

Association between attitudes towards Internet usage and health practices in high-school students in 2 schools in Turkey: a cross-sectional study

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الترابط بين الاتجاهات تجاه استخدام الإنترنت والممارسات الصحية لدى طلاب المرحلة الثانوية في مدرستين في تركيا: دراسة مقطعية
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الخلاصة: يمكن للاستخدام المفرط للإنترنت أن يؤثر تأثيراً سلبياً على الصحة وعلى الممارسات الصحية ولا سيما بين الشباب. لدراسة هذا الموضوع لدى الطلاب في تركيا، تحدد هذه الدراسة الترابط بين اتجاهات طلاب المرحلة الثانوية تجاه استخدام الإنترنت وسلوكهم الصحي. تم اختيار العينة (وعدد أفرادها 2043 طالباً) عشوائياً من بين جميع الطلاب في مدرستين ثانويتين في تركيا: إحداهما في أنطوليا والثانية (وهي مدرسة مهنية) في إسطنبول. وتم جمع البيانات باستخدام استبيان مبني على "مقياس الاتجاهات تجاه استخدام الإنترنت" و"ملف أنماط الحياة لدى المراهقين". كان متوسط أعمار الطلاب 16.3 سنة، وكان 77% منهم ذكوراً، كما كان 96.9% منهم يستخدمون الإنترنت، وكان متوسط مدة استخدامهم للإنترنت 18.8 ساعة أسبوعياً. واتضح أن للطلاب اتجاهات إيجابية أكثر نحو استخدام الإنترنت، وأن متوسط القياسات لسلم قياس الاتجاهات تجاه استخدام الإنترنت (72.58 (الانحراف المعياري 17.64) و 111.34 (الانحراف المعياري 16.61) وهما من المستويات الوسطية. وكانت هناك علاقة سلبية ضعيفة ولكنها ذات أهمية إحصائية بين اتجاهات المراهقين تجاه استخدام الإنترنت وبين سلوكهم الصحي. وتتوافق النتائج التي توصلنا إليها مع نتائج دراسات أجريت في مجتمعات مختلفة وكانت تشير إلى بعض التأثير السلبى للاستخدام المكثف للإنترنت.

ABSTRACT Excessive usage of the Internet can negatively affect health and health practices especially among youth. To examine the issue among Turkish students, this study determined the association between high-school students' attitudes towards Internet usage and their health behaviour. The sample (n = 2043) was randomly drawn from all students at two high schools in Turkey: one in Anatolia and one (a vocational school) in Istanbul. Data were collected using the Structured Questionnaire, Attitude Scale towards Internet Usage (ASTIU) and Adolescent Lifestyle Profile (ALP). The mean age of the students was 16.3 years, 77.7% were male and 96.9% used the Internet; mean duration of Internet use was 18.8 h/week. Female students had more positive attitudes towards Internet usage. Mean scores for ASTIU and ALP were 72.58 (SD 17.64) and 111.34 (SD 16.61) respectively, which were average levels. There was a statistically significant but weak overall negative correlation between adolescents' attitudes towards Internet usage and their health behaviour. Our results concur with studies in different cultures which suggest some negative effects, of heavy Internet use.

Association entre les attitudes à l'égard de l'utilisation d'Internet et les pratiques sanitaires des élèves du secondaire dans deux établissements en Turquie : étude transversale

RÉSUMÉ Une utilisation excessive d'Internet peut nuire à la santé et aux pratiques sanitaires, notamment chez les jeunes. Afin d'étudier la question parmi les élèves turcs, la présente étude a déterminé l'association entre les attitudes des élèves du secondaire à l'égard d'Internet et leurs comportements en matière de santé. L'échantillon (n = 2043) a été constitué de façon aléatoire à partir de l'ensemble des élèves de deux établissements d'enseignement secondaire en Turquie : l'un en Anatolie et l'autre dans une école de formation professionnelle à Istanbul. Les données ont été collectées à partir d'un questionnaire structuré, de l'ASTIU [échelle d'attitude à l'égard de l'utilisation d'Internet] et de l'ALP [profil de mode de vie des adolescents]. L'âge moyen des élèves était 16,3 ans, 77 % étaient des garçons et 96,9 % utilisaient Internet, avec une durée moyenne totale d'utilisation de 18,8 heures par semaine. Les élèves de sexe féminin avaient des comportements plus positifs à l'égard de l'utilisation d'Internet. Les scores moyens pour l'ASTIU et l'ALP étaient de 72,58 (ET 17,64) et 111,34 (ET 16,61) respectivement, qui correspondaient aux scores moyens. Il existait une corrélation négative statistiquement significative, mais assez faible d'un point de vue global, entre les attitudes des adolescents à l'égard de l'utilisation d'Internet et leurs comportements en matière de santé. Nos résultats recourent ceux d'études réalisées dans différentes cultures et qui suggèrent l'existence de certains effets négatifs liés à une utilisation excessive d'Internet.

