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Dog walking during the lockdown in the Covid-19 pandemic situation in the Czech Republic: a questionnaire survey

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ABSTRACT

This study aimed to compare the frequency, duration, and location of dog walking during and before the first Covid-19 lockdown (LD) and possible variable factors. The research team interviewed 504 adult Czech dog owners using an online questionnaire regarding their dog walking activity. During the LD in April 2020, the frequency of dog walking was significantly lower, and a single walk duration was significantly higher than before ($p < 0.001$). The preference for locations also changed during the LD. Dog walking was considered beneficial for physical activity (PA) and daily rhythm. Factors related to dog walking frequency during the LD were age ($p = 0.016$) and the length of working/studying hours ($p < 0.001$). These factors were significant before and during the LD: the number of children ($p < 0.001$), the number of household members ($p = 0.044$), and the type of housing ($p = 0.006$). This study brings a broad amount of data on current trends and changes in dog walking during the unprecedented lockdown, which might contribute to the organisation of public health or research methodology in future relatable situations.

KEYWORDS

companion animal; physical activity; lockdown; public health; leisure

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INTRODUCTION

The Covid-19 epidemiological situation caused many effects, such as unusual sadness, fear, frustration, helplessness, loneliness, and nervousness because of spatial distanc-

ing, self-isolation, quarantine, social and economic discord, and misinformation (Sakib et al., 2020; Shah et al., 2020). For many, the Covid-19 situation has represented tremendous psychological pressure, disturbance (Li et al., 2020; Wang et al., 2020), and mental distress (Khan et al., 2022).

Another change in this unfavourable epidemiological situation was the closure of workplaces and schools. People had to learn to work from home and still be helpful to the children in their education. This change was unprecedented, and home-schooling has significantly stressed families worldwide. As of 9 April 2020, families were educating 1.57 billion children without previous experience of protracted home-schooling (O'Sullivan et al., 2020).

Decreased overall physical and mental well-being while working from home was associated with changes in physical exercise, food intake, communication with co-workers, children at home, distractions while working, adjusted work hours, workstation set-up, and satisfaction with workspace indoor environmental factors (Xiao et al., 2021). On the other hand, a Swedish study has reported a positive outcome of working from home – increasing sleep time, which is beneficial. Interestingly, sedentary, standing, and moving behaviours did not change markedly when working from home compared to working at the office (Hallman et al., 2021).

Children, partners, and non-human family members engage in the daily routine. Some respondents reported obstacles like interruptions of video conferencing by the barking of dogs, unexpected snuggling of a cat and its interest in the computer monitor, or other distractions while working from home for various reasons (Delanoeije, 2020). On the one hand, contemporary literature aims at possible problems connected with pet ownership, e.g., the postponement of animal owners' testing caused by the anxiety of the animal staying alone (Applebaum, Adams et al., 2020) or an inability to provide the animal with sufficient movement, stimuli, social ties, and material stuff (Applebaum, Tomlinson et al., 2020). On the other, articles have been published describing that the presence of a pet and touching it may assist in promoting health and well-being when human contact is limited (Young et al., 2020). As Shoesmith et al., (2021) have reported, companion animals constitute a reliable source of support, providing unconditional love, affection, and companionship. Companion animals were frequently perceived as being able to enhance mood, reduce stress, and help participants to cope generally with the Covid-19 lockdown phase. The constant source of companionship appeared to ameliorate feelings of loneliness – particularly for those living alone or those who lived with workers who frequently worked outside of the home (Shoesmith et al., 2021).

In the same study, many participants commented that animal ownership encouraged and promoted physical activity (PA). Animals appeared to enhance mobility, increase exercise participation and promote contact with nature, especially for owners of dogs and horses. However, their study did not prove this phenomenon numerically or even statistically (Shoesmith et al., 2021).

Many previous studies have shown a positive influence of dog ownership on human PA and the extent of movement through dog walking (Coleman et al., 2008; Cutt et al., 2008; Ham & Epping, 2006; Hoerster et al., 2011). Numerous studies have proven that PA improves physical (Powell et al., 2011) and mental health (White et al., 2017). When all sports centres were closed, and sports could only be performed individually,

the increase in the length and frequency of walking seemed to be a good option for regular and much-needed physical activity. Furthermore, this could also be important for maintaining mental balance for many people.

Moreover, at the time of the lockdown (LD) and related restrictions, it was recommended that people go out in nature, and walking pets was one of the few activities allowed. Therefore, this study aimed to map whether the time spent walking dogs, the frequency of this activity, and the location of dog walks changed compared to the time before Covid-19. It was assumed that factors such as compulsory working from home, changes in working hours, and the number of people living in the household would increase the frequency and duration of dog walking time and influence the location of dog walking.

MATERIALS AND METHODS

Participants

There were 504 adults enrolled in this study. All the participants were dog owners. The study was conducted 29–36 days after starting the first LD declaration in the Czech Republic in the spring of 2020. The sample consisted of 448 women and 56 men. All the respondents were Czech, spending the lockdown (LD) in the Czech Republic.

The inclusion criteria included dog ownership, ability and willingness to complete the required online questionnaire, and permission to share required data through online informed consent. Demographic data of the whole group (N = 504) are presented in Table 1.

At the time of the lockdown, almost half of the respondents stated that they worked or studied from home, 22.8% of respondents went to work or school as before the lockdown, and 11% worked alternately from home and their office (place of work). During the LD, 40% of respondents reported working 1–4 hours a day, 31.3% working 4–8 hours a day, 22.8% working 8–12 hours a day, and 5.6% stated that they worked more than 12 hours a day. 48.8% of respondents stated they worked less during the lockdown than before, while 15% of respondents claimed that they, conversely, worked more during the lockdown than before, and for 36% of respondents, the length of work hours did not change.

