NASKAH PUBLIKASI

HUBUNGAN INTENSITAS PERMAINAN *GAME ONLINE* PADA *GAME CENTER* TERHADAP GANGGUAN PENDENGARAN

Disusun oleh

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The Correlation between the Intensity of Playing Online Game in Game Center toward Hearing Disorder

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ABSTRAK :

Latar Belakang : Fasilitas yang digunakan dalam *game center* seperti *speaker* dalam jumlah yang banyak menimbulkan bising yang berpengaruh langsung pada pemain *game center*. Bising dapat menyebabkan berbagai gangguan terhadap kesehatan pendengaran. **Tujuan :** Untuk mengetahui hubungan intensitas permainan *game online* pada *game center* terhadap gangguan pendengaran. **Metode :** Penelitian ini merupakan penelitian dalam bentuk observasional analitik dengan pendekatan *cross-sectional* dengan jumlah sampel sebanyak 35 orang. Instrumen penelitian yang digunakan dalam penelitian ini adalah kuisioner dan *audiogram*. **Hasil :** Pada penelitian didapatkan 7 responden sudah bermain *game online* kurang dari satu tahun, 9 responden sudah bermain *game online* selama satu sampai tiga tahun, dan 19 responden sudah bermain *game online* selama lebih dari tiga tahun. **Kesimpulan :** Hasil penelitian menunjukkan bahwa bahwa terdapat hubungan yang signifikan antara lama bermain *game online* pada permainan *game center* dengan gangguan pedengaran dengan diperoleh $p<0,05$ ($p=0,016$ dan $p=0,006$). Pada penelitian ini juga didapatkan 9 responden bermain *game online* dengan durasi kurang dari tiga jam seminggu, 13 responden bermain *game online* dengan durasi empat sampai enam jam seminggu, dan 13 responden bermain *game online* dengan durasi lebih dari tujuh jam seminggu.

Kata kunci : Game online, game center, gangguan pendengaran.

ABSTRACT:

Background : Facilities in game center, such as speakers in large quantities that produce loud noise, give direct impact to online game players in game center. Noise could cause many kinds of disorder to human's hearing system. **Purpose :** To know the correlation between the intensity of playing online game in game center toward hearing disorder. **Method :** This study is an analytic observational research that uses cross-sectional approach toward 35 people who act as samples. Research instruments used in the study are questionnaire and pure tone audiogram. **Result :** Among these 35 respondents, 7 respondents have been playing online game for less than 1 year, 9 respondents have been playing online game for 1-3 years, and 19 respondents have been playing online game for more than 3 years. **Conclusion :** The result of this research shows that there is a significant correlation between duration of playing online game in game center and hearing disorders, with $p<0,05$ ($p=0,016$ and $p=0,006$). Based on this research, 9 respondents play online game for less than 3 hours in a week, 13 respondents play online game for 4-6 hours in a week, and 13 respondents play online game for more than 7 hours in a week.

Keywords: online game, game center, hearing disorder.

INTRODUCTION:

In the past 10 years, electronic game or usually called online game has improved a lot.[1]Facilities in game centers, such as speakers in large quantities that produce loud noise, could affect the online game players directly.[2] Loud noise could cause many kinds of disorder in human's hearing system. Hearing disorder is the most serious disorder since it could lead to deafness.[1] Deafness could be temporary or permanent. Hearing disorder that is caused by exposure to loud noise or Noise Induced Hearing Loss (NIHL) is one of the most common diseases found in noisy environment. Noise Induced Hearing Loss is a rudiment or hearing disorder in which the function of the sense of hearing is decreased as a result of exposure to intense and continually noise in a long period of time. Therefore, this research will analyze the correlation between the intensity of playing online game in game center toward hearing disorder.[2]

METHODS :

This research is an analytic observational research that uses cross-sectional approach toward 35 respondents. The respondents studied are gamers of online game who routinely play online game in game center, gamers who never suffer from ear infections or other ear diseases, and gamers who do not consume ototoxic medicines. Research instruments used in the study are questionnaire and pure tone audiogram. Research variables used in the study are duration and intensity of playing online game in game center as the free variable, and the result of threshold examination as the dependent variable. The data is analyzed statistically by using gamma test to know the relation between variables.

RESULTS:

Based on data obtained from questionnaire, the subject research range from 16 years old until 28 years old. The subject research who are 21 years old have the most frequency with percentage of 34,3%. The subject research who are 23 years old have percentage of 17,1%. The subject research who are 18 and 22 years old have percentage of 8,6%. The subject research who are 16, 20, and 26 years old have percentage of 5,7%. Whereas the subject research who are 17, 19, 24, 27, and 28 years old have percentage of 2,9%.

