires were included in the journal booklet for every 7 days.

Sleep quality scores were collected during screening, first, second, third, and follow-up sessions, while bedtime procrastination and positive and negative experience scores were collected only during the first, second, third, and follow-up sessions. Reliability of the Pittsburgh Sleep Quality Index Indonesian Version with 18 items from Setyowati & Chung, (2021) showed Cronbach's α of 0.72 with items ranged from 0.69 to 0.72, in this study the reliability was 0.57. Higher scores of PSQI can be an indication of poor sleep quality. Bedtime Procrastination Scale from with 9 items shows Kroese et al. (2014) Cronbach's α of 0.88, in this study the reliability was 0.80. Higher scores of BPS shows a person is more likely to procrastinate their bedtime. Scale of Positive and Negative Experience with 12 items from Diener et al. (2010) shows Cronbach's α for positive feelings of 0.87 and negative feelings of 0.81. In this study the reliability was 0.77 for positive feelings, and 0.89. Scores from SPANE ranges from -24 to 24, with higher score indicating a more positive experience felt by participant.

Data were analysed using SPSS version 23 for Windows. Statistical method used in this research for main hypothesis testing was Friedman's Test because the assumptions for parametric testing were not met. T-tests were conducted to examine the differences between

groups and between sessions while correlation tests were conducted to examine the correlation between each variable. Qualitative data were collected from the participant's journal record during the treatment and follow-up interviews a week or two after the treatment. The data collected were then summarized and analysed to support the result of the study.

## RESULT

In Table 1, descriptive statistics for each variable from each group are presented. Results shows that sleep quality in the control group was found to improve gradually during the treatment (week 1-3). A spike in improvement was found during follow-up (5.8). Slight changes were seen in sleep quality score in the experimental group during the treatment (week 1-3) with scores improved on week 2 (4.2) but rebounded on week 3 (4.8). During follow-up, sleep quality score went up (5.4). Bedtime procrastination in control group gradually increased during treatment, in experimental group however, scores improved on week 2 (16) but went up on week 3 (19.4). During follow-up, bedtime procrastination in control group improved (23.6), the score in experimental group however increased (26.4). SPANE score in both groups had similar trend, with improvement on week 2 (C:6.8, E:7.8) but then decreased on week 3 (C:6.2, E:7.2). During follow-up, control group score improved further (7.6), experimental group score decreased quite significantly (4.2).

**Table 1**
*Average PSQI, BPS, and SPANE of Each Group*

| | Screening | Week 1 | Week 2 | Week 3 | Weekly Average | Follow-up |
|---|---|---|---|---|---|---|
| PSQI control | 8.6 | 8.8 | 8 | 7.2 | 8 | 5.8 |
| PSQI experiment | 7.8 | 5 | 4.2 | 4.8 | 4.6 | 5.4 |
| BPS control | - | 29 | 29.4 | 30 | 29.46 | 23.6 |
| BPS experiment | - | 24.6 | 16 | 19.4 | 20 | 26.4 |
| SPANE-positive control | - | 21.2 | 22 | 22.6 | 22.2 | 21.2 |
| SPANE-positive experiment | - | 19 | 20.2 | 20 | 17.4 | 19 |
| SPANE-negative control | - | 17.2 | 15.2 | 16.4 | 14.6 | 17.2 |
| SPANE-negative experiment | - | 13.4 | 12.4 | 12.8 | 13.2 | 13.4 |
| SPANE-balance control | - | 4 | 6.8 | 6.2 | 5.66 | 7.6 |
| SPANE-balance experiment | - | 5.6 | 7.8 | 7.2 | 6.86 | 4.2 |

Main hypothesis testing for sleep quality uses the Friedman's test as not all session scores met the normality assumption. However, post-hoc tests were still carried out to examine the data further. Normality using Shapiro-wilk test showed that all scores were not normal, $p$=0.256 for screening session, $p$=0.020 for treatment, and $p$=0.269 for follow-up. Checking for each session, week one score showed $p$=0.392, week two score showed $p$=0.000, and week three score showed $p$=0.098. Friedman's test in control group showed a coefficient of 0.74, $p$=0.692 which means that there were no differences of sleep quality during screening, treatment, and follow-up in control group. Experimental group's Friedman's test also showed same result, showed a

coefficient of 6, $p$=0.05 which means there were no differences of sleep quality during screening, treatment, and follow-up in the experimental group.