6% of respondents stated that their dog was in the age of a puppy (2–4 months), 17.9% of respondents had a junior dog (4 months to 1 year), 60.7% of respondents had an adult dog (1–7 years), and 16.1% owned a senior dog (> 7 years). 79.8% considered their dogs completely obedient, 12.7% did canine sports, and 7.5% found their dogs disobedient. 30.2% of respondents cared for the dog personally, whereas the remaining 70% shared care with other household members. This situation did not change.

General procedures

Data were collected during one week in April 2020 in the Czech Republic. The questionnaire design was based on study hypotheses, which were formulated in such a way that allowed testing their validity through information gathered through the questionnaire. Before conducting the study, a pilot questionnaire was created to attest to the intelligibility and comprehensibility of the questionnaire (40 respondents were included in the pilot study). Based on the findings of the pilot questionnaire survey, partial

Table 1 Summary of the demographic data obtained in the questionnaire

Demographic category		n	%
Gender	Male	56	11.11
	Female	448	88.88
Age category	20–29 years	264	52.38
	30–44 years	150	29.76
	45–60 years	264	52.38
Size of a place of residence (population)	Village	171	34.00
	Town (less than 1000 inhabitants)	10	2.00
	Town (1000–29000 inhabitants)	131	26.60
	Town (30 000–100 000 inhabitants)	50	10.00
	City (more than 100 000 inhabitants)	133	26.40
Residence type	Apartment	224	44.40
	Family house	280	55.50
Household composition	Living with spouse and children	252	50.00
	Living with parents	176	35.00
	Living alone	57	11.30
	Other (with roommates, siblings)	161	3.20
Number of children	None	341	67.70
	One	67	13.30
	Two	126	25.00
	Three	16	3.20
	Four	3	0.60
Number of people in a shared household	One person	185	36.70
	Two people	111	22.00
	Three people	91	18.00
	Four people	31	6.20
	Five people	35	6.90
Employment type	Full-time contract	307	61.00
	Part-time contract	71	14.00
	Students without employment	85	16.80
	Unemployed or retired	23	4.50

adjustments to questions and answers were made. Participants signed informed consent (data anonymity, consent to use, process, and store the data). The questionnaire was filled in and distributed via social networks due to restrictions on social contact. Unfortunately, this fact affected the age structure of the respondents. The time provid-

ed for completing the questionnaire was 10 minutes, so the respondents had enough time to review all questions. Incomplete questionnaires were not sent for evaluation.

At the beginning of the online questionnaire, the study was presented, and information was provided that by continuing to fill in the questionnaire, informed consent was provided for the use of the obtained data for a scientific publication. The data set is securely stored in a locked box at the Czech University of Life Sciences. The testing procedures described herein were carried out according to the ethical standards of the Ethical Committee of Lincoln University, UK, and the Declaration of Helsinki, as the latest amendment. The study was approved by the Institutional Review Board of the Czech University of Life Sciences (CULS) in Prague, and all experiments were performed under relevant guidelines and regulations.

Questionnaire

The questionnaire contained a set of 42 questions. Respondents provided demographic data, such as age, gender, nationality, and population size, in the place of permanent residence. Further, the respondents stated whether they lived in a family house or an apartment, whether they had children (and how many), and with whom they shared a household (the number of people). Respondents also answered questions concerning their dogs. Among other things, they stated its age and subjective level of training and evaluated its character. Some questions focused on the work or study. Respondents answered whether they worked full-time or part-time, were unemployed, or were students. Further, the questions focused on the work contract intensity and the possibility of working from home or home-schooling in the case of students.

The second part of the questionnaire was focused on dog walking. The respondents stated the frequency and duration of dog-walking at the time and before the LD. They specified a location of dog walking before and during the LD, whether they walked alone or with someone from their household. Also, they described who took care of the dog before and during the LD. Respondents also described their personal gain from walking the dog outside and, on the contrary, their concerns. Within their answers, they also assessed the perceived value of the dog at the time of LD.

All the questions were related to the particular respondent and the information about the frequency or length of dog walking they perform daily, not the frequency and length of the dog's daily walks.

Data analysis

In addition to descriptive statistics, selected methods of statistical induction were also used to analyse the primary data. Before the statistical analysis, exploratory data analysis was executed to verify assumptions for subsequent statistical processing (which were the independence or dependence of the samples, homogeneity, and normality of the distribution).

The Wilcoxon non-parametric test of two independent samples was performed to assess and verify the statistically significant changes in the frequency and duration of dog walking before and during the LD. This was due to the discontinuity of the examined statistical feature and its ordinal character.

The significance of the presumed factors affecting the frequency and duration of dog walking before and during the LD was tested with contingency tables using

Pearson's χ^2-test ("chi-square test"). In some cases, it was necessary to merge adjacent categories with regard to meeting the conditions for utilising the χ^2-test (see different DF). If the qualitative characteristics' statistically significant correlation was demonstrated, this dependency's strength was evaluated based on Pearson's contingency coefficient (C).

Statistical significance was set at $p < 0.05$. The statistical analysis results were visualised using box plots and frequency graphs. All data were analysed using STATISTICA (StatSoft, Tulsa, USA, version 13.5.017).

RESULTS

The frequency of dog walking before and during the lockdown

The results showed that during the lockdown (LD), the frequency of dog walking was significantly lower than the frequency of dog walking before the LD ($p < 0.001$) (see Fig 1). The highest frequency of dog walking before LD was stated as three times (32.5% of respondents) and four times a day (31.1%) before the LD. At the time of the lockdown, 62.1% of respondents stated that they walked the dog only once a day (compared to 16.4% of respondents before the LD), and 32.9% of respondents walked the dog four times a day (see Table 2). The results show that there was a reduced frequency of walking in most cases.