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Introduction

Internet usage in all fields, such as education, health, communication, transportation, trade and finance, affects the world we live in (1,2). The Internet has become pervasive in the lives of young people and there is evidence that it has a negative effect on academic attainment (drop in grades), family relations (having to hide excessive Internet usage from parents), physical health (sleep deprivation due to long hours of Internet usage), mental health (depression) and finance (cost of accrued Internet expenses) (3).

For high-school students, the Internet is one of the main sources of information and social interaction (4,5). It enables them to access to information, do research and develop skills such as problem solving, creativity and critical thinking. On the other hand, excessive, uncontrolled and unthinking usage can have a negative effect on the development of personal skills and health and health practices (6–8). For example, regular physical activity is essential for a healthy productive life. Modern life, with its cars, televisions, computers and video games, can lead to low levels of physical activity and necessitate deliberate commitment of leisure time to physical activity to gain health benefits (9,10).

Health-risk behaviours are usually adopted in adolescence but their impact may not be felt until adulthood and may lead to a considerable increase in mortality and morbidity. Adolescents are therefore at a critical time in their life for making independent health care decisions; hence health promotion is especially important in this population (11). Health promotion aims to enable individuals to adjust their behaviours to attain a high level of physical and mental health.

As the Internet is an increasingly important resource of information in the lives of young people, it could be a

valuable platform to deliver health interventions to youth populations; however, there is a lack of research in this field (12). This study among Turkish adolescents was therefore conducted to examine students' attitudes to the Internet and their health practices in view of the social norms in Turkey, such as strong family ties (13–15).

The specific aims of this study were to evaluate:

- the attitudes of students towards the Internet usage and their health practices;
- any correlation between Internet usage and students' health practices;
- the effect of sociodemographic and Internet-related characteristics on attitudes towards Internet usage and health practices.

Methods

Study design and sample

This was a cross-sectional study conducted in 2011/12. The study population consisted of all the students enrolled at one Anatolian high school and one vocational high school in Istanbul (total number of students = 3955). Students were selected randomly from each school separately (by drawing names from separate bags for Anatolian and Istanbul students); thus 310 students were selected from the Anatolian high school and 1733 from the vocational high school in Istanbul (Table 1).

We conducted post hoc power analysis using *G*Power 3.1.9.2* program. A significant difference was observed in the ASTIU scores ($z = 3.66, P < 0.001$) between Internet users and non-users (Table 2). The statistical power analysis result for this difference was 0.97.

Data collection

Data were collected by the researchers through face-to-face interviews with the students outside the classroom lessons

using three data collection tools (Structured questionnaire, Attitude Scale towards Internet Usage and Adolescence Lifestyle Scale). The interviews were conducted in Turkish. To reduce social desirability bias, a randomized response technique was used (16,17).

Data collection tools

Structured Questionnaire: It included questions regarding students' age, sex, body mass index (BMI) as measured by the researchers, and computer and Internet usage.

Attitude Scale towards Internet Usage (ASTIU): It was designed by Tavşancıl and Keser to assess attitudes towards Internet usage (18). It consists of 6 sub-dimensions: Usage of Internet in Instruction, Usage of Internet in Research, Usage of Internet in Social Interaction, Enjoyment of Usage of Internet in Instruction, Usage of Internet in Communication and Usage of Internet in Sharing of Knowledge. The 5-point Likert type scale consists of 31 items. The lowest and highest scores are 31 and 155 respectively. The higher the score in all sub-dimensions, the more positive the attitude towards Internet usage (amount and type of Internet use). The internal consistency coefficient for the whole scale was 0.89 (18). In the present study, the internal consistency coefficient was 0.88, indicating ASTIU was a valid assessment tool for our study.

