性別、中高別、学年別にみた使用するインターネット使用ルール（質問67－5）

性別	中高別			インターネット使用ルールサービス（複数回答可）						
				使用時間設定	使用終了時刻設定	使用場所設定	フィルタリング	その他	制限なし	合計
男	中学 学年	1年生	度数	386	189	223	313	74	737	1775
			学年 の %	21.7	10.6	12.6	17.6	4.2	41.5	100.0
		2年生	度数	322	156	208	324	53	912	1833
			学年 の %	17.6	8.5	11.3	17.7	2.9	49.8	100.0
		3年生	度数	291	114	208	346	46	975	1834
			学年 の %	15.9	6.2	11.3	18.9	2.5	53.2	100.0
		不明	度数	5	0	0	3	0	10	20
			学年 の %	25.0	0.0	0.0	15.0	0.0	50.0	100.0
		合計	度数	1004	459	639	986	173	2634	5462
			学年 の %	18.4	8.4	11.7	18.1	3.2	48.2	100.0
	高校 学年	1年生	度数	225	141	176	524	47	1690	2666
			学年 の %	8.4	5.3	6.6	19.7	1.8	63.4	100.0
		2年生	度数	206	69	141	497	30	1665	2559
			学年 の %	8.1	2.7	5.5	19.4	1.2	65.1	100.0
		3年生	度数	216	51	141	382	30	1503	2252
			学年 の %	9.6	2.3	6.3	17.0	1.3	66.7	100.0
		不明	度数	2	0	1	10	1	17	32
			学年 の %	6.3	0.0	3.1	31.3	3.1	53.1	100.0
		合計	度数	649	261	459	1413	108	4875	7509
			学年 の %	8.6	3.5	6.1	18.8	1.4	64.9	100.0
女	中学 学年	1年生	度数	328	228	223	250	99	596	1512
			学年 の %	21.7	15.1	14.7	16.5	6.5	39.4	100.0
		2年生	度数	235	183	212	279	54	669	1449
			学年 の %	16.2	12.6	14.6	19.3	3.7	46.2	100.0
		3年生	度数	198	117	179	325	33	835	1531
			学年 の %	12.9	7.6	11.7	21.2	2.2	54.5	100.0
		不明	度数	2	0	2	5	0	8	17
			学年 の %	11.8	0.0	11.8	29.4	0.0	47.1	100.0
		合計	度数	763	528	616	859	186	2108	4509
			学年 の %	16.9	11.7	13.7	19.1	4.1	46.8	100.0
	高校 学年	1年生	度数	174	142	206	724	52	1420	2516
			学年 の %	6.9	5.6	8.2	28.8	2.1	56.4	100.0
		2年生	度数	107	91	156	745	43	1487	2495
			学年 の %	4.3	3.6	6.3	29.9	1.7	59.6	100.0
		3年生	度数	107	45	129	539	30	1609	2397
			学年 の %	4.5	1.9	5.4	22.5	1.3	67.1	100.0
		不明	度数	2	1	2	5	0	13	20
			学年 の %	10.0	5.0	10.0	25.0	0.0	65.0	100.0
		合計	度数	390	279	493	2013	125	4529	7428
			学年 の %	5.3	3.8	6.6	27.1	1.7	61.0	100.0