Table 2 Frequency of walking the dog before and during the lockdown (N = 504)

Dog walking frequency	before LD		during LD	
	N	%	N	%
0	19	3.7	23	4.5
1	83	16.5	313	62.1
2	81	16.1	1	0.2
3	164	32.5	1	0.2
4	157	31.2	166	32.9

In 40.9% of respondents, the frequency of walking the dog did not change. In 11,5% of respondents, there was an increase in the frequency of dog walking. In 47.6%, the frequency of dog walking decreased. An increase of one dog walk per day was noted in 7.3% of respondents; a further higher increase occurred only minimally. On the other hand, a decrease of one dog walk per day was recorded in 15.7%, by two dog walks per day in 26.2% of respondents, and by three dog walks per day in 7.1% of respondents.

The duration of an average single dog walk before and during the lockdown

On the contrary, the average dog walking time increased during the LD ($p < 0.001$). Of the options offered, the most frequently stated duration of a dog walk before the LD was 30 minutes (29.5%), 60 minutes (23.2%), and 20 minutes (22.2%). At the time of the LD, 25.6% of respondents claimed they were occupied with dog walking for 30 minutes, 25.4% for 60 minutes, and 21.2% for 90 minutes (Fig. 2). The most sig-

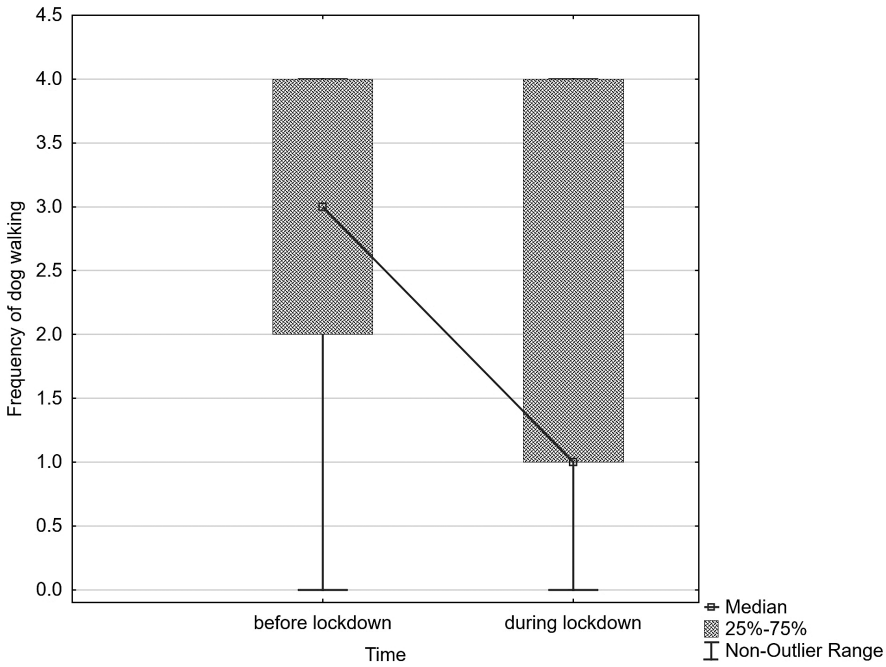

Figure 1 Boxplot comparing the frequency of dog walking before and during the lockdown

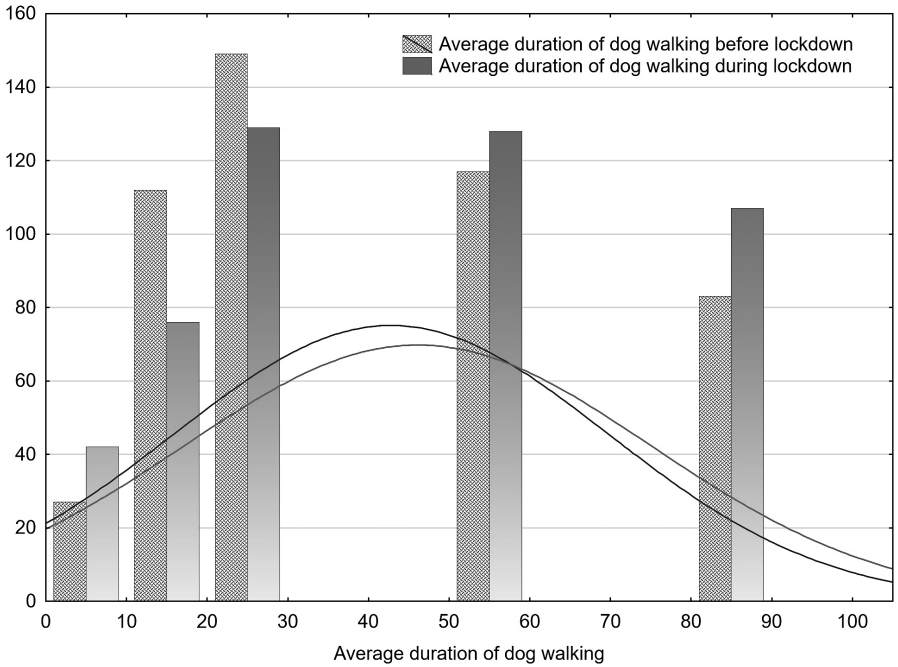

Figure 2 Histogram of average duration of dog walking, categorised by Time

nificant changes in the duration of dog walking were an increase of 30 minutes per 1 dog walk in 14% of respondents and by 10 minutes in 5.7% of respondents. Conversely, a decrease of 30 minutes was observed in 4.5% of respondents, and a decrease of 10 minutes was observed in 4.5%. In general, the duration of dog walking increased in 26.8% of respondents and decreased in 16.7%. For 57.5% of respondents, the duration of dog walking did not change.