Table 1. Data of Respondent's Characteristics Based on Duration and Intensity of Playing Online Game

Subject Variable	Explanation	Frequency (%)
Average Duration (Mean±SD)	Year	2,34±0,802
Duration	Short Term (≤1 year)	7(20%)
	Long Term (1-3 years)	9(25,7%)
	Very Long Term (≥3 years)	19(54,%)
Average Intensity (Mean±SD)	Week	2,11±0,798
Intensity of Playing	Rare (≤3 hours in a week)	9(25,7%)
	Often (4-6 hours in a week)	13(37,1%)
	Very Often (≥7 hours in a week)	13(37,1%)

The number of online game players (gamers) who have been playing online game in game center for a very long term is 19 people (54,3%). The number of gamers who have been playing for a long term (1-3 years) is 9 people (25,7%). The number of gamers who have been playing for a short term (<1 year) is 7 people. The table above also shows us that the number of gamers who very often play online game in game center (7 hours or more) and the number of gamers who often play online game in game center (4-6 hours) is the same, which is 13 people (37,1%). Whereas there are 9 gamers (27,5%) who rare play online game in game center (3 hours or less)

Table 2. The Result of Threshold Examination (Audiometry) in the Frequency of 125 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, and 8000 Hz in Right Ear

	Threshold of hearing			Interpretation of results	
	<10 dB	**10dB - 25dB**	**≥25dB**	**Normal (<25dB)**	**Threshold (≥25dB)**
125 Hz	10(28,6%)	22(62,9%)	3(8,6%)	32(91.4%)	3(8,6%)
250 Hz	0(0%)	31(88,6%)	4(11,4%)	31(88,6%)	4(11,4%)
500 Hz	3(8,6%)	23(65,7%)	9(25,7%)	26(74,3%)	9(25,7%)
1000 Hz	0(0%)	30(85,7%)	5(14,3%)	30(85,7%)	5(14,3%)
2000 Hz	10(28,6%)	23(65,7%)	2(5,7%)	33(94,3%)`	2(5,7%)
4000 Hz	23(65,7%)	11(31,4%)	1(2,9%)	34(97,1%)	1(2,9%)
8000 Hz	24(68,6%)	10(28,6%)	1(2,9%)	34(97,1%)	1(2,9%)

Table 3. The Result of Threshold Examination (Audiometry) in the Frequency of 125 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, and 8000 Hz in Left Ear

	Threshold			Interpretation of results	
	<10 dB	**10dB-25dB**	**≥25 dB**	**Normal (<25dB)**	**Threshold (≥25dB)**
125 Hz	19(54,3%)	14(40 %)	2(5,7%)	33(94,3%)	2(5,7 %)
250 Hz	3(8,6 %)	30(85,7%)	2(5,7%)	33(94,3%)	2(5,7 %)
500 Hz	3(8,6 %)	29(82,9)	3(8,6%)	32(91,4%)	3(8,6 %)
1000 Hz	6(17,1 %)	26(74,3%)	3(8,6%)	32(91,4%)	3(8,6 %)
2000 Hz	12(34,3%)	20(57,1%)	3(8,6%)	32(91,4%)	3(8,6 %)
4000 Hz	18(51,4%)	16(45,7%)	1(2,9%)	34(97,1%)	1(2,9 %)
8000 Hz	24(68,6%)	10(28,6%)	1(2,9%)	34(97,1%)	1(2,9 %)

Table 4. The Result of Correlation Test Between Duration of Playing Online Game in Game Center and Hearing Disorder

The Value of Threshold in Frequency (dB)	**Coefficient Correlation (r)**	**Coefficient Determination (R^2)**	***p* Value**
125 Hz Right	-0,31	0,001	0,912
125 Hz Left	-0,139	0,005	0,593
250 Hz Right	-0,419	0,024	0,288
250 Hz Left	0,765	0,103	0,016
500 Hz Right	-0,217	0,018	0,406
500 Hz Left	0,791	0,122	0,006
1000 Hz Right	0,273	0,018	0,445
1000 Hz Left	0,283	0,022	0,270
2000 Hz Right	-0,382	0,048	0,104
2000 Hz Left	-0,233	0,031	0,354
4000 Hz Right	-0,082	0,01	0,778
4000 Hz Left	0,098	0,003	0,727
8000 Hz Right	0,225	0,016	0,468
8000 Hz Left	-0,363	0,045	0,233

After doing a statistic test, the result shows that there is a significant correlation between the duration of playing online game and hearing disorder in the frequency of 250 Hz and 500 Hz in left ear, since its value is $p<0,05$. In the frequency of 250 Hz, left ear's value is $p=0,016$ and in the frequency of 500 Hz, left ear's value is $p=0,006$. Whereas in other frequency, there is no significant correlation between the duration of playing online game and hearing disorder, since its value is $0>0,05$.

The biggest determination coefficient is in the frequency of 500 Hz in left ear, which 12,2%. It means that the variable of duration of playing online game have influence in the amount of 12,2% toward hearing disorder in

the frequency of 500 Hz in left ear. There is still 87,8% left, which consists of other factors related to hearing disorder.