Adolescent Lifestyle Profile (ALP): The ALP is the version of Healthy Lifestyle Profile II developed for adolescents (9). Validity and reliability studies were conducted by Hendricks, Murdaugh and Pender (9), and a Turkish version was adapted by Ardic (10). ALP consists of 40 items and 7 sub-dimensions: health responsibility, physical activity, nutrition, positive life appreciation, interpersonal relations, stress management, and spiritual growth. The lowest and highest scores obtainable are 40 and 160 respectively. The higher the score, the higher the level

Table 1 Distribution of population (N = 3955) and sample (n = 2043)

Institution	Total no. of students (Si)	Sample weight (ai) ^a	No. of students in sample ^b
Anatolian high school	600	0.15	310
Vocational high school	3355	0.85	1733

^a $ai = Si/N$.^b $ai \times n$.

of health practice. The Cronbach alpha coefficient for the whole scale was 0.87, range 0.54 to 0.77 for sub-dimensions (9). For the present study, it was 0.89 for the whole scale, range 0.53 to 0.72 for sub-dimensions. Internal consistency coefficients in our study were similar to Ardiç's (10), thus scale-related values had internal consistency.

Statistical analysis

SPSS 17 for Windows (version 11.0; SPSS Inc., Chicago, IL, USA) was used to analyse the data. Medians, minimum and maximum values and arithmetic means [standard deviation (SD)] were used for ordinal data evaluation. Frequency and percentages were used for nominal data evaluation. The Kolmogorov–Smirnov test was used to determine normality of distributions. As some distributions were abnormal, non-parametric methods were used for the statistical analysis. When comparing qualitative data, the Mann–Whitney U test was used to compare variables between two groups. The Kruskal–Wallis test was used to compare variables with more than two groups. The Bonferroni-adjusted Mann–Whitney test was used to identify the responsible group for the difference with secondary multiple comparison analysis when the differences between the parameters of more than 2 groups were found statistically significant. Spearman correlation analysis was used to determine correlation between scales.

Ethical considerations

Prior to the study, authorized written approval was obtained from the Faculty of Medicine Ethics Committee, Istanbul University Cerrahpaşa

(03.02.2011/8087/C-07) and the Istanbul Provincial Directorate for National Education (02.04.2011/19532). Student participants were informed about the aims and benefits of the study and their roles were explained; all agreed to participate. Their written approval was taken on the consent form. No names were entered on the data collection forms and they were kept separately from the consent form to protect the anonymity of the students.

Results

Students' characteristics

Of the 2043 students included in the study, 1587 (77.7%) were male. The reason for the difference was due to the higher number of male students in the vocational high school. The age of the participants ranged from 14 to 19 years, mean age was 16.3 years; just over half (55.2%) were aged 14–16 years. In addition, 70.4% were at a normal weight in terms of BMI, 68.4% had personal computers and 96.9% used the Internet. The mean duration of Internet use was 18.8 hours per week (SD = 17.0) (Table 2).

Association between sociodemographic & Internet-related characteristics and ASTIU & ALP scores

Sex was significantly associated with ASTIU score; female students had more positive attitudes towards the Internet usage ($P < 0.001$) (Table 2). Age was not significantly associated with either ASTIU or ALP scores ($P > 0.05$) (Table 2).

BMI was significantly associated with ALP scores ($P < 0.05$). The

difference between BMI groups resulted from the differences in scores obtained by normal-weight and overweight students ($\chi^2 = 8.28, P = 0.041$). In line with this finding, the students with normal weight had more positive lifestyle practices compared to overweight students (Table 2).

The students with personal computers had significantly lower ASTIU scores ($P < 0.001$) than those who did not own one. However, the opposite was true for ALP scores with computer-owning students having higher ALP scores ($P < 0.001$). This finding shows that students owing a computer had more negative attitudes towards the Internet usage but reported more positive lifestyle practices than those not owning a personal computer (Table 2).