性別、中高別、学年別にみた使用するインターネット使いすぎでのトラブル経験（質問67－6）

性別	中高別			インターネット使いすぎでのトラブル経験（複数回答可）								
				遅刻	居眠り	成績低下	欠席	年30日以上長期欠席	友達トラブル	暴言暴力	その他	合計
男	中学 学年	1年生	度数	61	163	300	16	4	45	31	331	1775
			学年 の %	3.4	9.2	16.9	0.9	0.2	2.5	1.7	18.6	100.0
		2年生	度数	102	288	407	25	4	47	32	290	1833
			学年 の %	5.6	15.7	22.2	1.4	0.2	2.6	1.7	15.8	100.0
		3年生	度数	124	370	422	31	9	76	41	231	1834
			学年 の %	6.8	20.2	23.0	1.7	0.5	4.1	2.2	12.6	100.0
		不明	度数	2	3	1	0	0	1	1	4	20
			学年 の %	10.0	15.0	5.0	0.0	0.0	5.0	5.0	20.0	100.0
		合計	度数	289	824	1130	72	17	169	105	856	5462
			学年 の %	5.3	15.1	20.7	1.3	0.3	3.1	1.9	15.7	100.0
	高校 学年	1年生	度数	187	737	751	43	11	120	38	294	2666
			学年 の %	7.0	27.6	28.2	1.6	0.4	4.5	1.4	11.0	100.0
		2年生	度数	202	668	635	44	7	85	42	275	2559
			学年 の %	7.9	26.1	24.8	1.7	0.3	3.3	1.6	10.7	100.0
		3年生	度数	221	603	394	55	17	63	25	231	2252
			学年 の %	9.8	26.8	17.5	2.4	0.8	2.8	1.1	10.3	100.0
		不明	度数	4	11	7	0	0	0	0	4	32
			学年 の %	12.5	34.4	21.9	0.0	0.0	0.0	0.0	12.5	100.0
		合計	度数	614	2019	1787	142	35	268	105	804	7509
			学年 の %	8.2	26.9	23.8	1.9	0.5	3.6	1.4	10.7	100.0
女	中学 学年	1年生	度数	29	160	285	12	4	109	29	229	1512
			学年 の %	1.9	10.6	18.8	0.8	0.3	7.2	1.9	15.1	100.0
		2年生	度数	46	246	393	22	4	121	24	191	1449
			学年 の %	3.2	17.0	27.1	1.5	0.3	8.4	1.7	13.2	100.0
		3年生	度数	53	285	416	20	5	114	25	197	1531
			学年 の %	3.5	18.6	27.2	1.3	0.3	7.4	1.6	12.9	100.0
		不明	度数	1	2	2	0	0	1	0	0	17
			学年 の %	5.9	11.8	11.8	0.0	0.0	5.9	0.0	0.0	100.0
		合計	度数	129	693	1096	54	13	345	78	617	4509
			学年 の %	2.9	15.4	24.3	1.2	0.3	7.7	1.7	13.7	100.0
	高校 学年	1年生	度数	78	658	821	31	6	123	17	220	2516
			学年 の %	3.1	26.2	32.6	1.2	0.2	4.9	0.7	8.7	100.0
		2年生	度数	89	655	648	22	7	126	17	226	2495
			学年 の %	3.6	26.3	26.0	0.9	0.3	5.1	0.7	9.1	100.0
		3年生	度数	94	560	426	28	1	118	13	202	2397
			学年 の %	3.9	23.4	17.8	1.2	0.0	4.9	0.5	8.4	100.0
		不明	度数	2	6	1	0	0	2	0	6	20
			学年 の %	10.0	30.0	5.0	0.0	0.0	10.0	0.0	30.0	100.0
		合計	度数	263	1879	1896	81	14	369	47	654	7428
			学年 の %	3.5	25.3	25.5	1.1	0.2	5.0	0.6	8.8	100.0

The association between problematic Internet and alcohol use: An epidemiological study

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Abstract

This study aimed to clarify the associations between problematic Internet use and the frequency of alcohol consumption, the amount of alcohol consumed, and opinions related to alcohol use in Japanese adolescents. A self-administered questionnaire survey was administered to students enrolled in randomly selected junior and senior high schools throughout Japan, and responses from 101,134 students were obtained. The results of multiple logistic regression analyses indicated that the adjusted odds ratios for Internet addiction and excessive Internet use were higher as the number of days in which alcohol was consumed during the previous 30 days increased. In addition, the adjusted odds ratio for excessive Internet use indicated a dose-dependent association for the amount of alcohol consumed per session. With regard to views on alcohol use, the adjusted odds ratio for Internet addiction was highest for those who thought alcohol was good for their health or who thought that the prohibition against underage drinking was wrong. This study revealed

that adolescents with problematic Internet use consumed alcohol more frequently, consumed a greater amount of alcohol, and had affirmative views of alcohol use.

Introduction

With the rapid global popularization of the Internet in recent years, the issue of problematic Internet use (PIU), such as Internet addiction (IA) and excessive Internet use (EIU), among adolescents has arisen. Recent studies have reported that PIU is associated with depression and anxiety (Fu et al., 2010; Ko et al., 2009b; Lee et al., 2013; Liu et al., 2011; Mythily et al., 2008; Yen et al., 2007), sleep disorders (e.g., excessive daytime sleepiness; (Choi et al., 2009), and substance use (e.g., tobacco; (Lee et al., 2013; Liu et al., 2011). PIU among adolescents is a public-health problem that has recently emerged and requires corrective actions.