Post-hoc analysis for the control group showed no differences of sleep quality score between screening and treatment (mean difference of 0.6, $p$=1), no differences between treatment and follow-up (mean difference of 2.2, $p$=0.616), and no differences between screening and follow-up (mean difference of 2.8, $p$=0.601). Post-hoc analysis for the experimental group showed no differences between screening and treatment (mean difference of 3.13, $p$=0.195), no differences between treatment and follow-up (mean difference of 0.73, $p$=0.671), and no differences between screening and follow-up (mean difference of 2.3, $p$=0.485)

Independent sample t-test for screening score between control and experimental group showed that there was no difference of screening score between control and experimental group $t$=0.42, $p$=0.684. Mann-Whitney U test for treatment score between control and experimental group showed that there was no difference of treatment score between control and experimental group $u$=3.5, $p$=0.59. Similarly, there was no difference of follow-up score between control and experimental group $t$=0.27, $p$=0.794.

Kendall Tau-B was performed to check the correlation between bedtime procrastination and positive experiences to sleep quality during the treatment weeks score and average score in each group. **In control group**: Kendall Tau-B for week 1 between bedtime procrastination and sleep quality showed $p$=0.327, week 2 showed $p$=0.801, and week 3 showed $p$=0.448. Average score correlation showed $p$=0.624, which means that bedtime procrastination was not significantly correlated with sleep quality in the control group. Kendall Tau-B for positive experiences (SPANE balance) and sleep quality in week 1 showed $p$=0.327, week 2 showed $p$=0.801, and week 3 showed $p$=0.693. Average score correlation showed $p$=0.327, which means that positive experiences was not significantly correlated with sleep quality in the control group. **In experimental group**: similar results emerged with Kendall Tau-B for week 1 between bedtime procrastination and sleep quality showed $p$=0.602, week 2 showed $p$=0.480, and week 3 showed $p$=0.801. Average score correlation showed $p$=1, which means that bedtime procrastination was not significantly correlated with sleep quality in the experimental group. Kendall Tau-B for positive experiences (SPANE balance) and sleep quality in week 1 showed $p$=1, week 2 showed $p$=0.147, and week 3 showed $p$=0.118. Average score correlation showed $p$=0.142, which means that positive experiences was not significantly correlated with sleep quality in the experimental group.

Qualitative data summary is presented in Table 2, showing reports from booklet and follow up interviews of each participant. The notable reports from participants were taken from summarising the interviews. Participants in the control group reported that classical music promotes relaxation, faster sleep onset, reduced outside noise impact, increased sleep focus, and less phone use, calms mind and breathing, facilitates quicker and sustained sleep, and enhances relaxation, provides ease of sleep readiness and emotional calming through slow tempo. Experimental group participants reported similar results with city pop music, sometimes induced nostalgic feeling, making bedtime cozy. Familiar songs helped sleep well, stay focused, and feel calm. The music blocked out distractions and helped relax, better than watching videos. It also made sleep schedules regular and nights less tiring.

**Table 2**
*Self-Reports From Participants' Booklet And Interview*

| Participant Code | Self-rating | | | Notable reports |
|---|---|---|---|---|
| | Week 1 | Week 2 | Week 3 | |
| C1 | 4.1 | 3.5 | 3.5 | More relaxed, faster sleep onset, less affected by outside noises, increased focus on sleep, reduced phone interaction. |
| C2 | 3.7 | 4.2 | 4.2 | Calmer mind and breathing, quicker sleep onset, sustained sleep, deeper relaxation |
| C3 | 3.6 | 4.1 | 3.7 | More relaxed, calmer, easier to sleep. |
| C4 | 3.6 | 3.6 | 4.4 | Helped ease readiness to sleep. |
| C5 | 3.7 | 3.5 | 4.5 | Emotionally calming, relaxation through slow tempo, aided sleep. |
| E1 | 3.7 | 3.5 | 4.2 | Occasional nostalgia, provided some comfort before sleep, cozy/homey ambiance. |
| E2 | 3.5 | 3.7 | 4 | Song familiarity aids sleep, comfort until morning, blocks external noise, enhances focus. |
| E3 | 3 | 3.6 | 3.6 | Created a chill and relaxed atmosphere, neither helped nor distracting from sleep, aided in self-calming. |
| E4 | 4.1 | 4.1 | 4.2 | Increased calmness, aided in blocking out thoughts, enhanced focus on music, more effective than videos. |
| E5 | 3.7 | 3.7 | 3.8 | Induced nostalgia, maintained consistent sleep schedule, improved sleep organization, aided relaxation after tiring days |