The place of dog walking before and during the lockdown

Before the LD, 15.9% of respondents walked their dogs on the streets in front of their houses, 31% of respondents walked their dogs in a park, 25% in a forest, and 26.5% in a meadow. 1.5% of respondents walked their dogs in their gardens.

At the time of the lockdown, respondents walked their dogs less in parks (18.9%) and, on the contrary, more in a forest (31.06%). 20% of respondents walked their dogs in a meadow. The number of respondents who walked the dog in their garden increased to 5.3%. During LD, 24.2% walked their dogs on the streets in front of their house. The most significant change, therefore, occurred precisely in the increase of dog walking in the immediate vicinity. This means compliance with restrictive measures when regulations impose movement in the immediate vicinity. This finding is interesting, given the increased length of individual walks. So, it seems the respondents moved outside for an extended period but to the nearest location.

Perception of the importance of dog walking during LD

When assessing the personal value of the dog to the respondent before the LD, 96% chose values 4 (10.1%) and 5 (86.7%) on a 1–5-point scale, where 1 represented the lowest and 5 the highest importance. During the LD, a value of 5 was chosen by 88.8% of respondents. The respondents claimed that their dogs' presence provided them with distraction (5–43.7%) and social contact (5–30.5%) and reduced the feeling of loneliness (5–40.5%). By contrast, they stated much less often that the dog reduced their potential feelings of anxiety (5–17.5%) or sadness (5–20.6%). The lowest effect of the dog's presence on the feeling of anxiety was reported by 26.6% of respondents, and the feeling of sadness was reported by 28%. 81.5 % of respondents stated they did not feel worried about getting infected with Covid-19 while walking the dog.

When assessing whether the possibility of taking the dog out allows them to take a break from work/classes at home, 31.3% of respondents selected the highest value 5, and 14.6%, the value 4 on a 1–5-point scale. 22.8% of respondents chose the lowest rating of 1 point. Most respondents (37.9%) evaluated walking the dog as a means to get some space from the other household members as the lowest point. 26% of respondents rated this item 4 or 5 points.

To the respondents, the opportunity to get some physical activity on the walks seemed to be the most significant benefit of dog walking. The highest value was rated by 53% of respondents and 4 points by 10% of respondents. 28% of respondents selected the value 3, while the values 1 and 2 were chosen by 8.9%. This was also connected to the possibility of maintaining a regular daily rhythm. In this case, value 5 was rated by 36.9% of respondents, value 4 by another 14.5%, value 3 was selected by 29.6%, and value 1 was chosen by 7.1%.

Factors influencing the frequency and duration of dog walking before and during the LD

The factors of dog walking frequency-age category

The age of respondents turned out to be an essential factor influencing the frequency of dog walking during the LD ($p = 0.016$), which did not seem significant before ($p = 0.232$). A detailed percentage representation of individual walking frequencies in different age categories before and during LD can be found in Table 3.

Table 3 The relation between the age category of dog owners and the frequency of dog walking before and during the LD

Dog walking frequency		Age category 20–29		Age category 30–44		Age category 45–65		All categories 20–65	
		Before LD	During LD	Before LD	During LD	Before LD	During LD	Before LD	During LD
0	n	7	7	8	10	4	6	19	23
	%	2.65%	2.66%	5.33%	6.67%	4.44%	6.67%	3.77%	4.56%
1	n	47	177	26	92	10	44	83	313
	%	17.80%	67.05%	17.33%	61.33%	11.11%	48.89%	16.47%	62.10%
2	n	404	0	26	1	15	0	81	1
	%	15.15%	00.00%	17.33%	0.67%	16.67%	00.00%	16.07%	0.20%
3	n	93	1	48	0	23	0	164	1
	%	35.23%	0.38%	32%	00.00%	25.56%	00.00%	32.54%	0.20%
4	n	77	79	42	47	38	40	157	166
	%	29.17%	29.92%	28%	31.33%	42.22%	44.44%	31.15%	32.94%
Total n		264	264	150	150	90	90	504	504

The factors of dog walking frequency-the length of working hours or school hours

The length of working hours or school hours was, too, a significant factor at the time of the pandemic ($p < 0.001$), which was not significant before ($p = 0.367$). The respondents who worked or studied a maximum of 4 hours a day most often walked dogs before the LD three times a day (29.56%), and 16.75% of respondents walked dogs once a day. At the time of the LD, 67.92% of these respondents walked dogs once daily and 25.16% at least twice daily, respectively.

Among the people working or studying 4–8 hours a day, they, before the LD, mostly walked the dog three times a day (34.81%), four times a day (24.05%), and once a day (19.6%). At the time of the LD, 72.39% of respondents walked dogs once daily, and 26.99% walked twice or more often.

The respondents working or studying 8–12 hours a day most often walked dogs three times a day (37.39%) before the LD; four dog walks a day were taken by 31.3% of respondents. Conversely, 10.71% of respondents in this group walked dogs once a day. A significant difference occurred during the LD when 17.71% of respondents

walked dogs once a day and 77.08% of respondents walked dogs twice or more often, contrasting with other groups working or studying fewer hours daily.