Another public-health issue is alcohol use among adolescents. This issue has pre-dated PIU and, thus, has been extensively studied. According to a nationwide study on junior and senior high school students in Japan (Osaki et al., 2009), the proportion of students who consumed alcohol tended to decrease after the year 2000. During that same period, the Internet utilization rate of Japanese adolescents increased from 72.8% (2001) to 95.5% (2009) (Communications, 2012). With wider use of the Internet, the number of adolescents consuming alcohol may have decreased as a result of a lack of time for drinking. With regard to a potential association between IA and alcohol use among adolescents, study results have varied. Researchers have reported the presence of an association (Lam et al., 2009), a weak association (Johansson and Gotestam, 2004), and no significant association (Lee et al., 2013). In addition, a study (Choi et al., 2009) has suggested that overindulgence in Internet use among adolescents might decrease their alcohol use. However, to our knowledge, few studies have reported associations between PIU and the frequency and amount of alcohol use or views on alcohol use among adolescents. Hence, in the present study, we conducted a survey on PIU (e.g., IA) and alcohol use among junior and senior high school students in Japan.

This study is one of a series of nationwide surveys on lifestyle habits (i.e., alcohol use, smoking, eating, and sleeping) in Japanese junior and senior high school students.

Methods

Participants

A single-stage cluster sampling method was employed. First, 10,018 junior high and 4,603

senior high schools (14,621 in total) as of May 2011 in Japan were registered for this study. Among them, 140 junior high (selection rate: 1.4%) and 124 senior high schools (selection rate: 2.7%) were randomly selected.

In the Japanese education system, children enter primary school at the age of 6 years and leave after 6 years of study. They then enter junior high school for 3 years of study, followed by a further 3 years at senior high school. In this report, the first to third years of junior high school are called the 7th to 9th grades, and the first to third years of senior high school are called the 10th and 12th grades.

Procedure

We sent a letter requesting cooperation in our survey to each selected school, along with the same number of questionnaires and envelopes as that of students enrolled. At each school where the principal had approved participation in our survey, teachers delivered the questionnaires to the students. After filling out the questionnaire, each student was requested to place the completed questionnaire in the envelope supplied and then seal it with an adhesive flap. The teachers were requested to send back the sealed envelopes to the Nihon University School of Medicine without opening them. The survey was conducted between October 2012 and March 2013. This study was approved by the Ethics Committee of the Nihon University School of Medicine.

Response Rates

Of the selected junior and senior high schools, 94 and 85 returned responses, respectively, (school cooperation rate: 67.1% and 68.5%, respectively). Thus, 179 out of 264 junior and senior high schools returned responses (overall school cooperation rate: 67.8%). Of the 109,847 student participants, 101,134 responded to the questionnaire (38,871 [92.6%] junior high and 62,263 [91.7%] senior high school students), for a 92.1% overall response rate. The eventual response rates were 59.8% and 61.3% for junior and senior high schools, respectively (60.7% in total). From the collected questionnaires, 1,084 were excluded because the respondent's sex or grade was not specified, or the responses were inconsistent. Data from the remaining 100,050 questionnaires (38,494 and 61,556 from junior and senior high schools, respectively) were analyzed.

Measures

The questionnaire items used in this study were developed by taking into account the questionnaires used in past, similar, studies. With regard to use of the Internet, 8 questions were translated into Japanese from the Young Diagnostic Questionnaire for Internet Addiction (YDQ) (Young, 1998) and added to the current questionnaire. Similar to previous studies with adolescents (Fu et al., 2010; Johansson and Gotestam, 2004; Stavropoulos et al., 2013), IA was defined as an affirmative answer to at least 5 of the 8 YDQ questions. We also included a question on the average number of hours spent using the Internet per weekday during the previous 30 days. EIU was defined as 5 or more hours of use per day, based on a previous study with adolescents (Mythily et al., 2008).

With regard to alcohol use and smoking status, we included questions on the number of days during the past 30 that the respondent used alcohol or smoked (the response options included: "none," "1–5 days," "6–19 days," and "≥20 days") and on the amount of alcohol consumption per session (the response options included: "not drinking," "less than one glass," "1–2 glasses," "3–5 glasses," and "≥6 glasses"). Students who consumed alcohol 1 or more days during the previous 30 were defined as habitual alcohol consumers. In addition, to asses views on alcohol use, we included questions on respondents' opinions of the underage-drinking prohibition (response options included: "the prohibition is understandable," "I have no choice but to abide by it," "the prohibition is wrong," and "drinking alcohol or not must be put at one's disposal") and on the respondents' opinions on the physical effects of alcohol use (response options included: "alcohol use is physically harmful," "alcohol use is somewhat physically harmful but not seriously harmful," "alcohol use is neither good nor bad for one's health," "alcohol use is good for one's health," and "I don't know").