## DISCUSSION

Hypothesis testing showed that there are no effects of city pop music on emerging adulthood's sleep quality. Post-hoc analysis also showed that there are no significant differences on sleep quality in both groups either during screening, treatment and follow-up. This result differs from Yamasato et al. (2020) research which found that listening to classical music improved sleep quality after treatment. T-test also found no significant difference of sleep quality between control and experimental group during screening, treatment, and follow-up. Non-significant result in this research might be influenced by other factors, considering that we could not control the participants' sleeping environment because of the field setting of this research. Controlling cofounding variables were done through asking the participants regarding the treatment and conditions (such as if there are any sickness). More thorough controlling was not done to prevent confounding variables to occur during the treatment. Various factors influencing these outcomes could also be attributed to musical characteristics. For instance, Chang et al., (2012) study on the impact of musical tempo on adults with chronic insomnia highlights that music within the 60-80 beats per minute (BPM) range, characterized by a smooth melody and devoid of abrupt shifts in volume or rhythm, has demonstrated efficacy in inducing a relaxation response. Shum et al. (2014) research also reported the same finding regarding sedative music effect on adult sleep quality that has tempo of 60-80 BPM, instrumental, and without lyrics. City pop music used in this research averaged at 111 BPM, which was faster than the tempo in the previous studies. With characteristics similar to jazz that has syncopations (Ye, 2006), city pop music might not be suitable for relaxation music.

Qualitative data was used to clarify some factors influencing the results. Participant in control group found that calmer feelings and sense of relaxation helped sleeping process, further adding that overall music helped their sleep. Participants also reported that music helped blocking out thoughts and external noises and providing comfort. This finding aligned with Trahan et al.

(2018) research about reasons why certain music helped sleep. The study found that the presence of music before sleep helped to block distraction either internally or externally, stimulating secondary experience, altering mental and physical conditions, providing relaxation, and facilitates one's habit. Participants in experimental group reported that it induced feeling of nostalgia, helped blocking noises from outside, and calmed oneself. Regarding nostalgia, not all participants in experimental group experienced this feeling. This aligns with Sommet & Katō (2021) research which stated that some respondents that enjoy city pop felt nostalgic even though they have never been in the past itself.

During treatment, it was found that there were no correlations between bedtime procrastination and sleep quality. This finding can be regarded as a new finding beside Magalhães et al. (2020) research which found that bedtime procrastination was negatively associated with sleep hours, self-control, and positively associated with lack of sleep and tiredness. This study also shows that there were no correlations between the two. This indicates that city pop with its nostalgic property did not merit, nor demerit positive experiences. This aligns with Barrett et al. (2010) research which tries to evaluate at what point did music induces nostalgia and found that nostalgia occurs when there is autobiographical salient, arousing, familiar, and when either induces positive, negative, or both emotions.

## CONCLUSION

While city pop music, quantitatively did not improve sleep quality, qualitatively it might suggest that city pop can induce feeling of calmness and relaxation in emerging adults. It can also be noted that city pop music did not demerit emerging adult's sleep quality. Regarding nostalgia which can be evoked through city pop and was proposed to be beneficial to aid sleep quality, this research has yet to present strong evidence. Future studies can replicate this study by executing it in the proper population, such as individuals who lived through the city pop music era and compare it with individuals who knew the song through internet (individual experiencing the nostalgia compared to individuals experiencing 'artificial' nostalgia).

However, these are some of the important evaluations that was noted after the research ended. First, the small and limited number of participants which causes difference of baseline score between the two groups. Researcher was also responsible for errors done during the protocol such as tardiness when collecting follow up data. Field environment which enables many uncontrolled factors to affect the protocol, which also caused by limited facilities provided by the researcher. It was also necessary to add further documentation and monitoring using a team of researchers and more robust instruments, such as the polysomnography to record sleep processes objectively.

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