ASTIU scores of those using the Internet were also significantly lower than those who did not do so ($P < 0.05$), indicating that students using the Internet had more negative attitudes towards the Internet than non-users (Table 2).

ASTIU and ALP scores were associated with weekly duration of Internet usage; the longer the Internet usage of students, the more negative were their attitudes towards Internet usage and the more negative their health practices (Table 2).

ASTIU & ALP scores and correlations between them

The mean (SD) ASTIU score was 72.58 (SD 17.64). For sub-dimensions, the mean (SD) scores were: 17.87 (SD 6.03) for Usage of Internet in Instruction, 16.16 (SD 4.65) for Usage of Internet in Research, 10.44 (SD=4.38) for Usage of Internet in Social Interaction, 10.54 (SD 3.26) for Enjoyment

Table 2 Distribution of students' scores in ASTIU and ALP according to the individual and Internet-related characteristics (n = 2043)

Variable	No. (%)	ASTIU Mean (SD)	ALP Mean (SD)
Sex			
Female	456 (22.3)	76.18 (16.75)	111.08 (14.32)
Male	1587 (77.7)	71.54 (17.75)	111.42 (17.22)
		$z = -5.60, P < 0.001$	$z = -0.36, P = 0.720$
Age groups (years)			
14–16	1127 (55.2)	72.26 (16.88)	111.80 (16.18)
17–19	916 (44.8)	72.97 (18.53)	110.78 (17.12)
		$z = -0.47, P = 0.640$	$z = -0.82, P = 0.413$
Mean (SD), (Min–Max)	16.29 (0.99), (14–19)	$r = 0.134, P = 0.146$	$r = 0.170, P = 0.064$
Body mass index			
< 18.50 (underweight)	337 (16.5)	71.89 (16.95)	110.39 (17.03)
18.50–24.99 (normal)	1439 (70.4)	73.00 (17.59)	111.93 (16.58)
25–29.99 (overweight)	229 (11.2)	71.47 (19.09)	108.85 (16.33)
30 (obese)	38 (1.9)	69.13 (16.23)	112.45 (14.46)
		$\chi^2 = 5.70, P = 0.127$	$\chi^2 = 8.28, P = 0.041$
Owns computer			
Yes	1397 (68.4)	70.52 (17.34)	112.54 (16.42)
No	646 (31.6)	77.02 (17.47)	108.75 (16.74)
		$z = -8.16, P < 0.001$	$z = -4.52, P < 0.001$
Uses the Internet			
Yes	1979 (96.9)	72.31 (17.56)	111.38 (16.60)
No	64 (3.1)	80.77 (18.06)	110.25 (16.98)
		$z = -3.66, P < 0.001$	$z = -0.87, P = 0.385$
Duration of Internet use^a (h/week)			
(Mean (SD), (Min–Max))	18.75 (17.01), (1–93)	$r = -0.198, P < 0.001$	$r = -0.084, P < 0.001$

^aExamined in the 1979 individuals who used the Internet.

$z =$ Mann–Whitney U test; $\chi^2 =$ Kruskal–Wallis test. Statistical significant set at $P < 0.05$.

ASTIU = Attitude Scale towards Internet Usage; ALP = Adolescent Lifestyle Profile; SD = standard deviation.

of Usage of Internet in Instruction, 9.26 (SD 3.35) for Usage of Internet in Communication, and 8.32 (SD 3.57) for Usage of Internet in Sharing of Knowledge. For ALP, the mean (SD) score for the whole scale was 111.34 (SD 16.61). The mean (SD) scores for sub-dimensions were: 10.69 (SD 2.91) for health responsibility, 16.08 (SD 3.76) for physical activity, 15.97 (SD 3.23) for nutrition, 24.38 (SD 4.35) for positive life appreciation, 15.54 (SD 2.89) for interpersonal relations, 14.68 (SD 2.70) for stress management, and 13.99 (SD 2.92) for spiritual growth (Table 3).

While there was no correlation between students' attitudes towards the Internet usage and health responsibility, a very weak negative correlation was found between students' attitudes towards Internet usage and physical activity, nutrition, positive outlook on life, interpersonal relations, stress management, spiritual growth and general lifestyle practices (Table 4).

Discussion

Overall, we found a very weak negative association between attitudes towards the Internet usage and adolescents' health practices.