Table 4.5 The Result of Correlation Test between the Intensity of Playing Online Game in Game Center and Hearing Disorder

The Value of Threshold in Frequency (dB)	Correlation Coefficient	Determination Coefficient (R^2)	*p* Value
125 Hz Right	0,212	0,013	0,335
125 Hz Left	0,114	0,000	0,678
250 Hz Right	0,395	0,028	0,388
250 Hz Left	0,221	0,012	0,565
500 Hz Right	0,220	0,023	0,456
500 Hz Left	0,156	0,008	0,696
1000 Hz Right	0,102	0,002	0,793
1000 Hz Left	0,130	0,010	0,686
2000 Hz Right	0,097	0,004	0,751
2000 Hz Left	-0,013	0,000	0,954
4000 Hz Right	-0,310	0,055	0,285
4000 Hz Left	-0,126	0,032	0,621
8000 Hz Right	0,273	0,009	0,364
8000 Hz Left	-0,176	0,094	0,510

After doing a statistic test, the result is the p value in all frequency is bigger than 0,05, which means there is no significant correlation between the intensity of playing online game in game center and hearing disorder. However, the p value that is closest to 0,05 is in the frequency of 4000 Hz in right ear, which is p=0,285.

The biggest value of determination coefficient also in the frequency of 4000 Hz in right ear, which is 5,5%. It means that the variable of the intensity of playing online game have influence in the amount of 5,5% toward hearing disorder in the frequency of 4000 Hz in right ear. There is still 94,5% left, which consists of other factors related to hearing disorder.

DISCUSSION:

Continous exposure to loud noise can disturb ear's function in hearing. If the noise exposure that is over the limit happen in a long period of time, this situation could lead to deafness. (Tjan et al., 2013).

Based on a study conducted by Pangemanan et al., (2012), noise affects human according to the level of exposure received by the human. In the level where the exposure is too much, noice could decrease human's hearing ability. The level of noise in workplace that has passed limit could cause hearing disorder if it happens in

a long period of time. If this noise exposure keeps going on without an effort to decrease it or to stay away from it, the hearing disorder could be permanent and incurable.

In this research, the p value is 0,016 in the frequency of 250 Hz in left ear and 0,006 in the frequency of 500 Hz in left ear. In other words, there is a significant correlation between the duration of playing online game in game center and hearing disorder because the p value obtained is 0,05.

The result of this research is in line with the result of a research conducted by Tumewu et al. in 2014 about the impact of noise toward workers of children game zone whose p=0,014 (p>0,05). It means workers who work under high intensity noise and work for ≥ 10 years have bigger risk of hearing disorder if compared with workers who work under low intensity noise and work for <10 years.

Sensorineural hearing loss caused by highly intense noise in a long period of time can cause many bad impacts, from tearing in organ of corti until total destruction of organ of corti. A very high intensity of noise in a long period of time cause change in metabolism and vascular, which leads to degenerative damage in the structure of hair cells in organ of corti. The damaged organ of corti causes permanent hearing loss. (Tumewu et al., 2014)

This study shows that the p value in all frequency is bigger than 0,05, which means there is no significant correlation between the intensity of playing online game in game center and hearing disorder. However, the p value that is closest to 0,05 is in the frequency of 4000 Hz in right ear, which is p=0,285. Based on this study, we can conclude that in the frequency of 4000 Hz, right ear has a bigger chance to make both variables connected and affects each other.

In this study, the biggest determination coefficient is in the frequency of 4000 Hz in right ear, which is 5,5%. It means the variable of the intensity of playing game online have influence in the amount of 5,5% toward hearing disorder in the frequency of 4000 Hz in right ear. There are still 94,5% left, which consists of other factors related with hearing disorder.

In the previous study conducted by Cholidah, 2006, entitled "Perbedaan Ambang Pendengaran Tenaga Kerja Setelah Terpapar Kebisingan dan Sesusah Bekerja pada Lingkungan Bising Departemen Ring Frame Unit Spinning I Pt. Apac Inti Corpora Bawen.", it is mentioned that a continous

working activity in a noisy workplace with high intensity of noise and 7 hours of exposure each day cause permanent hearing loss. Loud noise affects worker badly, especially affect their hearing system. They have high risk of decrease in hearing ability, which happens slowly and gradually.

CONCLUSIONS:

1. There is a correlation between the duration of playing online game in game center toward hearing disorder in which p<0,05, which are p=0,016 and p=0,06.
2. There is no correlation between the intensity of playing online game in game center toward hearing disorder because the result of threshold examination in all frequency is p>0,05

SUGGESTIONS:

1. The researcher should use cohort research design, where audiometry examination is done in the beginning and the end of research . Therefore, a more significant data can be obtained to know the correlation between noise exposure in online game in game center toward hearing disorder.
2. The researcher should include the variable of the intensity of noise that can be measured by using sound-level-meter.

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