With regard to mental health status, the 12-item General Health Questionnaire (GHQ-12) was employed. The GHQ-12 is a self-administered questionnaire designed as a screening tool for mental diseases (D'Arcy and Siddique, 1984; Doi and Minowa, 2003). It consists of 2 factors—"depression and anxiety" and "decrease in positive feeling"—and a total of 12 items (6 items for each factor). One question from each of the 2 factors was selected for the current study, and those who answered affirmatively to either question were defined as having poor mental health; some previous studies (Morioka et al., 2013; Munezawa et al., 2011) with adolescents employed the same definition.

In addition, questions on personal information, lifestyle habits, and school were included in

the questionnaire.

Data analysis

We performed multiple logistic regression analyses to calculate the adjusted odds ratios (AORs) for adolescents who were addicted to the Internet or who had EIU (i.e., ≥5 hours) for both the number of days alcohol was consumed and the amount of alcohol consumed per session during the previous 30 days. Regarding the covariates, the following 8 demographic factors were used to eliminate confounding factors: sex, age, eating breakfast, bedtime, smoking, intention to study at a university, participating in extracurricular activities, and poor mental health (GHQ score ≥1). Next, we performed multiple logistic regression analyses to calculate the AORs for adolescents addicted to the Internet among habitual alcohol consumers for their views on the physical effects of alcohol use and on the underage-drinking prohibition. Regarding the covariates, the abovementioned 8 demographic factors were used to eliminate confounding factors. All analyses were performed using SPSS 16.0 for Windows.

Results

The AOR for the adolescents who were addicted to the Internet increased with an increase in the number of days alcohol was used during the previous 30 days ($P<0.01$). With respect to the amount of alcohol consumed per session, the AOR for the adolescents who were addicted to the Internet was highest for those who consumed ≥6 glasses (AOR: 1.74, 95% CI: 1.51–2.01, $P<0.01$). The AORs for adolescents who had EIU (≥ 5 hours) increased with an increase in the number of days alcohol was consumed or the amount consumed per session during the previous 30 days ($P<0.01$; see Table 1).

With respect to views on the physical effects of alcohol use, the AOR for adolescents who were addicted to the Internet among habitual alcohol consumers was the highest for those who thought alcohol consumption was good for one's health (AOR: 1.70, 95% CI: 1.38–2.10, $P=0.02$). With respect to views on the underage-drinking prohibition, the AOR for adolescents who were addicted to the Internet among habitual alcohol consumers was the highest for those who thought the underage-drinking prohibition was wrong (AOR: 1.34, 95% CI: 1.06–1.71, $P<0.01$; see Table 2).

Discussion

We believe that the present sample is representative of Japanese adolescents because (1) the participating schools were randomly selected from junior and senior high schools nationwide and (2) more than 100,000 responses were analyzed.

The present study revealed that the risk of PIU among adolescents was higher as the number of days alcohol was consumed and the amount consumed per session during the previous 30 days increased. In addition, it was revealed that IA among adolescents was associated with positive views on alcohol use. These results suggest that popularization of the Internet among adolescents may not lead to a decrease in alcohol consumption among in that age group.

We have inferred some reasons for the observed association between Internet and alcohol use among adolescents. One possibility is that PIU and alcohol use may be different symptoms of a single underlying disorder or disease. An experimental study (Ko et al., 2009a) reported that activation of the same brain sites were involved in PIU and substance dependency. Moreover, PIU and substance dependency were reported to be linked from a phenomenological viewpoint (Liu and Potenza, 2007). The present results also suggest that PIU and alcohol use are symptoms of a single disorder or disease. However, the disease concept for PIU, including IA, has not been established yet; thus, a discussion in the literature is necessary in order to establish the disease concept. Another possibility is the effect of insomnia. The prevalence of symptoms of insomnia (i.e., difficulty in initiating sleep, difficulty in maintaining sleep, and early morning awakening) has been reported to be higher among adolescents who are addicted to the Internet than adolescents who are not addicted (Choi et al., 2009). Moreover, insomnia in adolescents has been associated with alcohol use (Kaneita et al., 2006; Morioka et al., 2013). In addition to insomnia, aggressive behaviors (e.g., serious fights and carrying weapons) have been associated with PIU (Liu et al., 2011) and alcohol use (Chen et al., 2008) among adolescents. Thus, future research should consider the effects of these confounding factors when examining the association between Internet and alcohol use among adolescents.