The factors of dog walking frequency-household type and the population in the place of permanent residence

A significant factor before and during the lockdown was whether the respondent lived in a house or an apartment ($p = 0.006$). This factor was significant even before the LD ($p < 0.001$). The same phenomenon was also observed regarding the number of children in the family. This, too, was significant before the LD ($p < 0.001$), just as during the LD ($p < 0.001$). A similar situation was also noted for the number of people in a shared household (before the LD $p = 0.002$; during the LD $p = 0.044$).

On the other hand, the size of the population in the place of permanent residence was significant before the LD ($p < 0.001$) but was not significant during the LD ($p = 0.267$). Before the LD, 24.71% of respondents living in towns with fewer than 1000 inhabitants walked dogs once a day, while only 8.25% of respondents from cities with more than 100,000 inhabitants did. At the time of the LD, one dog walking a day was taken by 59.14% of respondents from smaller towns (< 1000 inhabitants) and by 63.91% of respondents from large cities (> 100 000 inhabitants). Three dog walks a day were taken by 18.39% of residents of smaller towns and by 54.98% of residents from large cities. 29% of small towns' and large cities' residents walked dogs four times a day. Then, at the time of the LD, 33.34% of small-town residents and 34.59% of large-city residents walked dogs more than twice daily.

The same was accurate when it came to with whom the respondents shared a household, which was a significant factor before the LD ($p = 0.002$) but was no longer significant during the LD ($p = 0.561$).

People who were living alone mostly walked their dogs four times a day (28.22%). Slightly less (27.6%) were those who did it once a day and the same those who walked it twice (27.6%), followed by three times a day (15.95%).

People who lived with their parents or siblings walked dogs once daily (6.6%) and most often walked dogs thrice (56.95%). On the contrary, the people who shared a household with their partner walked dogs the most often, i.e., four times a day (51.05%). At the time of the LD, all respondents walked dogs more or less similarly often – approximately 60% from all groups (living alone, living with parents or siblings, living with partners) walked dogs once a day.

Table 4 summarises significant and non-significant factors concerning the frequency of dow walking before and during the LD.

The factors of dog walk duration

As described in Table 5, factors that affected the duration of dog walking time in the LD were the size of the population in the place of permanent residence ($p = 0.009$) and whether the respondent lived in a house or an apartment ($p < 0.001$). These factors influenced the duration of dog walking time even before the LD, with $p < 0.001$ in both cases. The respondent's age was shown to be a significant factor only before the LD ($p = 0.034$) but did not affect the duration of dog walking in the LD ($p = 0.326$).

Table 4 The factors influencing the frequency of dog walking before and during the LD

Considered factors	Before the lockdown			During the lockdown		
	p	DF	C	p	DF	C
15. Age group	0.232	8	x	**0.016**	4	0.154
16. Gender	0.568	4	x	0.631	2	x
17. Size of the population in their place of permanent residence	**< 0.001**	8	0.349	0.267	6	x
18. Living in a house or a flat	**< 0.001**	4	0.420	**0.006**	2	0.141
19. Number of children	**< 0.001**	12	0.708	**< 0.001**	6	0.581
20. With whom they shared a household	**< 0.001**	8	0.486	0.561	4	x
21. Number of people in a shared household	**0.002**	15	0.255	**0.044**	8	0.175
25. Length of working hours or school hours	0.367	12	x	**< 0.001**	6	0.439
26. How their working habits changed during the lockdown compared to a normal state	0.677	8	x	0.868	4	x

Table 5 The factors influencing the duration of dog walking before and during the LD

Considered factors	Before the lockdown			During the lockdown		
	p	DF	C	p	DF	C
15. Age group	**0.034**	10	0.193	0.326	10	x
16. Gender	0.129	5	x	0.371	5	x
17. Size of the population in their place of permanent residence – city or village	**< 0.001**	15	0.273	**0.009**	12	0.224
18. Living in a house or a flat	**< 0.001**	5	0.213	**< 0.001**	5	0.295
20. With whom they shared a household	0.620	8	x	0.945	8	x
21. Number of people in a shared household	0.670	16	x	0.934	20	x
24. Type of working time	0.788	12	x	0.422	15	x
25. How many hours a day they worked or studied	0.794	15	x	0.471	15	x
26. How their working habits changed during the lockdown compared to a state	0.676	10	x	0.159	10	x

In the age group of 20–29 years, respondents most often walked dogs for 30 minutes (35.23%). Further, 21.21% of respondents walked dogs for one hour before the LD. Contrarily, at the time of the LD, the number of respondents who walked dogs for 30 minutes decreased (27.65%), while the number of people who walked their dogs for 60 minutes increased (26.52%). In the category of people who were 30–44 years old, respondents most often walked dogs for 20 minutes a day (29.33%), and the second most stated time length was 60 minutes (24%) before the LD. During the LD, the dog walking most often took 60 minutes (22.67%), and the second most reported

value was 90 minutes (21.33%). In the group of 45–65-year-old respondents, 60 minutes was the most frequently stated length of dog walking time (27.78%) before the LD, which did not differ significantly during the LD (26.67%). The second most reported time was 30 minutes (26.67%) before the LD, which became the most often reported time length during the LD (28.89%). Interestingly, of the groups examined, this was the group of respondents that walked dogs for 90 minutes the most often (18.89%), and even at the time of the LD, this remained very common (20%). These results are visualised in Table 6.