With regard to students' individual characteristics and Internet usage, we found that the majority of participants used both computers and the Internet, and more than half of them had their own personal computer. Similarly, a study conducted by Cömert and Kayıran among children and adolescents showed that 35.7% of the families had a computer in their homes and 21.7% had Internet access (19). Given the fact that the Internet facilitates access to information, the high access shown in our study is overall a positive finding because students can easily benefit from the opportunities afforded by the Internet.

Table 3 Distribution of students' scores from the Attitude Scale towards Internet Usage (ASTIU) and Adolescent Lifestyle Profile (ALP) scales (n = 2043)

Scale	Potential range	Minimum	Maximum	Median	Mean (SD)
ASTIU					
Usage of the Internet in instruction	8–40	8	40	17	17.87 (6.03)
Usage of the Internet in research	7–35	7	35	16	16.16 (4.65)
Usage of the Internet in social interaction	4–20	4	20	10	10.44 (4.38)
Enjoyment from usage of the Internet in instruction	4–20	4	20	10	10.54 (3.26)
Usage of the Internet in communication	4–20	4	20	9	9.26 (3.35)
Usage of the Internet in sharing of knowledge	4–20	4	20	8	8.32 (3.57)
Total	31–155	31	148	72	72.58 (17.64)
ALP					
Health responsibility	5–20	5	20	10	10.69 (2.91)
Physical activity	6–24	6	24	16	16.08 (3.76)
Nutrition	6–24	6	24	16	15.97 (3.23)
Positive life appreciation	8–32	8	32	25	24.38 (4.35)
Interpersonal relations	5–20	5	20	16	15.54 (2.89)
Stress management	5–20	5	20	15	14.68 (2.70)
Spiritual growth	5–20	5	20	14	13.99 (2.92)
Total	40–160	40	160	111	111.34 (16.61)

SD = standard deviation.

In the current study, significant sex differences in Internet usage were observed; male students used the Internet more than females. Other studies have shown sex differences in amount and type of Internet use, but not consistently for one sex or the other (20–22). Macharia & Nyakwende found that female university students in Kenya reported greater use of the Internet for study purposes than males (20). Similarly, a study conducted among high school students in Turkey reported that female students spent more time than male students on the Internet (6). However, a study in Australia observed that male adolescent students spent more time on the Internet than their female counterparts (21). Males in the United States of America were reported to use the Internet mainly for purposes related to entertainment and leisure whereas women used it primarily for interpersonal communication and educational assistance (22).

The correlation between the duration of the Internet use and ASTIU and ALP scores showed that longer Internet usage was associated with more negative attitudes towards its use and poorer health practices. Several studies confirm the negative effects of Internet use on health practices if it is used for extended periods of time. A study among students in Hong Kong reported that heavy Internet users were much less likely than others to engage in health-promoting behaviours such as attempting to eat a healthier diet, taking nutritional supplements and trying to increase physical activity levels (23). In a study among Turkish high-school students, Kelleci et al. showed that Internet usage in excess of 2 hours a day led to mental health disorders (6). Among a sample of adults (median age of 20 years), higher levels of computer usage were associated with both lower physical activity levels and perception of computer usage as a barrier to physical activity (24). Moreover, Morgan and Cotton, and Yang et al. suggested that excessive use

of the Internet caused students to deviate from the real life and fail to cope with difficulties they encounter (25,26). Participants of a study conducted by Rotunda et al. reported certain negative outcomes of Internet usage and that problematic practices, which were less prevalent, became more common (27).

The students' ASTIU scale total score was at a medium level (mean 72.58 in a range of 31–155). Also Internet Usage in Instruction was the sub-dimension on which students got the highest scores. A study among adolescents in Lebanon indicated that 84.2% the Internet usage was for communication and messaging, 65.7% for information and research, 51.8% for entertainment such as gaming, 51.2% for music and movies, and 4.6% for other purposes (28). Thanks to its interactive nature, the Internet contributes to education and provides resources and materials in almost every field that can be used directly in the classroom. Furthermore, students in this information

Table 4 Correlation between students' scores on the Attitude Scale towards Internet Usage (ASTIU) and Adolescent Lifestyle Profile (ALP) scales (n = 2043)