The present study has some limitations. First, because a cross-sectional design was used, a causal relationship between PIU and alcohol use could not be determined. Second, a non-response bias may have occurred, as certain schools and students chose not to participate. Moreover, data from long-term absentees are not reflected in the current analyses. Third, the use of a self-administered questionnaire may have resulted in a reporting bias. For

instance, data on the number of days alcohol was consumed and the amount consumed may have been subject to a recall bias. Moreover, because underage drinking is illegal in Japan, the respondents may have tended to underreport their alcohol consumption.

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(Table 1)

Multiple logistic regression analyses on the association between alcohol use and problematic Internet use

Internet addiction was defined as an affirmative response to at least 5 of 8 questions from the Japanese version of the Young Diagnostic Questionnaire for Internet Addiction (YDQ; Young. 1998).

Excessive Internet use was defined as an average of ≥5 hours of Internet use per weekday during the previous 30 days.

(Table 2)

Multiple logistic regression analyses on the associations between views on the physical effects of alcohol use, views on the underage-drinking prohibition, and Internet addiction among those with habitual alcohol consumption

Views on the physical effects of alcohol use:

Alcohol use is physically harmful.

Alcohol use is somewhat physically harmful but not seriously harmful.

Alcohol use is neither good nor bad for one's health.

Alcohol use is good for one's health.

I don't know.

Views on the underage-drinking prohibition:

The prohibition is understandable.

I have no choice but to abide by it.

The prohibition is wrong.

Drinking alcohol or not must be put at one's disposal.

Students who consumed alcohol on 1 or more days during the previous 30 days were defined as habitual alcohol consumers.

References

Chen, C.Y., Storr, C.L., Tang, G.M., Huang, S.L., Hsiao, C.K., Chen, W.J., 2008. Early alcohol experiences and adolescent mental health: a population-based study in Taiwan. Drug Alcohol Depend 95, 209-218.

Choi, K., Son, H., Park, M., Han, J., Kim, K., Lee, B., Gwak, H., 2009. Internet overuse and excessive daytime sleepiness in adolescents. Psychiatry and clinical neurosciences 63, 455-462.

Communications, M.o.I.a.a., 2012. Communications Usage Trend Survey. http://www.soumu.go.jp/johotsusintokei/english/.accessed on 2014/03/02.

D'Arcy, C., Siddique, C.M., 1984. Psychological distress among Canadian adolescents. Psychological medicine 14, 615-628.

Doi, Y., Minowa, M., 2003. Factor structure of the 12-item General Health Questionnaire in the Japanese general adult population. Psychiatry and clinical neurosciences 57, 379-383.

Fu, K.W., Chan, W.S., Wong, P.W., Yip, P.S., 2010. Internet addiction: prevalence, discriminant validity and correlates among adolescents in Hong Kong. Br J Psychiatry 196, 486-492.

Johansson, A., Gotestam, K.G., 2004. Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12-18 years). Scandinavian journal of psychology 45, 223-229.

Kaneita, Y., Ohida, T., Osaki, Y., Tanihata, T., Minowa, M., Suzuki, K., Wada, K., Kanda, H., Hayashi, K., 2006. Insomnia among Japanese adolescents: a nationwide representative survey. Sleep 29, 1543-1550.

Ko, C.H., Liu, G.C., Hsiao, S., Yen, J.Y., Yang, M.J., Lin, W.C., Yen, C.F., Chen, C.S., 2009a. Brain activities associated with gaming urge of online gaming addiction. Journal of psychiatric research 43, 739-747.

Ko, C.H., Yen, J.Y., Chen, C.S., Yeh, Y.C., Yen, C.F., 2009b. Predictive values of psychiatric symptoms for internet addiction in adolescents: a 2-year prospective study. Arch Pediatr Adolesc Med 163, 937-943.

Lam, L.T., Peng, Z.W., Mai, J.C., Jing, J., 2009. Factors associated with Internet addiction among adolescents. Cyberpsychology & behavior : the impact of the Internet, multimedia and virtual reality on behavior and society 12, 551-555.

Lee, Y.S., Han, D.H., Kim, S.M., Renshaw, P.F., 2013. Substance abuse precedes Internet

addiction. Addictive behaviors 38, 2022-2025.