Table 6 The duration of dog walking before and during the LD sorted by age categories

Age of respondents	20–29		30–44		45–65	
	Before LD	During LD	Before LD	During LD	Before LD	During LD
Minutes per walking						
10	6.44	8.71	4.67	10.00	3.33	4.44
20	19.32	12.50	29.33	19.33	18.89	15.56
30	35.23	27.65	21.33	20.00	26.67	28.89
60	21.21	26.52	24.00	22.67	27.78	26.67
90	16.29	21.59	15.33	21.33	18.89	20.00

DISCUSSION

Previous studies about dog ownership during Covid-19 focused mainly on psychological factors (i.e., pets as support for a human in quarantine) and dog well-being. This study aimed to determine if the frequency, time, and place of dog walking in the lockdown (LD) changed compared to before the Covid-19 pandemic restrictions. This information is vital in the context of globally decreased physical activity and the overall health of humans and dogs. We also looked for factors influencing dog walking behaviour in the LD situation.

The main finding of our study is that dog walking behaviour changed during the LD – the frequency of walks was significantly lower, and the duration was significantly higher. In our study, respondents most often walked the dog three times per day before the LD, and most respondents walked it only once a day during the LD. The study of (Bowen et al., 2020), describing the influence of the lockdown in Spain on humans, pets, and their relationships, also presented a decrease in dog walking frequency, though non-significant. Before the LD, dogs went on an average of 3 walks per day (SD = 1.14) compared to 2.5 walks per day during the LD (SD = 1.19). This is significantly more than at the time of the LD in the Czech Republic. In the study of (Owczarczak-Garstecka et al., 2021), a decrease in the dog walking frequency was also observed, in this case significant. Their study evaluated the number of walks per week, where the number changed from 10 to 7 walks per week, and it is possible to consider that it was one walk each day. Also, the results of the study of (Christley et al., 2021) showed that during the LD, dogs were typically walked less often and for

shorter time daily, with factors related to the dog, owner, household, and location of the home being associated with the extent to which dog walking had been reduced.

The authors of some studies state that dog owners in the pre-Covid-19 pandemic times had more physical activity than people who did not have a dog. The reason for higher physical activity was walking the dog (Brown & Rhodes, 2006; Coleman et al., 2008; Cutt, Giles-Corti, & Knuiman, 2008; Garcia et al., 2015). In future studies, it would be appropriate to measure physical activity using, for example, the IPAQ questionnaire or an accelerometer and compare its volume before the pandemic and during the lockdown in a group of dog owners. This would make it possible to evaluate how the increase in the length of individual walks, but their lower frequency, was reflected in this variable. It would also be possible to compare the physical activity of dog owners and people who do not own dogs and find out whether the higher physical activity of dog owners lasted even during the lockdown. Another exciting finding would be how this might affect the welfare of dogs.

Interestingly, although half of the respondents in our study worked less during the LD than before, the frequency of walks did not increase, as might be expected, due to sufficient free time and the possibility of getting some fresh air, but on the contrary, it decreased. As 81.5% of respondents stated they did not feel worried about getting infected with Covid-19 while walking the dog, this reduction in the frequency of going out seems to reflect respect for the measures in place with an emphasis on the maximum limit of outdoor time. In many cases, the most common frequency was one walk per day. On the other hand, respondents who worked 8–12 hours a day very often walked their dogs 4 times a day, and the frequency of their dog walks did not change during the LD. Regarding age, it is also interesting that the highest frequency of dog walks remained unchanged in the age category of 20–30 years; in the other categories, it even increased.

In the study of (Bowen et al., 2020), the authors reported a reduced duration of dog walks, contrary to our results. However, it is not easy to compare the results of their study with the results obtained by us because, in their study, the total time the dog spends outside in one day is taken into account, while in our study, it was the time devoted to one walk. Another possible difference is whether the research focused on the dog's time walking (Owczarczak-Garstecka et al., 2021). In such a case, several people can go out with one dog. Our study was about the time and frequency of dog walking carried out by the given respondent.

Nevertheless, it is evident that in the study of (Bowen et al., 2020), there was an almost sevenfold increase in walking time of fewer than 30 minutes a day (before the LD – 7.9%; during the LD – 49.7%). In the study of (Owczarczak-Garstecka et al., 2021), a comparison of dog walking duration before and during the pandemic LD revealed no overall change ($p = 0.41$; median of 420 min per week). Interestingly, longer walk duration included owners aged 30–50 ($p = 0.001$) and over 50 ($p = 0.03$) compared to younger ones. In our study, the age factor was significant at the time before the LD but was no longer significant at the time of the LD.

In addition to the abovementioned working hours, factors that influenced the frequency of walking were whether the respondent lived in a house or an apartment and the number of people with whom they shared a household. These factors were signif-

icant both during and before the LD, which is in agreement with some other authors (Cutt et al., 2008; Richards, 2015; Westgarth et al., 2016).

The study by (Owczarczak-Garstecka et al., 2021) reports that the weekly frequency of dog walks during the LD was significantly reduced for owners living alone ($p = 0.04$) and those living with others ($p = 0.009$); in our study, this was not the case.

On the other hand, we found that at the time of the LD, the age of the respondents became a significant factor. However, the size of the population in their place of residence lost its significance. It is often stated in the literature that there is a difference in the frequency of walking according to the size of the population in the place of permanent residence (Koohsari et al., 2020). However, no difference associated with this factor was observed during the LD.

Our study also focused on the feelings associated with dog walking. The most significant findings could be the claims that dogs' presence provided respondents with distraction and social contact and reduced the feeling of loneliness. By contrast, they did not rate highly the statements about reducing their potential feelings of anxiety or sadness. In a study by (Ratschen et al., 2020), animal ownership compared with non-ownership was associated with smaller decreases in mental health and smaller increases in loneliness during the lockdown. These authors state that animal ownership seemed to mitigate some detrimental psychological effects of the Covid-19 lockdown.