ALP	ASTIU							Total
	Usage of the Internet in instruction	Usage of the Internet in research	Usage of the Internet in social interaction	Enjoyment from usage of the Internet in instruction	Usage of the Internet in communication	Usage of the Internet in sharing of knowledge		
Health responsibility								
r ^a	-0.080**	0.070**	-0.048*	0.016	0.091**	0.017	0.003	
p ^b	< 0.001	0.002	0.028	0.477	< 0.001	0.435	0.901	
Physical activity								
r ^a	-0.178**	-0.089**	-0.160**	-0.134**	-0.071**	-0.147**	-0.192**	
p ^b	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	
Nutrition								
r ^a	-0.107**	-0.033	-0.043	-0.049*	0.011	-0.069**	-0.077**	
p ^b	< 0.001	0.139	0.053	0.027	0.617	0.002	0.001	
Positive life appreciation								
r ^a	-0.158**	-0.157**	-0.057**	-0.095**	-0.141**	-0.182**	-0.191**	
p ^b	< 0.001	< 0.001	0.010	< 0.001	< 0.001	< 0.001	< 0.001	
Interpersonal relations								
r ^a	-0.137**	-0.164**	-0.040	-0.055*	-0.138**	-0.158**	-0.168**	
p ^b	< 0.001	< 0.001	0.069	0.013	< 0.001	< 0.001	< 0.001	
Stress management								
r ^a	-0.155**	-0.119**	-0.038	-0.086**	-0.109**	-0.121**	-0.155**	
p ^b	< 0.001	< 0.001	0.085	< 0.001	< 0.001	< 0.001	< 0.001	
Spiritual growth								
r ^a	-0.152**	-0.076**	-0.130**	-0.106**	-0.074**	-0.153**	-0.169**	
p ^b	< 0.001	0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	
Total								
r ^a	-0.192**	-0.117**	-0.104**	-0.104**	-0.090**	-0.166**	-0.192**	
p ^b	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	

*Correlation significant at the 0.05 level (2-tailed).

**Correlation significant at the 0.01 level (2-tailed).

r^a = Spearman correlation.

p^b = Correlation significant at the 0.05 and 0.01 level (2-tailed).

age are expected to self-learn through various resources, including the Internet, and be able to analyse and use information accessed. Using the Internet in a healthy and conscious fashion facilitates learning performance and enables adolescents to acquire and benefit from a variety of skills such as selecting collecting and categorizing information (19,29).

The total score on the ALP scale was at a medium level (mean 111.34 in a range of 40–160). On the other hand “positive life appreciation” was the sub-dimension on which students got the highest scores. Scores for positive life appreciation indicate the level of adopting a positive view on life and having positive thoughts. It can be said that if young people have a positive outlook on life, it is a desirable outcome for their future in terms of adopting and maintaining positive health practices (10).

We observed that as students’ AS-TIU scores increased, physical activity, nutrition, positive outlook on life, stress management, spiritual growth and general lifestyle practices became more negative. A previous study in Turkey

revealed that children and youngsters who spend a lot of time on the Internet become more and more isolated and experience difficulties in establishing face-to-face interactions (30). Other studies in the United States and Australia reported that excessive usage of the Internet could cause considerable problems in daily practices, interpersonal relations and business, and that some students could not establish close relationships with their friends due to the Internet usage (31,32). Clark et al. confirmed that students who constantly use the Internet develop eyestrain, headache and pain in their neck and wrists in time and women exhibit more physical symptoms compared to men (33).

A main limitation to our study is that it was conducted in only 2 schools in Turkey and the sample may not be representative of schools across Turkey; hence the results may not be generalized to a wider population.

Conclusion

This current study was conducted to determine the effects of high school

students’ attitudes towards the Internet usage on their health practices. Weak negative correlations were found between students’ attitude towards the Internet usage and physical activity, nutrition, positive outlook on life, interpersonal relations, stress management, spiritual growth, and general lifestyle practices. Thus it may be said that Internet use appears to have little effect on students’ health practices. However, while showing weak effects, our results are similar to studies in different cultures which suggest some negative effect of heavy Internet use; some control of the heavy usage of the Internet may be warranted.

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