Liu, T., Potenza, M.N., 2007. Problematic Internet use: clinical implications. CNS spectrums 12, 453-466.

Liu, T.C., Desai, R.A., Krishnan-Sarin, S., Cavallo, D.A., Potenza, M.N., 2011. Problematic Internet use and health in adolescents: data from a high school survey in Connecticut. J Clin Psychiatry 72, 836-845.

Morioka, H., Itani, O., Kaneita, Y., Ikeda, M., Kondo, S., Yamamoto, R., Osaki, Y., Kanda, H., Higuchi, S., Ohida, T., 2013. Associations between sleep disturbance and alcohol drinking: A large-scale epidemiological study of adolescents in Japan. Alcohol (Fayetteville, NY) 47, 619-628.

Munezawa, T., Kaneita, Y., Osaki, Y., Kanda, H., Minowa, M., Suzuki, K., Higuchi, S., Mori, J., Yamamoto, R., Ohida, T., 2011. The association between use of mobile phones after lights out and sleep disturbances among Japanese adolescents: a nationwide cross-sectional survey. Sleep 34, 1013-1020.

Mythily, S., Qiu, S., Winslow, M., 2008. Prevalence and correlates of excessive Internet use among youth in Singapore. Annals of the Academy of Medicine, Singapore 37, 9-14.

Osaki, Y., Tanihata, T., Ohida, T., Kanda, H., Suzuki, K., Higuchi, S., Kaneita, Y., Minowa, M., Hayashi, K., 2009. Decrease in the prevalence of adolescent alcohol use and its possible causes in Japan: periodical nationwide cross-sectional surveys. Alcoholism, clinical and experimental research 33, 247-254.

Stavropoulos, V., Alexandraki, K., Motti-Stefanidi, F., 2013. Recognizing internet addiction: prevalence and relationship to academic achievement in adolescents enrolled in urban and rural Greek high schools. Journal of adolescence 36, 565-576.

Yen, J.Y., Ko, C.H., Yen, C.F., Wu, H.Y., Yang, M.J., 2007. The comorbid psychiatric symptoms of Internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. The Journal of adolescent health : official publication of the Society for Adolescent Medicine 41, 93-98.

Young, K.S., 1998. Internet addiction: The emergence of a new clinical disorder. Cyber Psychology and Behavior 1, 237-244.

Table 1 Multiple logistic regression analyses on the association between alcohol use and problematic Internet use

	Internet Addiction			
	N	AOR	95%CI	P Value
The number of days in which alcohol was consumed				<0.01
None	85,724	1.00		
1-5 days	9,951	1.49	1.39 - 1.60	
6-19 days	1,376	1.62	1.38 - 1.90	
20 days	343	3.28	2.49 - 4.31	

	Internet Addiction			
	N	AOR	95%CI	P Value
Amount of alcohol consumed per drinking session				<0.01
Not drinking	61,904	1.00		
Less than a glass	18,402	1.34	1.26 - 1.42	
1 or 2 glasses	10,960	1.46	1.36 - 1.57	
3-5 glasses	4,393	1.45	1.31 - 1.61	
≥6 glasses	1,964	1.74	1.51 - 2.01	

	Excessive Internet Use			
	N	AOR	95%CI	P Value
The number of days in which alcohol was consumed				<0.01
None	85,860	1.00		
1-5 days	9,981	1.85	1.75 - 1.95	
6-19 days	1,388	2.40	2.12 - 2.72	
20 days	339	3.49	2.74 - 4.44	

	Excessive Internet Use			
	N	AOR	95%CI	P Value
Amount of alcohol consumed per drinking session				<0.01
Not drinking	62,125	1.00		
Less than a glass	18,361	1.19	1.13 - 1.25	
1 or 2 glasses	10,947	1.91	1.81 - 2.02	
3-5 glasses	4,410	2.62	2.43 - 2.83	
≥6 glasses	1,950	3.23	2.89 - 3.60	

Abbreviations:AOR, adjusted odds ratio; CI, confidence interval
Internet addiction was defined as an affirmative response to at least 5 of 8 questions from the Japanese version of the Young Diagnostic Questionnaire for Int
Excessive Internet use was defined as an average of ≥5 hours of Internet use per weekday during the previous 30 days.
Sex, Grade, Having breakfast, Bedtimes, Intending to study at university, Participating in extracirricular activities, Smoking and Mental health status were use
Subjects with missing data were excluded from the analysis.