In the abovementioned study, 96.4% of subjects agreed with the statement, "My animal keeps me fit and active in the Covid-19 situation". This concurs with the statement that was part of our study's interview. Also, it is an essential point for decreased PA, seen worldwide due to the pandemic. Getting some physical activity on the walks seemed to be the most significant benefit of dog walking. The highest value was rated by 53% of respondents and 4 points by 10% of respondents. 28% of respondents selected the middle value 3, while values 1 and 2 were chosen by 8.9%.

This was also connected to the possibility of maintaining a regular daily rhythm. A fact that is mentioned in other studies (Owczarczak-Garstecka et al., 2021) is that dog walking helps to maintain a regular order of the day. It is essential at a time when many people had to change their stereotypical schedule of the day entirely and suddenly had to create a new schedule when it was, in many cases, no longer necessary for them to come to work at a specified time.

Our results, as well as the results of other studies, show a significant change in dog walking trends. It would be interesting to find out whether the frequency and duration of dog walking after the end of the lockdown returned to the state before the Covid-19 pandemic. The time spent walking dogs contributes to the recommended daily activity and thus contributes to the overall health of dog owners. It is, therefore, necessary to map the current situation and possibly motivate and support dog owners to return to healthy rituals.

LIMITATIONS

The fact that the study was conducted through an online questionnaire survey when there was an effort to eliminate all possible personal contact caused differences in the age representation. However, the questionnaire was filled in upon social media contact, and its completion was voluntary and based on the respondents' interest.

Another limitation is that our sample consisted predominantly of female respondents, which could bring some bias. However, researchers commonly get most answers from females in many studies using questionnaires about animal-human interaction (Shoesmith et al., 2021).

Also, the sample size of the respondents is smaller, and it is, therefore, difficult to generalise the answers obtained. The obtained answers are thus valid for the group of respondents we examined. Another limitation is the submitted statements, from which the respondents could choose and to which they assigned values. The results might also differ if another wording had been chosen or left up to the responders. However, this is not possible due to the evaluation of respondents' answers and the quantification of data. In a future study, it might help to allow the respondents to indicate the exact time spent by dog walking rather than create approximate categories from which the respondent has to choose. A daily or weekly summary was used in different studies, while in our case, we recorded the average time of each walk. Future studies might also aim to incorporate objective measurements of walks, such as accelerometers or pedometers, which would provide additional information on the distance or intensity of the walk.

The other variable factors, like the intensity of the terrain, weather, and interactions with other people during the activity, had to be neglected in this study.

In addition to the information such as the age of the dog and its sports activities, gathering information on the breed of affiliation to an FCI group might also be interesting, as it could be one of the potential factors influencing the dog walking trends.

CONCLUSIONS

During the lockdown in the course of the Covid-19 pandemic, the frequency of dog walking decreased, and its duration increased. Factors associated with the dog walking frequency, such as age category or working time length, became newly significant. On the other hand, the size of the population in the place of permanent residence and with whom the respondents shared a household lost significance. The factors influencing the duration of dog walks before the lockdown were the respondents' age, the population's size at the place of permanent residence, and whether they lived in a house or an apartment. However, the age factor lost significance during the lockdown, and the other two factors remained significant.

This study brings a broad amount of data on current trends and changes in dog walking during the unprecedented lockdown, which might contribute to the organisation of public health or research methodology in future relatable situations. According to the respondents, dog walking motivated them to do the recommended daily activity and thus helped them maintain physical well-being. Also, the animal presence provided distraction and social contact and reduced their loneliness. These results imply that it might be essential to map the current situation to motivate and support dog owners to reintroduce healthy rituals into their lives.

For future studies, the authors recommend gathering data on the physical intensity of the walks while working with homogenous groups and exploring the individual factors mentioned above in more detail.

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Declaration of Interest statement
The author(s) declare no competing interests.

Data availability
Data are available on request.

Ethical statement
The Czech University of Life Sciences Prague Ethics Committee approved the study.

REFERENCES

Applebaum, J. W., Adams, B. L., Eliasson, M. N., Zsembik, B. A., & McDonald, S. E. (2020). How pets factor into healthcare decisions for Covid-19: A One Health perspective. *One Health*, *11*, 100176. https://doi.org/10.1016/j.onehlt.2020.100176.

Applebaum, J. W., Tomlinson, C. A., Matijczak, A., McDonald, S. E., & Zsembik, B. A. (2020). The concerns, difficulties, and stressors of caring for pets during Covid-19: Results from a large survey of US pet owners. *Animals*, *10*(10), 1882. https://doi.org/10.3390/ani10101882.

Bowen, J., García, E., Darder, P., Argüelles, J., & Fatjó, J. (2020). The effects of the Spanish Covid-19 lockdown on people, their pets, and the human-animal bond. *Journal of Veterinary Behavior*, *40*, 75–91. https://doi.org/10.1016/j.jveb.2020.05.013.

Coleman, K. J., Rosenberg, D. E., Conway, T. L., Sallis, J. F., Saelens, B. E., Frank, L. D., & Cain, K. (2008). Physical activity, weight status, and neighborhood characteristics of dog walkers. *Preventive Medicine*, *47*(3), 309–312. https://doi.org/10.1016/j.ypmed.2008.05.007.

Cutt, H., Giles-Corti, B., Knuiman, M., Timperio, A., & Bull, F. (2008). Understanding dog owners' increased levels of physical activity: Results from RESIDE. *American Journal of Public Health*, *98*(1), 66–69. https://doi.org/10.2105/AJPH.2006.103499.

Delanoeije, J. (2020). Furry families in times of Covid-19: Cats and dogs at the home-office. *The Work-Life Balance Bulletin: A DOP Publication*, *4*(1), 16–20.