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21 世紀出生児縦断調査結果による児童対象の健康に関するコホート調査

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研究要旨
厚生労働省は 2001 年に出生した乳児を対象（現在 11 歳）に、コホート研究を実施している。その調査結果（データ）を年度内に統計情報部より入手し、対象児の食生活や運動、肥満、睡眠問題に関する関連要因を分析し、未成年の健康づくりに役立てる。

A. 研究目的

厚生労働省は健康づくりの一環としての健康日本 21（第２次）の中で生活習慣改善など 53 項目（栄養・食生活、運動、休養、飲酒、喫煙など）について目標値を設定した。また、そこでは生活習慣の改善を含めた健康づくりを推進するため乳幼児から高齢者までの健康課題等の把握を行うことも提言している。今まで、20 歳以上の成人についての健康課題および生活習慣は厚生労働省が実施する国民健康・栄養調査で把握しており、またこの調査結果は健康づくりや生活習慣病対策の基礎的データにもなっている。中高年の生活習慣病対策には 10 歳代からの生活習慣改善の重要性が内外から指摘されており、将来の健康づくりのために未成年に対する健康課題および生活習慣についてその動向を明らかにすることは重要と考える。

B. 調査方法

厚生労働省は 2001 年に出生した乳児を対象（現在 11 歳）に 21 世紀出生児縦断調査、いわゆるコホート研究を実施している。その調査結果（データ）を 26 年度内に統計情報部より入手し、対象児の食生活や運動、肥満、睡眠問題に関する関連要因を分析し、未成年の健康づくりに役立てることを目的として研究を実施した。

（１）21 世紀出生児縦断調査の説明

1）調査の目的

この調査は、同一客体を長年にわたって追跡調査する縦断調査として、平成１３年度から実施を始めた承認統計であり、２１世紀の初年に出生した子の実態及び経年変化の状況を継続的に観察することにより、少子化対策等厚生労働行政施策の企画立案、実施等のための基礎資料を得ることを目的としている。

2）調査の対象

全国の２００１年に出生した子を対象とし、１月１０日から１７日の間及び７月１０日から１７日の間に出生した子のすべてを調査の客体とした。

3)調査の時期

１月出生児については平成１３年８月１日現在、７月出生児については平成１４年２月１日現在とした。（月齢６ヵ月）

4)調査事項

保育者、同居者、就業状況、労働時間、父母の家事・育児分担状況、住居の状況、子育てで意識していること、子どもをもってよかったと思うこと、子どもをもって負担に思うこと、子育ての不安や悩みの有無、授乳の状況、収入の状況　等。

5)調査の方法

厚生労働省が人口動態調査出生票を基に調査客体を抽出した。対象世帯への調査票の配布、及び対象世帯から厚生労働省への調査票の回収は郵送により行った。

6)調査票の回収状況等

調査票の配布数及び回収数は以下のとおりである。

調査票の回収状況

	配布数	回収数	回収率（%）
１月出生児	26,620	23,421	88.0
７月出生児	26,955	23,589	87.5
計	53,575	47,010	87.7

(2)11回の21世紀出生児縦断調査

(1)と同様な調査方法で、11回調査を毎年実施した。11回目の調査では32,913の回答があった。従って11年後の追跡率は32,913/53,575の61.4%であった。

C. 結果・考察

出生７年後と10年後の１日のテレビ及びゲームの使用時間と虫歯で通院した割合を表１に示すとテレビ及びゲームの使用時間が長いほど、虫歯での通院率が高くなる傾向があり、テレビを見ながらあるいはゲームをしながら甘いものを食べる傾向があると推測された。また、表２は出生７年後と10年後の１日のテレビ及びゲームの使用時間と体重・身長の４年間の変化を示したが、男女ともテレビやゲームは体重の増加をもたらすものと推測された。さらにテレビやゲームは登校時（平日）の就寝時間と学習時間にも影響があると考えられる（表３，４）。

表５に１０年後における携帯電話所有と登校時の就寝時間を示したが、携帯電話を所有している児童は就寝時間が遅くなる傾向がある。また、表６は携帯電話所有と体重・身長の変化の関連性を示したが、携帯電話を持っている児童は体重増加が大きくなる傾向があった。

表７に出生時の体重と１０年間のぜんそく罹患率を示すと、出生児体重が少ないほどぜんそくになる傾向があると考えられた。同様にアトピー性皮膚炎を比較するとぜんそくのような傾向は認められなかった。