Hallman, D. M., Januario, L. B., Mathiassen, S. E., Heiden, M., Svensson, S., & Bergström, G. (2021). Working from home during the Covid-19 outbreak in Sweden: Effects on 24-h time-use in office workers. *BMC public health*, *21*(1), 1–10. https://doi.org/10.1186/s12889-021-10582-6.

Ham, S. A., & Epping, J. (2006). Dog Walking and Physical Activity in the United States. *Preventing Chronic Disease*, *3*(2), A47.

Hoerster, K. D., Mayer, J. A., Sallis, J. F., Pizzi, N., Talley, S., Pichon, L. C., & Butler, D. A. (2011). Dog walking: Its association with physical activity guideline adherence and its correlates. *Preventive Medicine*, *52*(1), 33–38. https://doi.org/10.1016/j.ypmed.2010.10.011.

Christley, R. M., Murray, J. K., Anderson, K. L., Buckland, E. L., Casey, R. A., Harvey, N. D., Harris, L., Holland, K. E., McMillan, K. M., Mead, R., Owczarczak-Garstecka, S. C., & Upjohn, M. M. (2021). Impact of the First Covid-19 Lockdown on Management of Pet Dogs in the UK. *Animals*, *11*(1), Article 1. https://doi.org/10.3390/ani11010005.

Koohsari, M. J., Nakaya, T., McCormack, G. R., Shibata, A., Ishii, K., Yasunaga, A., Liao, Y., & Oka, K. (2020). Dog-walking in dense compact areas: The role of neighbourhood built environment. *Health & Place*, *61*, 102242. https://doi.org/10.1016/j.healthplace.2019.102242.

O'Sullivan, K., McGrane, A., Clark, S., & Marshall, K. (2020). Exploring the impact of home-schooling on the psychological well-being of Irish families during the novel coronavirus (Covid-19) pandemic: A qualitative study protocol. *International Journal of Qualitative Methods*, *19*, 1609406920980954. https://doi.org/10.1177/1609406920980954.

Owczarczak-Garstecka, S. C., Graham, T. M., Archer, D. C., & Westgarth, C. (2021). Dog Walking before and during the Covid-19 Pandemic Lockdown: Experiences of UK Dog Owners. *International Journal of Environmental Research and Public Health*, *18*(12), Article 12. https://doi.org/10.3390/ijerph18126315.

Powell, K. E., Paluch, A. E., & Blair, S. N. (2011). Physical activity for health: What kind? How much? How intense? On top of what? *Annual Review of Public Health*, *32*, 349–365. https://doi.org/10.1146/annurev-publhealth-031210-101151.

Ratschen, E., Shoesmith, E., Shahab, L., Silva, K., Kale, D., Toner, P., Reeve, C., & Mills, D. S. (2020). Human-animal relationships and interactions during the Covid-19 lockdown phase in the UK: Investigating links with mental health and loneliness. *PLOS ONE*, *15*(9), e0239397. https://doi.org/10.1371/journal.pone.0239397.

Richards, E. A. (2015). Prevalence of Dog Walking and Sociodemographic Characteristics of Dog Walkers in the U. S.: An Update from 2001. *American Journal of Health Behavior*, *39*(4), 500–506. https://doi.org/10.5993/AJHB.39.4.6.

Sakib, N., Bhuiyan, A. I., Hossain, S., Al Mamun, F., Hosen, I., Abdullah, A. H., Sarker, M. A., Mohiuddin, M. S., Rayhan, I., & Hossain, M. (2020). Psychometric validation of the Bangla Fear of Covid-19 Scale: Confirmatory factor analysis and Rasch analysis. *International Journal of Mental Health and Addiction*, 1–12. https://doi.org/10.1007/s11469-020-00289-x.

Shah, K., Kamrai, D., Mekala, H., Mann, B., Desai, K., & Patel, R. S. (2020). Focus on mental health during the coronavirus (Covid-19) pandemic: Applying learnings from the past outbreaks. *Cureus*, *12*(3). https://doi.org/10.7759/cureus.7405.

Shoesmith, E., Shahab, L., Kale, D., Mills, D. S., Reeve, C., Toner, P., Santos de Assis, L., & Ratschen, E. (2021). The influence of human – animal interactions on mental and physical health during the first Covid-19 lockdown phase in the UK: A qualitative exploration. *International Journal of Environmental Research and Public Health*, *18*(3), 976. https://doi.org/10.3390/ijerph18030976.

Westgarth, C., Knuiman, M., & Christian, H. E. (2016). Understanding how dogs encourage and motivate walking: Cross-sectional findings from RESIDE. *BMC Public Health*, *16*(1), 1019. https://doi.org/10.1186/s12889-016-3660-2.

White, R. L., Babic, M. J., Parker, P. D., Lubans, D. R., Astell-Burt, T., & Lonsdale, C. (2017). Domain-specific physical activity and mental health: A meta-analysis. *American Journal of Preventive Medicine*, *52*(5), 653–666. https://doi.org/10.1016/j.amepre.2016.12.008.

Xiao, Y., Becerik-Gerber, B., Lucas, G., & Roll, S. C. (2021). Impacts of working from home during Covid-19 pandemic on physical and mental well-being of office workstation users. *Journal of Occupational and Environmental Medicine*, *63*(3), 181. https://doi.org/10.1097/JOM.0000000000002097.

Young, J., Pritchard, R., Nottle, C., & Banwell, H. (2020). Pets, touch, and Covid-19: Health benefits from non-human touch through times of stress. *Jounal of Behavorial Economics for Policy*, *4*(2), 25–33.