表９及び１０は母乳・人工乳別の５年６か月後及び１年６か月後の肥満傾向を見たが、人工乳だけの幼児は肥満傾向が認められた。

D. 健康危機管理情報

なし

E. 学会発表

なし

表１　出生７年後と１０年後の１日のテレビ及びゲームの合計使用時間別と虫歯での通院の割合

	7年後4時間未満 10年後4時間未満	7年後4時間以上 10年後4時間未満	7年後4時間未満 10年後4時間以上	7年後4時間以上 10年後4時間以上	合計	p値
11年後						
虫歯の通院率						
男	31.9%	33.7%	37.0%	37.0%	33.4%	p<0.01
(n)	(11647)	(733)	(2372)	(1146)	(15898)	
女	29.6%	33.5%	35.4%	36.2%	30.6%	P<0.01
(n)	(12318)	(505)	(1471)	(478)	(14772)	
10年後						
虫歯の通院率						
男	32.9%	36.9%	38.1%	40.0%	34.4%	p<0.01
(n)	(12362)	(808)	(2556)	(1250)	(16976)	
女	31.5%	34.0%	37.1%	39.5%	32.4%	p<0.01
(n)	(13074)	(535)	(1584)	(514)	(15707)	

P:カイ二乗検定

表２　出生７年後と１０年後の１日のテレビ及びゲームの合計使用時間別と４年間の身長・体重の変化

	7年後4時間未満 10年後4時間未満	7年後4時間以上 10年後4時間未満	7年後4時間未満 10年後4時間以上	7年後4時間以上 10年後4時間以上	合計	p値
4年後						
身長の増加						
男	16.2cm	16.3cm	16.1cm	16.4cm	16.2cm	ns
標準偏差	3.6	3.8	3.8	3.8	3.7	
(n)	(10467)	(677)	(2133)	(1014)	(14291)	
女	17.4cm	17.6cm	17.7cm	17.8cm	17.3cm	P<0.01
標準偏差	4.2	4.2	4.6	4.2	4.2	
(n)	(11113)	(443)	(1315)	(418)	(13289)	
10年後						
体重の増加						
男	8.9kg	9.6kg	9.6kg	10.0kg	9.1kg	p<0.01
標準偏差	3.6	4.0	4.1	4.4	3.8	
(n)	(10702)	(696)	(2179)	(1039)	(14616)	
女	8.9kg	9.5kg	10.0kg	10.1kg	9.0	p<0.01
標準偏差	3.5	3.9	4.0	4.6	3.7	
(n)	(11361)	(458)	(1350)	(434)	(13603)	

P:一元配置分析

表３　出生７年後と１０年後の１日のテレビ及びゲームの合計使用時間別と登校時の就寝午後 10 時前の割合

	7 年後 4 時間未満 10 年後 4 時間未満	7 年後 4 時間以上 10 年後 4 時間未満	7 年後 4 時間未満 10 年後 4 時間以上	7 年後 4 時間以上 10 年後 4 時間以上	合計	p 値
出生 10 年後 10 時前就寝の割合						
男	73.8%	61.9%	56.9%	51.2%	69.0%	p<0.01
(n)	(12321)	(806)	(2544)	(1247)	(16918)	
女	69.5%	55.7%	52.0%	44.5%	66.4%	P<0.01
(n)	(13021)	(533)	(1579)	(512)	(15645)	

P:カイ二乗検定

表４　出生７年後と１０年後の１日のテレビ及びゲームの合計使用時間別と出生 10 年後家庭内学習時間

	7 年後 4 時間未満 10 年後 4 時間未満	7 年後 4 時間以上 10 年後 4 時間未満	7 年後 4 時間未満 10 年後 4 時間以上	7 年後 4 時間以上 10 年後 4 時間以上	合計	p 値
出生 10 年 後学習時間 男						
1 時間未満	64.4%	68.9%	73.3%	72.8%	66.6%	p<0.01
1- 2 時間	29.7%	25.7%	24.2%	24.3%	28.7%	
2 時間以上	5.8%	5.3%	2.6%	2.9%	5.1%	
(n)	(12339)	(808)	(2250)	(1247)	(16944)	
出生 10 年 後学習時間 女						
1 時間未満	57.5%	58.3%	65.0%	65.1%	58.5%	p<0.01
1- 2 時間	35.8%	34.0%	30.8%	30.8%	35.1%	
2 時間以上	6.7%	7.7%	4.2%	4.1%	6.4%	
(n)	(13042)	(535)	(1578)	(513)	(15668)	

P:カイ二乗検定